REPUBLIC OF SIERRA LEONE
MINISTRY OF HEALTH AND SANITATION
DIRECTORATE DISEASE PREVENTION AND CONTROL

NATIONAL MALARIA CONTROL PROGRAMME

THE NATIONAL MALARIA CONTROL PROGRAM PERFORMANCE REVIEW

FINAL REPORT

April 2014

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Acronyms

ACTs	Artemisinin-based combination therapy
ACSM	Advocacy, Communication and Social Mobilization
ANC	Antenatal Clinic
ASAQ	Artesunate+Amodiaquine
BRAC	Bangladesh Agricultural Cooperation
BPEHS	Basic Package of Essential Health Services
CAWeC	Community Action for the Welfare of Children
CCMm	Community Case Management of Malaria
CF	Child Fund
CHA	Community Health Aide
CHO	Community Health Officer
CHW	Community Health Worker
DEC	Data Entry Clerk
DHMT	District Health Management Team
DMO	District Medical Officer
DMS	District Medical Stores
EHD	Environmental Health Division
EIR	Entomological Inoculation Rate
EPI	Expanded Programme on Immunization
FHADA	Food, Health and Agricultural Agency
GF	Global Fund
HFAC	Health for All Coalition
HIPC	Highly Indebted Poor Countries
HSC	Health Service Commission
HSCC	Health Sector Coordination Committee
IHSIP	Integrated Health Sector Investment Project
IHPAU	Integrated Health Project Administration Unit
IMNCI	Integrated mother Newborn and Child Illness
IPT	Intermittent Preventive Treatment
IRC	International Rescue Committee
IRS	Indoor Residual Spraying
ITNs	Insecticide Treated Nets
IVM	Integrated Vector Management
JPWF	Joint Programme of Work and Funding
LLINs	Long Lasting Insecticide Treated Nets
LMIS	Logistics Management Information System
LFA	Local Funding Agent
MCHA	Maternal and Child Health Aide
MDG	Millennium Development Goals
MIP	Malaria in Pregnancy
MOHS	Ministry of Health and Sanitation
MPR	Malaria Programme Review
MTEF	Medium Term Expenditure Framework
NEML	National Essential Medicines List
NGO	Non- governmental Organization
NHSSP-	National Health Sector Strategic Plan
NMCP	National Malaria Control Programme
NPPU	National Public Procurement Unit
PBF	Performance Based Financing
PHU	Peripheral Health Unit
PRSP	Poverty Reduction Strategy Paper

PBSL	Pharmacy Board of Sierra Leone
QA/QC	Quality Assurance and Quality Control
RBM	Roll back malaria-
RDT	Rapid Diagnostic Test
RFQ	Request for Quotations
SC	Save the Children
SECHN	State Enrolled Community Health Nurse
STG	Standard Treatment Guidelines
SWOT	Strength, Weakness, Opportunities, Threats
TBFF	Tony Blair Faith Foundation
TOR	Terms of References
UMC	United Methodist Church
UNOPS	United Nations Operations
WV	World Vision

Executive summary

The malaria programme review (MPR) is a periodic joint management process for assessing progress and performance of countriesô programmes with the aim of improving performance by refining and/or redefining the strategic direction and focus. The Executive Summary presents the major findings, key best practices, success stories and facilitating factors, as well as the main problems/ challenges, and critical actions emerging from the Sierra Leone MPR.

Key findings

The MPR highlights findings in seven thematic areas as follows: epidemiology; programme management; procurement and supply management; integrated vector management; case management; malaria in pregnancy; advocacy, communication and social mobilization; and surveillance, monitoring and evaluation and operational research.

Malaria Epidemiology

Malaria is endemic in Sierra Leone with all the population at risk with pregnant women and children under 5 years most vulnerable. *Anopheles gambiae* was first discovered as a vector of malaria in 1899 and still remains the predominant vector with a high proportion of *An. gambiaes.s. Plasmodium falciparum* is the dominant parasite responsible for all severe cases and over 90% of uncomplicated cases. However, there are also cases of malaria caused by *P. malariae* and *P. ovale* or a mix. Sierra Leone has two distinct malaria epidemiological strata: in two-thirds of the districts, malaria is characterised by seasonal peaks of transmission; in the other third, malaria transmission is stable year round.

According to Ministry of Health and Sanitation records, over 40% of outpatient morbidity for all age groups is due to malaria, and 47% in under-five children. It also accounts for 37.6% of all hospitalizations with a case fatality of 14.6%.Routine data on malaria cases and deaths is weak but available information indicates that they account for 25%of deaths in all ages and 38% among under-five children. The MIS 2013 reported the malaria prevalence rate of 46% in children aged 6-59 months based on Rapid Diagnostic Tests (RDTS) and 43% as measured by microscopy with the prevalence higher in rural areas (48%) than in urban areas (28%).

Action points

a) *Conduct entomological studies preferably after the mass campaign in 2014 and regularly thereafter.*
b) *Update the malaria stratification in Sierra Leone.*
c) *Strengthen use GIS for routine mapping of morbidity, mortality and intervention coverage for decision making.*

Malaria Programme Management and Leadership

The current Malaria Control Policy and National Strategic Plan were developed in 2010 followed by the development of guidelines and manuals in the key intervention areas. Technical Working Groups were created to ensure coordination and follow-up of the implementation of interventions at district and community levels. The MPR noted that a partnership was built to support the NMCP and the Health authorities culminating into the success in securing the Global Fund Round 10 grant following after the Rounds 4 and 7 grants.

Despite the strong malaria control leadership and open-door interaction with stakeholders, several issues remain: funding is largely donor-dependent and inadequate to sustain interventions including the malaria free treatment for the entire population declared in 2012; there is low/no reporting from the private sector; weak collaboration with other vector-borne disease programmes; and inadequate compliance and weak enforcement of policies and guidelines.

Action points

a) *Increase and sustain government's contribution to the funding of malaria control in Sierra Leone.*
b) *Prioritize malaria control activities in the Local Council District Plans and hospital plans*
c) *Ensure the oversight function of the malaria national technical working group and subcommittees.*
d) *Strengthen coordination of the RBM partners at national and district levels.*
e) *Increase the involvement of non-profit and private-for-profit institutions, and hospitals (public and private).*
f) *Strengthen the capacity of the District Health Management Teams to coordinate and supervise service delivery including malaria control.*
g) *Integrate malaria prevention and control in the curriculum for pre-service training institutions and provide the necessary support as required.*

Procurement and Supply Management

The MOHS and partners have updated guidelines relating to procurement and supply management, and developed SOPs and tools for Logistics Management Information System (LMIS) including a computer software CHANNEL and Procurement and Supply Management Plan. A Risk Mitigation Matrix for commodity distribution to prevent óleakagesô was also developed.

Currently, malaria commodities financed by the GF are procured through the VPP mechanism. It is expected that this arrangement will continue until the NPPU is approved by the GF to take over the procurement of commodities for the GF grant. A recent GF Portfolio Analysis in 2012 reported that the percentage of health facilities reporting óNo Stock-Outô of ACTs and RDTs were 96% and 95.3% respectively, consistent with the reported HMIS data.The GOSL with the support of its development partners, mainly UNICEF, has set up a National Pharmaceutical Procurement Unit (NPPU) in April 2013 to establish an integrated cost-effective system for the procurement and distribution of all health commodities based on globally recognised standards.

However, the review noted that there are delays in clearing of commodities at the ports, resulting in artificial shortages; and inadequate and poor storage facilities. Sierra Leone has weak Quality Assurance and Quality Control (QA/QC) systems for malaria medicines and diagnostic materials. Also there is incomplete and delayed reporting of LMIS data especially at secondary and tertiary levels.

Action points

a) *Strengthen the integration of the NMCP procurement processes with CMS/NPPU.*
b) *Build new and renovate storage facilities at national and district levels.*

c) *Strengthen QA/QC system including field supervision and linkage with an External Quality Assurance programme.*
d) *Strengthen the LMIS for effective monitoring of service and quantification of commodities.*

Integrated Vector Management

The malaria programme conducted two rounds of mass distribution campaigns of ITNs/LLINs in 2006 and 2010. In 2010, a total of 3,264,927 LLINs were distributed for scale-up to achieve the universal coverage in keeping with the global recommendations and resulted in 98.6% administrative coverage. The campaigns were complimented with routine distribution mechanisms such as the IMNCH weeks, ANC and EPI clinics. This achievement has been made possible by the strong leadership role played by the GOSL, supported by its partners. Importantly, funding for the net cost for LLIN mass campaign to achieve universal coverage to be conducted in 2014, has been secured. Additional financial support is needed for the non - net cost to successfully achieve the expected outcome of the integrated LLIN mass campaign. In addition, an indoor residual spraying (IRS) pilot was implemented in four (4) districts achieving coverage of 97% operational coverage in the targeted areas in 2010-2011 and 2012.

However, policies and guidelines for integrated vector management require update to reflect WHO recommendations. There is poor coordination and collaboration of partners for vector control and the national Technical Working Group is not functional. The review noted that there were stock-outs of LLINs for routine distribution. Although there is high (61.5%) coverage of ownership of LLINs at household level, the proportion of children under five years using LLINs is 69.2% (below the Universal Coverage target of 80%). Also there is absence of insecticide resistance monitoring in the presence of large scale use of insecticides for malaria control. Additionally, Sierra Leone has limited entomological data.

Action points

a) *Review/update policy and guidelines for integrated vector management*
b) *Strengthen the oversight role of the IVM subcommittee on the activities of NGOs, FBOs, and private organizations in malaria vector control*
c) *Strengthen routine LLINs distribution system to maintain universal coverage*
d) *Establish entomological and insecticide resistance monitoring system*

Malaria Case Management

The Malaria Control Policy has adopted testing of all suspected malaria cases before treatment, and the use of ACTs to treat uncomplicated malaria cases. Up to 6,515 Community Health Workers (CHWs) were trained in the case management of malaria and the use of RDTs at community level in 2013. The GOSL has instituted the Free Health Care Package (including malaria) for under-fives, pregnant women and lactating mothers. The package makes exception of malaria where all ages are guaranteed free malaria case management. The private sector is also heavily involved in malaria case management.

However, some hospitals (public and private) and privately-run clinics do not comply with the policies and guidelines on management of malaria. There is inadequate capacity at hospital level for the management of severe malaria. Rapid Diagnostic Test (RDT) kits have not yet been supplied for community management of malaria to all trained CHWs. There is inadequate supervision of health workers and the provision of health services. In addition,

there were reports of high attrition of CHWs who are essentially volunteers.There is low level of pharmacovigilance.

Action points

a) Strengthen the compliance of all stakeholders to national policies and guidelines.
b) Build human resource capacity and infrastructure for QA/QC system for malaria diagnosis and treatment.
c) Ensure regular supply of RDTs for community case management of malaria.
d) Strengthen and conduct regular supportive supervision and mentoring, particularly of CHWs on malaria case management
e) Develop innovative and practical approaches for motivation and retention of CHWs
f) Improve pharmacovigilance of anti-malaria medicines.

Malaria in Pregnancy

The NMCP has a strategy for prevention and control of Malaria in Pregnancy (MIP) and has been rolled out in the country. MIP is integrated with Reproductive Health services of the Ministry of Health and Sanitation. Intermittent Preventive Treatment of malaria in pregnancy (IPTp) is also implemented at community level.

However, the policy and guidelines on IPTp require update to reflect the 2012 WHO recommendation on number of SP doses. Although malaria in pregnancy is a critical intervention, there were reports of stock-outs due to problems with upstream supply chain.The involvement of private health providers as well as public hospitals is limited.Also there is inadequate monitoring and supervision of IPTp at community level.

Action Points

a) Review and update of MIP policy and guidelines.
b) Ensure continuous availability of MIP drugs.
c) Strengthen the provision of MIP by hospitals and private sector institutions.
d) Strengthen monitoring and supervision of MIP activities at all levels.

Advocacy, Communication and Social Mobilization (ACSM)

Guidelines and a framework for implementing behaviour change communication at all levels in Sierra Leone, notably the National Malaria Behaviour Change Communication Strategy 2009-2013. The presence of several partners and funding from the Global Fund, has contributed significantly to this effort. Findings from national surveys including the KAP 2012, NDHS 2008 and MIS 2010 indicate a high level of awareness of malaria prevention and control at community level. Despite these achievements, interventions are not translating to improved practice.

Action Points

a) Strengthen coordination and engagement of potential partners
b) Ensure quality of delivery of interventions and periodic evaluation including barrier analysis.
c) Scale-up capacity building at all levels for behavior change communication

Surveillance, Monitoring and Evaluation and Operational Research

The NMCP has a Monitoring and Evaluation Plan aligned with the current National Malaria Strategic Plan. As at 2011, malaria data collection and reporting tools have been integrated into the HMIS. The programme relies on the recent DHIS2 with a customized malaria module and uses the available national integrated supervisory checklist. Annual review and planning meeting are also held and an annual report is prepared and shared. To assist in reporting data and other events to the DHMT PHUs have phones. All districts have Disease Surveillance Officers as well as Malaria Focal Points. The NMCP has coverage and impact data from various surveys. Also therapeutic efficacy tests are consistently conducted and the results have been used for policy formulation.

However, other players in malaria control continue to report vertically, by-passing the government system. Supervision, monitoring and evaluation of activities are uncoordinated and irregular mainly at district level. DHMTs lack backup systems for data; and analysis is not usually done for local use. There is frequent breakdown of the DHIS2 at district level. There is also poor data collection and documentation at hospital level coupled with lack of reporting tools and qualified health information personnel. The oversight function of the district over NGO-run health facilities was inadequate. Nationally, there is no malaria research agenda and there is limited local capacity in malaria research for use by the NMCP.

Actions Points

1) *MOHS should strengthen the logistics support to supervision of hospitals and the supervision of PHUs by DHMTs.*
2) *The M&E team should review the key processes to standardize analysis (including mapping) and use of collected and collated data at district level.*
3) *MOHS should ensure regular maintenance of the DHIS system.*
4) *Strengthen the staffing capacity for health information at hospital levels.*
5) *Develop, share and regularly review the malaria research agenda.*

Conclusion

Sierra Leone Malaria Programme Performance review has provided important findings regarding the epidemiology of malaria, the strategic framework, partnersô involvement and strategies for delivery of interventions. It has identified key issues affecting performance, and has highlighted the need for increased focus on strategic directions for future program planning, design and delivery, particularly the need to increase national funding to ensure improved sustainability of the Programme.

1. Introduction

1.1 Background

Sierra Leone is located on the West Coast of Africa, between latitude 8 30º north and longitude 11 ï 30º west. It is bounded by Guinea on the North and East, and Liberia on the South ï East. The Atlantic Ocean forms a beautiful coastline to the south and west of the country.

Sierra Leone covers a total area of 71,740 km^2 (27,699 sq. ml) with a coastline of 402 km. It has a maritime claim of territorial sea equivalent to 200 nautical miles (370.4 km; 230.2 miles). Sierra Leoneôs continental shelf is 200 metres in depth. The projected population for 2014 is 6,348,350 with 57.5% [1]of the population living in the rural areas.

The country has a varied terrain, ranging from coastline swamps, through inland swamps and rain forest to one of the highest mountains in West Africa, the Bintumani at 2200m. The secondary palm-bush is the main vegetation and it is interspersed with numerous swamps that are mostly cultivated for rice. These swamps provide ideal breeding places for the Anopheline vectors of malaria. The coastal line of the country has several mangrove swamps, which provide the breeding sites for *Anopheles melas* mosquitoes, which is one of the major vectors of malaria besides *Anopheles gambiae* and *Anopheles funestus*.

The country has a typical tropical climate with temperature ranging from 21ºC to 32ºC with a mean daily temperature of 25ºC. It has two major seasons; wet season (May to October) and the dry season (November to April) with heavy rains in July/

Sierra Leone is a democratic state with a presidency, cabinet, parliament and an independent judiciary. Sierra Leone has four regions one of which is the Western area which is divided into Urban and rural. The other regions are the North, South and Eastern regions. There are also thirteen districts, nineteen councils and 149 chiefdoms.

Figure 1: Map of Sierra Leone

Source: National Malaria Control Strategic Plan, 2011-2015

Statistics Sierra Leone, the statistics bureau of Sierra Leone estimates the population as 6,188,349 (2013). The capital city Freetown, with an estimated population of 1,070,200, is the largest city and serves as the economic, commercial, educational and cultural centre of the country. Bo, to the Southeast part of the capital, is the second largest city with an estimated population of 245,867. Other cities/towns with estimated population of over 100,000 people are Kenema, 207,778, and Makeni. 122,755 to name a few.

Sierra Leone has a youthful population with women of child bearing age accounting for 24% and 41.7% of young children. This projection shows that a large number of young people will eventually continue to enter the working age and become economically active. The urbanisation levels will therefore continue to increase.
The literacy rate is less than 40%. More than half of the population lives below the international poverty line on less than US$1 a day. The economy however, is making a slow but steady recovery.

Allocation for health in the National budget is less than 15% and government allocation to the National Malaria Control Programme is 0.3% (NMCP-SP). However, the Malaria Programme gets support from other partners that are supporting poverty alleviation in the country and they include:

- National Commission for Social Action (NaCSA)
- Social Action for Poverty Alleviation (SAPA)
- International Monetary Fund (IMF) approved an economic programme in the context of the Emergency Post Conflict Assistance Facility in December 1999.
- The World Bankôs Economic Rehabilitation and Recovery Credit to assist Government in restoring protective and economic security,
- The Integrated Health Sector Investment Project (IHSIP) has metamorphosed into Health Sector Reconstruction and Development Project.

Since the first strategic plan (2004-2008) was developed, new and effective interventions such as treating uncomplicated malaria with Artemisinin-Based Therapy (ACT), malaria prevention in pregnancy through the use of Sulfadoxine-Pyrimethamine (SP), and indoor residual spraying (IRS) had emerged. The Abuja declaration of May 2006 which was aimed at achieving and sustaining universal access to appropriate interventions for all populations that are at risk of malaria was declared. Sierra Leone subscribes to the global MDGs and Abuja targets to reduce malaria morbidity and mortality and therefore reduce human suffering, socio-economic loss and promote economic development (NMCP-SP). In 2010, the policy was revised to make provision for other alternatives to replace Artesunate Amodiaquine for the management of uncomplicated malaria. It was therefore recommended that the use of quinine and Artemether injections for the treatment of severe malaria and Sulphadoxine-Pyrimethamine for intermittent preventive treatment in pregnancy be used. Therefore, there was need to develop a second strategic plan which could take care of these new developments. Hence the development of the National Malaria Control Programme Strategic Plan (2011- 2015).

The strategic plan is aimed at reducing the current levels of malaria morbidity by 50% and reducing mortality by 25% by 2015 through:

- Promoting, co-ordinating and supporting the delivery of effective malaria control interventions that will prevent and reduce morbidity, mortality and disability due to malaria and its socio-economic consequences;
- Using new technologies available to produce results and implement improved diagnosis and ensure rapid and prompt treatment for malaria and establish selective malaria vector control activities;
- Developing decentralized multi-sectorial harmonious partnerships in malaria control activities in Sierra Leone from national up to community level. (NMCP strategic plan 2010-2015)
- Strengthening management and implementation capacity of the National Malaria Control Programme through effective coordination of partners.
- Strengthening surveillance, monitoring, evaluation and operational research for effective programme management.

Justification for the Malaria Programme Review (MPR)

Since the development of the second National Malaria Strategic Plan (2011-2015) there has been only one review, it is therefore important that national malaria programme review (MPR) which is a periodic joint programme management process for reviewing progress and performance of countryôs programmes within the national health and development agenda be done with the aim of improving performance and/or redefining the strategic direction to focus and strengthen program delivery structures and systems.

1.2 Objectives of the MPR

The purpose of this review is to ascertain the current malaria epidemiology with regards to the disease burden and trends, carry out a revised stratification and create a framework for strategic revision in order to attain the Millennium Development Goals (MDGs) in the light of the changing environment and new trends and development in malaria control.

The specific objectives

- To review the malaria epidemiology (endemicity, seasonality, parasite prevalence, vector situation,) of the country.
- To review the policy and programming framework of the country within the context of the health system and the national development agenda (programme organization, structure and management)
- To assess progress made towards the achievement of 2010 and 2015 RBM and MDG goals and targets.
- To assess progress towards the achievement of the Strategic Plan targets.
- To assess the organization, internal and external partnerships, and the areas of funding for malaria control.
- To review the current program service delivery systems, their performance and their challenges.
- To define the next steps for improving programme performance or redefining the strategic direction and focus, including revising the policies and strategic plans.

1.3 Methodology of the MPR

The malaria program review **(MPR)** was conducted in four phases with specific steps.

Phase One: Planning and Preparation

The first phase of planning started in Feb/March 2013. During this phase, there were consultation meetings with stakeholders to define the need for the review and to develop terms of references (ToRs). Different structures of the MPR were put in place. These were; i) Nomination of one MPR Coordinator; ii) Nomination of the secretariat of the MPR; iii) Recruitment of a national consultant; iv) Forming of 7 thematic desk review groups which were multi sectorial with health workers, research institutes, and NGOs. The plan and budget were developed and submitted to the RBM, the Malaria Unit and other partners for funding. Meanwhile a technical assistance request was sent to WHO/IST ï West Africa.

Phase Two: Thematic Desk Reviews

The second phase started in September, 2013 and ended in October, 2013. This phase involved selecting tools for the field review and conducting thematic desk reviews. Thematic review groups were meeting regularly and all existing documents were found and filed at the Malaria Unit and shared with all partners. A checklist was developed to track activities and updated gradually as need arose. This desk review consisted of a summary of recent progress in achieving set targets for access, coverage, quality, use and impact. It allowed the program to identify best practices, recognize problems, determine the priority of those problems, decide on how to investigate those of highest priority and propose appropriate solutions. This phase revealed information weaknesses and gaps and therefore where the external review process would focus.

Phase Three: Field Review

The third phase was done according to the guidelines and it involved briefing of external review team. This ensured team-building between internal and external review teams, consensus-building on findings of thematic internal desk review, familiarization with data collection tools for field visits, briefing and formation of field teams for field review. The field visits started from 4th-6th October 2013 with central level, visits to national institutions and organizations and concurrently other teams undertook district and community field visits to malaria service delivery points. Later, teams re-converged and shared field reports through plenary presentations on key findings.

The information from the thematic review reports were updated to ensure completeness. Thereafter, the preparation of drafts of the final report, executive summary, aide-memoire and slide presentation of key findings and recommendations were done. The aide-memoire and a summary of the key findings and recommendations were presented to the Honourable Minister of Health by the external review team. The aide memoire was circulated to stakeholders for study and comment. This phase ended in October.

Phase 4: Follow-Up

Phase four officially started from 2013 and will involve the following key actions:

1. Finalize and publish the report.
2. Disseminate the report.
3. Implement the recommendations.

4. Monitor implementation of the recommendations.
5. Update policies and plans and redesign the programme, if necessary.

1.4 Outline of the document

The document begins by describing the context of malaria control in Sierra Leone. It is followed by chapters according to the thematic areas identified for the MPR: epidemiology, programme management; procurement and supply chain management; vector control; diagnosis and case management; malaria in pregnancy; advocacy, information, education, communication and social mobilization; surveillance, monitoring, evaluation and operational research; and malaria burden and financial management.

Each chapter describes the current situation in the country, policy and guidance framework for the thematic area, key activities in place, achievements, best practices, problems or challenges and lessons learnt as well as recommendations for the way forward.

2. Context of Malaria Control

2.1 Historical milestones in malaria control

Malaria affects the health and wealth of nations and individuals alike. In Africa today, malaria is understood to be both a disease of poverty and a cause of poverty. Malaria has significant measurable direct and indirect costs, and has been shown to be a major constraint to economic development. For developing economies this has meant that the gap in prosperity between malaria has become wider every single year.

Annual economic growth in countries with high malaria transmission has historically been lower than in countries without malaria. Economists believe that malaria is responsible for a ógrowth penaltyô of up to 1.3% per year in some African countries. When compounded over the years, this penalty leads to substantial differences in GDP between countries with and without malaria and severely restrains the economic growth of the entire region.

The connection between malaria and mosquitoes was suspected from ancient times. One of the oldest scripts, written several thousand years ago in cuneiform script on clay tablets, attributed malaria to Nergal, the Babylonian god of destruction and pestilence, pictured as a double-winged, mosquito-like insect. A few centuries later, the natives told Philistines settling in Canaan, on the eastern shore of the Mediterranean, of the god Beelzebub, lord of the insects. The evil reputation of this deity increased through the ages until the early Jews named him "Prince of the Devils."

The ancient Hindus were also conscious of the mosquito's harmful potential. In 800 B.C. the Indian sage Dhanvantari wrote about the diseases caused by bites of the mosquitoes. *Susrutha Samhita* also mentions about a possible link between fevers and insects like mosquitoes.
Hippocrates, Greek Physician in 400 BC, attributed malaria to ingestion of stagnant water; also related the fever to the time of the year and to where the patients lived.
Use of mosquito nets has been dated to prehistoric times. It is said that Cleopatra, Queen of Egypt, also slept under a mosquito net.

So conscious were the ancient Romans of the association between mosquitoes and malaria that city officials would routinely prohibit human habitation in mosquito-infested districts. To protect themselves from the notorious Campagna mosquitoes, shepherds returning from a summer in the Apennines furnished their small cabins with a few sheep to satisfy the ravenous insects, thereby hoping to avoid malaria. The association with stagnant waters (breeding grounds for *Anopheles*) led the Romans to begin drainage programs, the first intervention against malaria.

In Britain, the 'Roman technology' of draining swamps protected some areas from malaria during this time. Italian physician Lancisi in 1717 had suggested a possible role for mosquitoes in transmission of malaria and proposed the draining of marshes to eradicate malaria.

Malaria's decline in the United States and Europe in the late 1800s was due mainly to draining swamps and removing mill ponds. Improved housing, isolation of sick people in mosquito-

proof areas, better access to health care and medication, and improved nutrition, sanitation, and hygiene all may have reduced transmission and/or mortality rates.

In 1882, Albert Freeman Africanus King (1841-1915), a US Physician, proposed a method to eradicate malaria from Washington, DC. He suggested to encircle the city with a wire screen as high as the Washington Monument. Although many people took this as a jest, his hypothesis to link mosquitoes with malaria transmission was proved five years later.

Major Roland Ross in 1897 discovered that, human malarial parasites were first observed in wild-caught Anopheles gambiae and An. funestus, the principal vectors of malaria in Africa. This opened a new chapter in malaria control. With his brilliant research, he did not only identified the habits and habitats of these mosquitoes but also proposed detailed plan of action to contain their breeding. Ronald Ross did not stop at writing about malaria control either. He stood at the vanguard of implementing his ideas till his end. Ross attempted to eradicate malaria from England by forming ómosquito brigadesô to eliminate mosquito larvae from stagnant pools and marshes. In 1899, he was sent to Freetown, the capital of Sierra Leone (which became known as the 'White Man's Grave' in the 19th century largely because of the high malaria-related mortality amongst Europeans living there) where he organised a sanitation drive, clearing the streets of tyres, bottles and empty cans and levelling roads so that rain water would not gather into puddles. But the Freetown malaria control programme did not yield desired results, probably because Ross had underestimated the number of breeding pools and the sheer number of vectors that he was trying to control. Ross had very limited funding and the best available technology was to pour oil on the numerous breeding sites around Freetown. As soon as the oil treatments stopped, breeding would begin again. Ross redoubled his efforts with increased funding from private sources and ensured the removal of all potential breeding sites, including rubbish, broken bottles and other potential water containers. Despite these concerted efforts, the programme was remembered more for its impact on the Freetownôs rubbish than with malaria control. J.W.W. Stephens and S.R. Christophers, who had worked with Ronald Ross in Freetown, organised a similar drive in Mian Mir in Lahore, India in 1901, without much success.

The establishment of a field laboratory for the Liverpool School of Tropical Medicine in Freetown in 1920 made Sierra Leone the centre for malaria field research in Africa up to and during the Second World War. Eminent Malariologists including Ronald Ross, Samuel Christophers, George Macdonald, Leonard Bruce-Chwatt, Brian Maegraith, Ian Macgregor, Brian Greenwood and Michael Service visited Sierra Leone for malaria-related activities.
Tremendous efforts were made towards defining the epidemiological picture of the disease and the most effective means of combating it over the past 100 years. Malaria control in Sierra Leone, as in many other parts of the world, used to be based largely on mosquito eradication. However, experience gained over the past 100 years has shown that mosquito control is often not cost-effective in areas where the interruption of transmission cannot be sustained.

From the early 1970's the malaria situation has slowly and progressively deteriorated globally. The concept of eradication was replaced with that of control as a part of primary health care. Reduced control measures between 1972 and 1976 due to financial constraints lead to a

massive 2-3 fold increase in cases globally. Spraying never truly eradicated the mosquitoes anywhere, and the reduction in the more persistent *P. vivax* infections were much less than for *P. falciparum* - though the latter returned in much greater strength as control measures waned

Malaria control in the 1980s was neglected in many areas. The optimism of the eradication campaign was replaced by a belief that malaria could not be controlled. The systems set up for eradication, which were very centrally organised and directed were discredited, and support was withheld without offering alternative systems and strategies. Whilst it was said that malaria control should be integrated into the general health systems, instead of being a vertical programme, the means to do this were neglected. At the end of the 1980s and in the early 1990s the World Health Organisation (WHO) worked with all malarious countries to develop a global strategy for malaria control. This strategy was adopted by a Global Ministerial Conference on Malaria in Amsterdam in 1992. The strategy has four elements:

- To provide early diagnosis and prompt treatment;
- To plan and implement selective and sustainable preventive measures, including vector control;
- To detect early, contain or prevent epidemics;
- To strengthen local capacities in basic and applied research.

The strategy was widely endorsed, and efforts to implement it have shaped the development of malaria control in most malarious countries. It has been adapted to the needs of different regions; in Africa, for instance, a Regional Malaria Control Strategy for 1996 to 2001 was developed by a Task Force for Malaria Control convened by the WHO African Regional Office (AFRO).

In 1998 Dr. Gro Harlem Brundtland, Director General, World Health Organization launched a Global Roll Back Malaria Initiative against malaria. The RBM Strategy included early case detection and prompt treatment, integrated vector management and Containment of focal epidemics

The Ministry of Health and Sanitation with technical support from WHO established the National Malaria Control programme within the Directorate of disease prevention and control in 1994 because of the high incidence of morbidity found in various outpatient records.

Since 1998, Sierra Leone committed itself to the Roll Back Malaria (RBM) Initiative, which builds on the Global Malaria Strategy with a focus on Africa. On April 25, 2000, at the Abuja Summit in Nigeria, the Roll Back Malaria (RBM) Partnership and African Health Ministers set targets of exceeding 80% coverage for the interventions by 2015.

Sierra Leone is a signatory of the 25th April 2000, the African Heads of State Abuja Declaration, on the roll Back malaria initiative and its plan of action. The goal of the Roll Back Malaria Initiative was to halve the world's malaria burden by 2010.

Sierra Leone subscribes to the global MDGs and Abuja targets to reduce malaria morbidity and mortality and therefore reduce human suffering, socio-economic loss and promote economic development.

Sierra Leone has increased resources to health and malaria following the Abuja political commitment.

Consequently the country drew a National Health Policy (MoHS 2002), which considered malaria control as a key priority. It also committed itself to the Abuja Declaration on Roll Back Malaria in Africa, which similarly seeks to achieve specific targets on malaria prevention and control with time limits. [National Strategic Plan for Malaria Control (MoHS, 2004-2008, 2010-2015].

Unfortunately, the various control measures undertaken over the years met with limited success mainly due to a number of factors including focus on single strategies, support to selected districts, inadequate funding, poor human resource capacity and low involvement of NGOs, civil society and other stakeholders.

New national strategic malaria control plan was therefore developed (2004-2008) in 2004 based on RBM principles of multiple interventions, involvement of all stakeholders and evidence-based interventions. Key interventions promoted in the new RBM Plan included promoting home-based care, use of Insecticide Treated Nets (ITN)/Long Lasting Insecticide Nets (LLIN), improving case management in health facilities and use of appropriate chemoprophylaxis in pregnancy. Initially, implementation of most of these interventions was limited mainly to the national level due to lack of funds and capacity to move to scale.

Sierra Leone has received two previous GF grants for malaria in support of its efforts to reduce the malaria burden in the country. Some funds were therefore mobilized in 2004 from the Global Fund (Round 4) focused on strengthening malaria control interventions in 8 out of the 13 districts, but operated for only for phase 1 of the grant. Round 7 Malaria, which began in 2008, focused on further expansion of LLINs and ACTs to the vulnerable groups of pregnant women and children less than five years old. The emphasis of the proposal was scaling up Home Management of Malaria (HMM), which is now referred to as Community Case Management of Malaria (CCMm). While previous grants have been for specific districts (Round 4) or target groups such as children under 5 and pregnant women (Round 7), Round 10 provides the entire population of Sierra Leone with access to effective malaria control interventions, building on the work of the previous grants.

The Ministry of Health and Sanitation and partners conducted a study on Chloroquine (CQ), Sulfadoxine-Pyrimethamine (SP), and Amodiaquine (AQ) in selected districts which was validated by WHO and MoHS in July 2003.

Based on the validated drug efficacy results, a decision was taken to adopt the use of ACTs as the drug of choice for the management of uncomplicated malaria and to review the then current anti ï malarial treatment policy.

The revised policy made provision the use of injectable quinine for the treatment of severe malaria and Sulphadoxine-Pyrimethamine for intermittent preventive treatment in pregnancy.

In December, 2010, the Anti-Malaria Drug Policy was again revised based on current evidence on malaria treatment (especially fresh evidence that injection Artesunate is an

alternate to injection quinine in managing severe malaria and WHOôs recommendation for its use in preference to quinine) and lessons learnt in the implementation of the previous policy.

In 2010, under WHO supervision, Indoor Residual Spraying (IRS) is currently being piloted in four districts as a complimentary activity to LLIN promotion. Based on the results of this pilot, funding will be sourced to scale up IVM nationwide by the public and the private sector.

2.2 Malaria control within the national development agenda

Malaria has a priority place in the development agenda of Sierra Leone. The National Malaria Control Programme (NMCP) is strategically placed within the Directorate of Disease Prevention and Control in the Ministry of Health. It has a well-established national coordinating body with malaria technical Working Groups providing planning and implementation technical support. The program has a number of steady and long term partners who provide technical assistance and funding for malaria interventions.

The health sector is currently implementing its first National Health Sector Strategic Plan (NHSSP) (2010-2015) and first Joint Programme of Work and Funding (JPWF) (2012 2014). Having a Functional national health systems delivering efficient, high quality health care services that are accessible, equitable and affordable for everybody in Sierra Leone is the **Vision** of the sector. The **mission** of the health sector is to contribute to socio-economic development by promoting health and ensuring access to quality health, population and nutrition services by the population of Sierra Leone through effectively functioning national health systems. The ultimate **goal** of the sector is to reduce inequalities and improve the health of the people, especially mothers and children, through strengthening national health systems to enhance health related outcomes and impact indicators. This goal translates the overall mission and vision of the National Health Policy into policy objectives that are in line with the ñAgenda for Changeò, the Ouagadougou Declaration and the MDGs. The **general objective** is to strengthen the functions of the national health system of Sierra Leone so as to improve the following performance criteria: -

1. Access to health services (availability, utilisation and timeliness)
2. Quality of health services (safety, efficacy and integration)
3. Equity in health services (disadvantaged groups)
4. Efficiency of service delivery (value for resources)
5. Inclusiveness (partnerships)

The objectives for the NHSSP are thus given under the following 6 building blocks.

1. Governance
2. Services delivery
3. Human Resources
4. Health Financing
5. Medical Products and Technologies
6. Health Information

Sierra Leone in 2000 participated in the African Development Forum in Abuja and signed and implemented the Abuja Declaration on HIV/AIDS, TB, Malaria and other Infectious Diseases. The HIPC (Highly Indebted Poor Countries) initiative of the government [GOG

HIPC Initiative 2004], which targeted the poor and vulnerable groups, made provision for subsidies and exemptions for certain types of services including provision of LLINs, free treatment for vulnerable groups (pregnant women, children, the aged) and the poor. The Government of Sierra Leone is currently scaling up the Primary Health Care intervention strategies which involve placing trained community health officers [Community Health Workers (CHOs), State Enrolled Community Health Nurses (SECHNs), Maternal and Child Health Aides (MCHAs), Community Health Assistants (CHAs) and Community Health Workers (CHWs); Community Based Providers (CBPs) and Traditional Birth Attendants (TBAs)] in communities to provide a package of basic essential health care services, including malaria prevention and control.

The first Poverty Reduction Strategy Paper (PRSP) (2004 to 2007) presented a programme for food security, job creation and good governance. Poverty was high as a result of the increase in prevalence of diseases like HIV/AIDS, malaria and tuberculosis. Sierra Leone then found herself at the bottom of the 2004 UNDP

Human Development Index

PRSP 1 had one important policy area which was aimed at óequitable access to affordable basic services with the aim of improving quality services especially to the poor and vulnerableô. The paper also focused on ensuring improved services in MCH, Malaria and communicable diseases and the need to strengthening Primary, Secondary and Tertiary services that will support the basic levels was also stressed. The governmentôs major focus on PRSP 2-(2008-2012) was on reducing mortality especially for infants and pregnant women. The government supported the scaling up the minimum package of essential services, including immunization, utilization of treated bed nets.

The Government of the Republic of Sierra Leone has shown much commitment to the needs of women and children and the vulnerable group members in the society including the poor.
Sierra Leone has also assented to various WHO and World Health Assembly resolutions including ñRBM in the African Region: A Framework for Implementationò (AFR/RC50/12).
In an effort to strengthen malaria control and prevention the Government of Sierra Leone waived taxes and tariffs on antimalarial medicines, ITNs leading to increased uptake through ITN outlets in the private sector. Taxes and tariffs were also waived on Insecticides, spray equipment and diagnostics.

The introduction of the government-led free healthcare initiative in April 2010 for pregnant women, lactating mothers and children under five followed by the introduction of free testing and treatment for malaria for all age groups in April 2012 led to an increase in public health facilitiesô attendance especially for children under 5 years of age.

National level

The core functions of the central level MoHS headquarters are:

a) Policy analysis, formulation and dialogue;
b) Strategic planning;
c) Setting standards and quality assurance;
d) Resource mobilization;

e) Advising other ministries, departments and agencies on health-related matters;
f) Capacity development and technical support supervision;
g) Provision of nationally coordinated services including health emergency preparedness and response and epidemic prevention and control;
h) Coordination of health research; and
i) Monitoring and evaluation of the overall health sector performance.

Several functions have been delegated to national autonomous institutions such as National Pharmaceutical Procurement Unit (NPPU), National Public Health Reference Laboratories, regulatory authorities such as various professional councils, Sierra Leone Medical and Dental Council, Sierra Leone Nurses and Midwife Board and the Pharmacy Board of Sierra Leone, etc.

The Health Service Commission (HSC) is responsible for the recruitment, deployment, promotion and management of Human Resource for Health (HRH) on behalf of the Human Resource Management Office (HRMO)

District Level

Local Government Act 2004 mandates the District Local Councils to plan, budget and implement health policies and health sector plans. The Local Governments have the responsibility for the delivery of health services including passing of health related by-laws and monitoring of overall health sector performance. These Local Councils manage public general hospitals and health centres and also provide supervision and monitoring of all health activities (including those in the private sector) in their respective areas of responsibility. The public private partnership at district level is however still weak.

2.3 National health policy

National health policy was written in 1993 on the basis of set criteria, (the severity of the disease in terms of its contribution to the overall burden of disease in the country, the distribution of the health problem within the country as a national problem, the feasibility and cost-effectiveness of interventions concerning the health problem, public expectations concerning the problem, compliance with international regulations, the current national priority health problems are:

- Malaria;
- Sexually Transmitted Infections including HIV/AIDS;
- TB;
- Unsatisfactory reproductive health including maternal and neo-natal mortality;
- Acute Respiratory Infections;
- Childhood immunisable diseases;
- Nutrition-related disease;
- Water, food and sanitation-borne diseases;
- Disability;
- Mental illness

Policy for Community Health Workers in Sierra Leone – June 2012

In Sierra Leone, the shortage of key health care workers is being addressed by innovative strategies such as the development of alternative cadres and task shifting.

In recognition of this, in 2012 the MoHS developed the Policy for Community Health Workers in Sierra Leone and subsequently developed the Community Health Workers strategy outlining the roles and responsibilities of various stakeholders, the CHWs standards, the supervision and reporting required, and the content of the CHWs training.

The goal is to improve the communityôs access to health care services, especially the marginalized and vulnerable, with a special focus on mothers and children, by implementing the community aspect of the Basic Package of Essential Health Services (BPEHS), and accelerate the achievement of the relevant MDGs.

The objectives are to provide identified high impact interventions at the community level by:

- Building the capacity of CHWs and other community workers to provide these interventions;
- Ensuring CHWs are recognized, linked, functional, and supervised;
- Strengthening the community and formal health system linkages;
- Creating community demand;
- Co-ordinating and expanding health system and civil societyôs activities to increase healthy behaviours; and
- Ensuring regular M&E.

Basic Package of Essential Health Services (BPEHS)

One of Ministry of Health and Sanitationôs (MoHS) key responses to improving health service delivery was to develop a Basic Package of Essential Health Services to guide efficient policy prioritisation and implementation. This approach was adopted bearing in mind the need that the defined BPEHS would enable delivery of high impact cost effective primary care service delivery as the country also prepared for scaling up of health services including sexual and reproductive and child health services.

The major focus of the BPEHS is to reduce mortality rates, especially for infants and pregnant women. It will scale up interventions of the minimum package of essential services, including, utilisation of treated bed nets, promotion of early and exclusive breastfeeding, family planning to address problems of teenage pregnancies and child marriage, essential and emergency obstetric care including prenatal, delivery and post natal services, integrated management of neonatal and childhood illnesses, preventive services including immunisation and school health and promotion of hygiene practices.

The Basic Package consists of seven distinct elements:

- It identifies the services that the MoHS guarantees will be available to the population. Other services may be available as the result of global initiatives, vertical programmes, or private donations but they would be added to, not substituted for the services contained in the Package.

- It implies that a minimum set of health staff with appropriate skills will be present at each health facility to provide the services.
- It gives guidance for the content of training programmes by defining the technical and management competences required at different levels of the health system.
- It gives guidance to what will constitute an essential drugs list for each level of the health system
- It is presented in a way that it can be costed to give an idea of the financial resources that will be required for service provision
- It provides a base to preparing operational plans and to design Monitoring and Evaluation tools.

It also provides a comprehensive list of services to be offered at five standard levels of health care within the Sierra Leone health system:

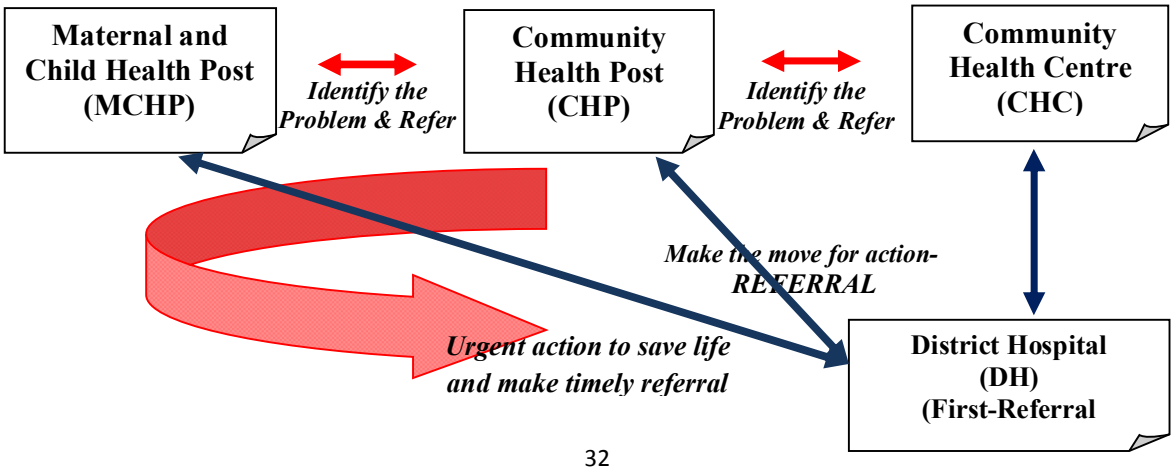
1. The Community level (CHWs; CBPs & TBAs)
2. Maternal and Child Health Post level (MCH Aides)
3. The Community Health Post level (CHAs)
4. The Community Health Centre level (CHOs)
5. The District Hospital (Doctors, Nurses, Laboratory Technicians)

The basic package of essential health services is characterised by the following:

- Services which have the greatest impact on the major health problems (especially that of maternal and child health)
- Services that are cost-effective and evidence-based
- Services which could be delivered to give equal access to both rural and urban populations.

The concept of the Basic Package of Essential Health Services (BPEHS) is that, all of the services in the package must be available as an integrated whole, rather than being available in piecemeal or as individual service. The Ministry will ensure that core services making up BPEHS are available nationwide and that additional services that are not part of the BPEHS are added as and when appropriate. These additional services will not substitute any of the Basic Package of Essential Health Services.

Figure 2: Flow of Referral between the Levels of Health Care Facilities



Types of Facilities:

- **Maternal and Child Health Post**

The Maternal and Child Health Post is the first level of contact of patients in the village and grassroots level. At these posts, one or more MCH Aides will live and perform their duties. An MCH Post should ideally serve a population of 500 to 5,000 within a 3-mile radius.
MCH Aides are to supervise the activities of the surrounding cluster of TBAs in such a way that their economic interests do not conflict. The TBAs assist the MCH Aides and refer pregnant women for antenatal, delivery and postnatal care. They are encouraged to assist with deliveries under the supervision of the MCH Aides.

Community Health Post

A Community Health Post is usually situated in a small town; it should serve a population of 5,000 to 10,000 within a 5-mile radius. These posts have similar functions to the MCHP with added curative functions. Community Health Posts have been manned by State Enrolled Community Health Nurses (SECHNs) or Endemic Disease Control Unit Assistants (EDCUAs), but in future by CHAs currently being trained.

The Community Health Post will relate to the Community Health Centre in the following ways:-

- Patients should be referred from the Community Health Post to the Community Health Centre where improved services can be offered
- Urgent and/or more serious referrals and emergencies on the other hand should go straight from the Health Posts to the District Hospital to avoid delays.

The Community Health Officer-in-charge of the CHC should support and supervise the person in charge of the Community Health Post, by visiting him and discussing health problems of the area.

Community Health Centre

The centre has preventive, promotive and curative functions. It should have a catchment population of 10,000 to 30,000 or more within a 5-10 mile radius. In addition to assisting normal deliveries, the community health centre can handle some complications; grave cases of childhood illness; treatment of complicated cases of malaria and inpatient and outpatient physiotherapy for disability. The facility will have space for inpatient care, as well as a laboratory. The staff of community health centre will also be larger than that of a post, including CHOs, nurses, midwives, and laboratory and pharmacy technicians.

In addition to its own catchment area, the CHC should supervise the Community Health and the MCH Posts, as well as the community related health workers in the chiefdom. Therefore, the Community Health Centre takes responsibility for the health of the whole Chiefdom.

District Hospital (First-Referral Hospital)

The district hospital bed capacity should not be less than 45 beds and must have two (2) resident doctors. It is the first-referral centre, which should handle all services in a holistic manner including the Basic Package of Health Services. Cases referred to the district hospital level include major surgery under general anaesthesia; X-rays; comprehensive emergency obstetric care, including Caesarean sections; and family planning methods relevant for Sierra Leone.

The hospital will also provide a wider range of essential drugs and laboratory services than the health centres. The hospital will be staffed with doctors, including male or female Obstetric/Gynaecologist, Surgeon, Anaesthetist, and Paediatrician; Midwives; Lab and X-ray Technicians; Pharmacist; and Dentist and Dental Technician. Each district hospital will cover a population of about 500,000.

Free Health Services Strategy

The NHSSP 2010-2015 key focus is delivery of the BPEHS at every level, in every district through provision of cost-effective interventions including emergency obstetric and new-born care, and preventive services such as immunisation, IMNCI, provision of insecticide treated bed-nets, integrated vector management, etc. However, in order for it to succeed, all barriers to accessing services must be removed, particularly the removal of user fees at the point of service delivery.

Provision of free health care in all peripheral health facilities and district hospitals has been implemented as a practical policy option to address some of the inequalities in access to health care. With the implementation of the FHC, service uptake has increased significantly. This has adversely affected service delivery quality due to shortages of staff, equipment and infrastructure at all levels.

Country COMPACT

The Country COMPACT has been signed and its implementation starts in 2011. The main objective of the partnership under this COMPACT is to contribute towards improving the health of the people of Sierra Leone through increased effective cooperation with our health development partners. The particular emphasis in both PRSP II and the National Health Sector Strategic Plan [2010-2015] (HSSP) is on the reduction of the high mortality rates in mothers and young children. The focus is clearly on improved health outcomes and impact, and on mutual accountability for the commitments entered into in the Sierra Leone health COMPACT. The scope of the partnership is both intersectoral and multidisciplinary.

This national COMPACT between the Government of Sierra Leone and its Development and Implementing Partners in health represents the collaborative framework for jointly implementing NHSSP under the principles of the Paris Declaration on Aid Effectiveness, the related Accra Agenda for Action and the International Health Partnership+, in other words, the framework within which the **Sierra Leone IHP+ Country Team** will operate. The COMPACT is intended to be a unifying instrument for ALL health partners in Sierra Leone and is therefore inclusive of all Health Partners active in the health sector in Sierra Leone irrespective of whether they have signed to up IHP + Global COMPACT or not.

Joint Programme of Work and Funding (JPWF)

The Government of Sierra Leone (GoSL) and its health development partners are implementing the COMPACT through the Joint Programme of work and Funding JPWF. The purpose of the Joint Programme of Work and Funding (JPWF) is to guide the activities and investment decisions of Government, and the health sector development partners over the next three years. It outlines the priority interventions to be focused on, their resource and financing implications. It is a Medium Term Expenditure Framework (MTEF) to addressing the policy objectives of NHSSP. The JPWF is a 3-year operational plan for the health sector, providing the basis for development of Annual Operational Plans (AOPs), which guide implementation of sector activities.

As JPWF, was jointly developed with all stakeholders in health. It is hoped that it will henceforth become a common converging point for all stakeholders for design of service delivery programmes, resource mobilization and a health financing framework as it embodies our dream for a better health care delivery system for all people of Sierra Leone.

The Joint Programme of Work and Funding (JPWF) outlines the priority health interventions to be implemented over the period 2011ï 2013, their resource implications and financing situation. It is a Medium Term Expenditure Framework (MTEF) to address the policy objectives of the NHSSP in the medium term. It is a tool for addressing the weaknesses in current practice of aligning policies, planning and budgeting for the health sector, as a means of gaining greater efficiency and effectiveness in the implementation of the ñAgenda for Changeò and the NHSSP.

Performance Based Financing for Sierra Leone

Performance Based Financing (PBF) is a strategy for financing healthcare service delivery which aims to give health professionals the resources and incentives they need to deliver quality services efficiently. PBF is one of the strategies that the Sierra Leone Ministry of Health and Sanitation (MoHS) has chosen to improve coverage and quality of health services, though a results-focused and motivated health workforce, in order to attain the health related Millennium Development Goals (MDGs). With the support of its development partners, the Government of Sierra Leone will implement a simple PBF Scheme for Primary Healthcare throughout the country in 2011.

This first phase of PBF for healthcare in Sierra Leone (2011-2012) will focus on six key reproductive and child health interventions which have been shown to be critical for reduction of child and maternal mortality: family planning, antenatal consultations, safe deliveries, postnatal consultations, full vaccination of children under one and curative consultations for children under five. It is anticipated that the lessons learned from implementation of this simple scheme will enable us to expand to a comprehensive PBF Scheme that covers both primary and secondary healthcare services at a later date.

The PBF has recently been extended to two Tertiary hospitals, Ola during and the Princess Christian Maternity Hospital PCMH.

A: Vision and Objectives

The Ministry of Health and Sanitation aims to provide accessible, affordable, equitable and high quality health care services for all Sierra Leoneans by developing and establishing a need-based health care system which specifically addresses the health of mothers and children, the poor and the disadvantaged, through strengthening the national health systems to achieve positive health-related outcomes.

B: Health System Challenges

The Ministry of Health and Sanitation is faced with the following challenges in 2008/2009 against which it developed strategies for reducing adverse health effects with particular attention to mothers and children.

The challenges include:

C1: High Infant, Child, and Maternal Mortality Rates

- ***Infant Mortality***: According to DHS, the Infant Mortality Rate of Sierra Leone in 2008 stood at 89/1000 and Child Mortality Rate 140/1000 live births [DHS 2008].
- ***Child Mortality***: In 2009, UNICEF/WHO estimated Child Mortality Rate in the country at 192/1000 live births thereby locating Sierra Leone among countries with the highest child mortality in the world. One quarter of all under-five years of age deaths occurred during the neonatal period. There is no difference between urban and rural communities. Sixteen percent of deaths in 2010 were due to pneumonia, however only 22% of children with pneumonia were treated with antibiotics.
- ***Malaria, Respiratory Infection, Worm Infestation, Diarrhea, and Malnutrition***: Overall, malaria is the leading cause of morbidity and mortality. It accounts for 40% of outpatient morbidity for all age groups. It accounts for 47% of outpatient morbidity for under five children and it contributes 38% of under fives and 25% of all ages mortality rates. It also accounts for 37.6% of all hospitalization with a case fatality of 17.6% (SLNMCP Strategic Plan 2011-2015). Respiratory infection, worm infestation, diarrhea and clinical malnutrition account for the remaining hospital consultations. Over one third of under-fives are stunted due to malnutrition, however, only 32% of infants are exclusively breastfed, even though this intervention could reduce under-fives deaths by 12.5% [MICS 2010]
- ***Maternal Mortality***: In 2008, the Sierra Leone Demographic and Health Survey [SLDHS] estimated Maternal Death Rate at 857/100,000 live births for the period 2002-2008.
- ***Vaccine Preventable Diseases***: Diphtheria, whooping cough [pertussis], tetanus, poliomyelitis, measles and tuberculosis are some of the disease conditions that are preventable.

C2: Other Illnesses and Diseases

- Like many other countries in the West African Region, Sierra Leone suffers from heavy disease burden of malnutrition, poor reproductive health, communicable and non-communicable diseases such as tuberculosis, acute respiratory infection, diabetes, HIV/AIDS, cancers, and cardio-vascular diseases. Many of these conditions are susceptible to cost effective intervention.

- ***Malnutrition:*** 21% of children under-five years of age were found to be malnourished and underweight in 2008 or too thin for their age. 34% were stunted or too short for their age. 10% were wasted or too thin for their height. [SSL] 2009]
- ***High Fertility Rate.*** Fertility rate is high, estimated at 5.1 for women in 2008 partly due to low contraceptive utilization, rural residence, and low socio-economic status with low age at first birth.
- ***Access to Clean Water and Sanitation***. More than one third of the population does not have access to safe drinking water, and only 66% have access to improved sanitation facilities [MOHS 2010].
- ***HIV/AIDS*** An important challenge and component of the National Health Sector Strategic Plan is the detection, prevention and treatment of HIV/AIDS.

C3: Associated Challenges

- ***Service Delivery***. Health facilities are poorly distributed. Geographic access to facilities varying from 33% in Koinadugu to 99% in the Western Area. Access to health facilities within chiefdoms in the same district is not uniform. Facilities are not adequately equipped.
- ***Workforce.*** There is a critical shortage of all categories of health workers and professionals, doctors, nurses, midwives, laboratory technicians, and health information officers. The ratios of medical doctors, nurses and midwives per 10,000 populations are 0.26, 3.3 and 0.23 respectively. These figures are far below WHO recommended ratios for the delivery of quality health care. The critical shortage of essential health personnel compromises both quality and effectiveness of care, including measures developed to address health system challenges. Key health training institutions provide low turn-out of graduates to meet demands. Many training institutions have poor infrastructure, under-staffing, inadequate training and learning models, and lack equipment. Much of the existing health workforce requires professional development.

NGO Policy Regulations, Policy and Guidelines for the Operations of Non-Governmental Organizations in Sierra Leone

The participation of Non-Governmental Organisations (NGOs) in the National Development efforts of Sierra Leone dates back to the early 1960s. Religious bodies working in Parishes took the lead in stimulating development activities at grassroots level with the active participation of the people.

1. Increased awareness of the vital role of NGOs has continued to attract local, private and public donations as well as international donor funding for implementing specific activities throughout the country since the 1970s. A consultative forum in the form of a workshop resulted in the formulation of the NGO Policy document in 1994.
2. The 1980s witnessed a steady increase in the number of NGOs operating in Sierra Leone as bilateral and multilateral agencies shifted their aid strategy to channel resources directly to beneficiaries through their grassroots organisations. The big influx of Liberian Refugees and internally displaced Sierra Leoneans in the 1990s has resulted in the proliferation of both national and international NGOs undertaking Relief and Development activities with mixed results. At the same time, ineffective coordination, monitoring and evaluation mechanisms have made it difficult to assess the impact of the

variety of interventions, avoid costly duplication of efforts and derive maximum benefits for the country and people

2.4 National health sector strategic plan

National Health Sector Strategic Plan [NHSSP, 2010-2015]

In 2009, the Ministry of Health and Sanitation [MOHS] undertook a review of the countryôs health system and services from which it developed a 5-year National Health Sector Strategic Plan [NHSSP, 2010-2015][i]. Recognizing that most causes of sickness and death in the country, especially among pregnant women and children, are preventable, the Ministry developed a six-pillar response framework targeted at leadership and governance, service delivery, human resources, health financing, medical products and technologies, and health information. To achieve efficient and effective administration of the plan, the six pillars are anchored on the foundations of budgeting, monitoring, and evaluation using a framework for decentralized and individualized Local Council health plans. The Pillars are: (1) leadership and governance, (2) service delivery, (3) human resources for health, (4) healthcare financing, (5) medical products and technologies and (6) health information systems.

The joint development, validation and Health Sector Collaboration Committee (HSCC) adoption of the NHSSP laid a foundation for the sectorôs desire to progress into a methodological sector wide approach as part of the sectors priority intervention from the first year of implementation.

The Ministry of Health and Sanitation has worked closely with government stakeholders and development partners using the NHSSP as a guiding document to set out priority interventions as outlined below:

The government commits to substantially increase financing the health sector in line with the Abuja Declaration and developing new financing mechanisms including a social health insurance scheme. However, additional resources are still needed to carry out the following:

- The procurement and supply chain management system will be strengthened to ensure that there are sufficient drugs and equipment supplied at point of use.
- Increase the number of healthcare workers and ensure equitable distribution, by providing remote allowance and introduce performance-based incentives to promote quality healthcare services.
- Strengthening oversight, co-ordination and management at all levels to ensure transparency and efficiency, and monitor performance.
- Communicate the policy to allow people to exercise their rights to free healthcare.

2.5 National development plan

The broad policy direction is provided by the Agenda for Prosperity (Sierra Leoneôs Third Generation Poverty Reduction Strategy Paper (2013 ï 2018).

Following the tremendous progress in the implementing the Agenda for Change (2007 ï 2012), the government of Sierra Leone embarked on the preparation of the Agenda for Prosperity (2013 ï 2018). The Agenda for Prosperity builds on the successes of the Agenda for Change and lays the foundation for the journey to achieving sustainable future for all Sierra Leoneans.

The Agenda for Prosperity (AfP) (2013 -2018) focus on eight priority pillars in terms of proposed policy, objectives and strategies. The pillars are:

Pillar 1 ï Economic Diversification
Pillar 2 ï Managing Natural Resources
Pillar 3 - Accelerating Human Development
Pillar 4 ï Promoting International Competitiveness
Pillar 5 ï Labour and Empowerment
Pillar 6 ï Social Protection
Pillar 7 ï Governance and Public Sector Reform
Pillar 8 ï Gender Equality and Womenôs Empowerment

Accelerating Human Development (Pillar 3) is fundamental to improving living conditions, increasing national prosperity and building international competitiveness in an equitable environment. The goals of Pillar 3 are to develop human capital, to empower people through the provision of human services to reduce poverty, and to accelerate the achievement of the Millennium Development Goals.

Improving the health of the poor, particularly women and children, is an investment in economic and social growth and development, and a priority for reducing poverty. Good health contributes to improved human capital, high labour productivity, enhanced domestic and foreign investment, and robust national savings. Over the next five years, Sierra Leone will strengthen existing health programmes and introduce new policies and services that will elevate service quality and accessibility.

Sector Objectives and Strategies - AfP

The medium to long term strategy for the health sector as outlined in the Agenda for Prosperity (AfP) is to provide universal coverage of quality health care in established centre sod excellence. In the short term, the focus is on the provision of free preventive health services at point of deliver;, universal access to family planning; establishing a National Health Insurance Scheme; providing specialist care in every provincial hospital; training more medical personnel, particularly in maternal and child health; signing Citizens ñ Performance Charterò; providing support for all aspects of reproductive health; and providing free health care for other vulnerable groups including disabled people. Government will therefore focus on the following:

- Reducing high infant, under ï five and maternal mortality
- Providing nutrition services
- Strengthening mental health programmes
- Strengthening health services for the physically ï challenged
- Accelerating provision of water & sanitation services
- Preventing and controlling communicable and non-communicable diseases
- Improvement of human resources for quality health care delivery
- Improvement of availability of drugs and medical technology supply
- Strengthening health sector governance for quality health care delivery
- Strengthening health care financing
- Strengthening infrastructural development for service delivery

2.6 Organizational Structure for Malaria Control

Sierra Leone Malaria Control Strategic Plan (2011-2015) is the main policy document guiding malaria control in Sierra Leone. This document has been developed through extensive consultations with partners and key stakeholders; collection and analysis of available evidence such as the Malaria Indicator Survey report, among other relevant documents. The Vision of the malaria control programme was **"Access to malaria control for all."** The Government of Sierra Leone believes that every person has the right to access highly effective malaria curative and preventative services delivered as close to the home as possible. The goal of the Malaria control programme in Sierra Leone was to improve the health of its people, and thereby their quality of life, by reducing the malaria burden in the country. This goal was achieved through scaling up access to evidence based malaria control interventions to the entire population. The general objective is to reduce the current levels of malaria morbidity by 50% and to reduce mortality by 25% by 2015 in line with the attainment of the Millennium Development Goals (MDGs).

2.7 Key Strategies for Malaria Control

Strategies to achieve the objectives envisaged in Sierra Leone as outlined in the current Strategic Malaria Plan include the following:

- Equip all health facilities with malaria diagnostic facilities (microscopes or RDTs) and provide effective and quality affordable antimalarial drugs.
- Strengthen human resource through in-service training of laboratory technicians, pharmacists, clinicians and other relevant health staff.
- Scale-up community based treatment of malaria in all districts through the home base care of malaria targeting children under five years, adolescents and adults living in rural areas and areas with limited access.
- ITN scale-up access to Long Lasting Insecticide Nets (LLINs) to achieve universal coverage
- IRS to be scaled up rapidly, building on the lessons learnt in the four pilot districts.
- Strengthen the routine data collection system to capture reliable information, and undertake regular operation al researches to provide evidence for decision making.
- Forge functional partnerships and mechanisms between departments, programmes within and outside the health sector.

2.8 Key Players in Malaria Control

Table 1: Table showing key players in malaria control

No.	Name of RBM Partner	Thematic Areas						
		Governance & Programme Management	Malaria Vector Control	Malaria Disease & Case Management	Malaria Prevention & Treatment In Pregnancy	Advocacy, IEC/BCC & Community Mobilisation	Epidemiology, Surveillance, M&E & Operational Research	PSM
1	WHO		X	X	X	X		
2	UNICEF			X				X
3	Catholic Relief Services (CRS)					X		
4	World Vision Sierra Leone		X	X		X		
5	Sierra Leone Red Cross Society (SLRCS)		X			X		
6	Medical Research Centre (MRC)			X			X	
7	Medicines San Frontiers (MSF)			X				
8	BRAC					X		
9	UNHCR							
10	United Methodist Church		X	X		X	X	
11	Health and Social Development Association (HASDA)					X		
12	Nets for Life (Anglican Diocese of Bo).					**X**		
13	Plan Sierra Leone			X				
14	Pikin to Pikin					X		

No.	Name of RBM Partner	Thematic Areas						
		Governance & Programme Management	Malaria Vector Control	Malaria Disease & Case Management	Malaria Prevention & Treatment In Pregnancy	Advocacy, IEC/BCC & Community Mobilisation	Epidemiology, Surveillance, M&E & Operational Research	PSM
15	Save the Children			X		X		
16	Nets for Life (Anglican Diocese of Bo)		X			X		
17	IRC			X				
18	CARE			X				
19	FHADA					X		
20	SNAP		X			X		
21	ABC			X				
22	Tony Blair Faith Foundation					X		
23	Pharmacy Board of Sierra Leone	X		X				
24	CAWeC					X		
25	Logistics Solution and Services		X	X				
26	ChildFund			X		X	X	
27	Concern Worldwide-Sierra Leone					X		
28	DfID		X		X			
29	MIRAL			X		X		

Source: NMCP/RBM partnership database 2013

As part of its Public Private Partnership agenda, the NMCP is currently collaborating with 14 private sector facilities for malaria case management. Representatives of these facilities were trained on national treatment guidelines and protocols and data collection and reporting tools have been harmonized. These efforts will be expanded in the future.

At the district level, DHMTs have Memorandum of Understanding with several private health facilities to ensure better coordination and collaboration between public and private health sectors.

The RBM partnership, to which the private sector participates, provides a platform to discuss policies and strategies and mainstream activities such as social mobilization, distribution of LLINs or ACTs

2.9 Linkages and coordination

Programme Coordination

Partnership Strengthening and Programme Management Support:

A COMPACT agreement between the GoSL and its health development partners was signed in May 2012. This agreement is intended to guide all health partners working in Sierra Leone. This Compact provides a framework for adherence by all partners to the principles and approaches set out in the global IHP Compact, which reflects the goals of the Paris Declaration. It defines coordination mechanisms ensuring alignment of all support to the government plans including Malaria.

At the central level, the MoHS has an NGO Liaison Unit to coordinate the work of NGOs implementing health projects. For malaria specific activities, the coordination of activities is done through Roll Back Malaria forum.

To enhance decentralization, comprehensive district health plans are annually developed by DHMTs in coordination with local councils and other stakeholders. Monthly coordination meetings with implementing partners are also a key coordination tool at the district level.

The overall goal of this intervention has been to improve performance of the NMCP. The private and informal sectors were encouraged among other partners to play increasing roles in RBM

At district level, the coordination of malaria activities are managed by the District Medical Officers and as much as possible integrated into the overall health coordination activities.
Nationally, the primary responsibility of coordination and monitoring of malaria related activities and their integration within the overall health sector has been the responsibility of the NMCP. There are two mechanisms of coordination at national level:

Malaria Technical Working Group (TWG) – RBM Partnership

This working group met at least quarterly and comprised of the technical staff of the Malaria Control Programme and any interested health partner. This forum discussed issues regarding policy and implementation guidelines of all aspects of malaria controlled, developed and updated malaria related policies, strategies and guidelines as needed as well as reviewed emerging new evidences and made recommendations to the overall RBM coordination forum and the Ministry of Health and Sanitation.

Technical Working Groups

Examples of such task-focused committees are Drug Policy Review Committee, Monitoring and Evaluation Working Group, Malaria Advocacy and Communications Committee, Procurement and supply chain management (PSM) Technical Working Group, Case Management/Home Based Care Technical Working Group, ITN Coordinating Committee and Social Mobilisation TWG.

2.10 Conclusions and Recommendations

2.10.1 Conclusions

- Long history of malaria control activities in Sierra Leon over decades influenced mainly by many Global Initiatives. Most of these initiatives were however prematurely aborted after the Global Initiatives ceased due to under-funding.
- Previous control measures undertaken over the years met with limited success mainly due to a number of factors including focus on single strategies, lack of funding, poor human resource capacity and non-involvement of NGOs, civil society and other stakeholders.
- There is a well-designed national malaria Strategic Plan with clearly defined measurable objectives and targets but intermediate targets were not defined.
- Policy framework is supportive of malaria control in Sierra Leone

2.10.2 Recommendations

- Next Strategic Plan should provide yearly targets also instead of end-period targets only.
- Sustainability plans should be developed to ensure that malaria control interventions do not depend on donor funding or donor initiatives only.

3. Epidemiology of malaria

3.1 Geographical distribution of malaria

Sierra Leone is located on the West coast of Africa, between latitude 7-10° North and longitude 10-13° west. It covers a land area of 71,620 km2 and is bounded by Guinea to the North and East, Liberia to the South, and the Atlantic Ocean to the South and West. The terrain consists of a coastal belt of mangrove swamps, wooded uphill country, an upland plateau and mountains in the east (CIA Fact Book). The altitude rises from sea level on the coast to the highest point at Loma Mansa at 1,948 m. The climate is tropical, hot and humid with temperatures ranging from 21 to 32°C and a relative humidity ranging from 60 to 90%. There are two major seasons, a summer rainy season (May to October) with heavy rains in July and August, and a winter dry season (November to April). Malaria is known to be endemic all year round with seasonal variations at the start and end of the rainy season (April and October) in Sierra Leone. It is a major public health problem and also an important cause of morbidity, mortality, disability and poverty.

3.2 Population at risk

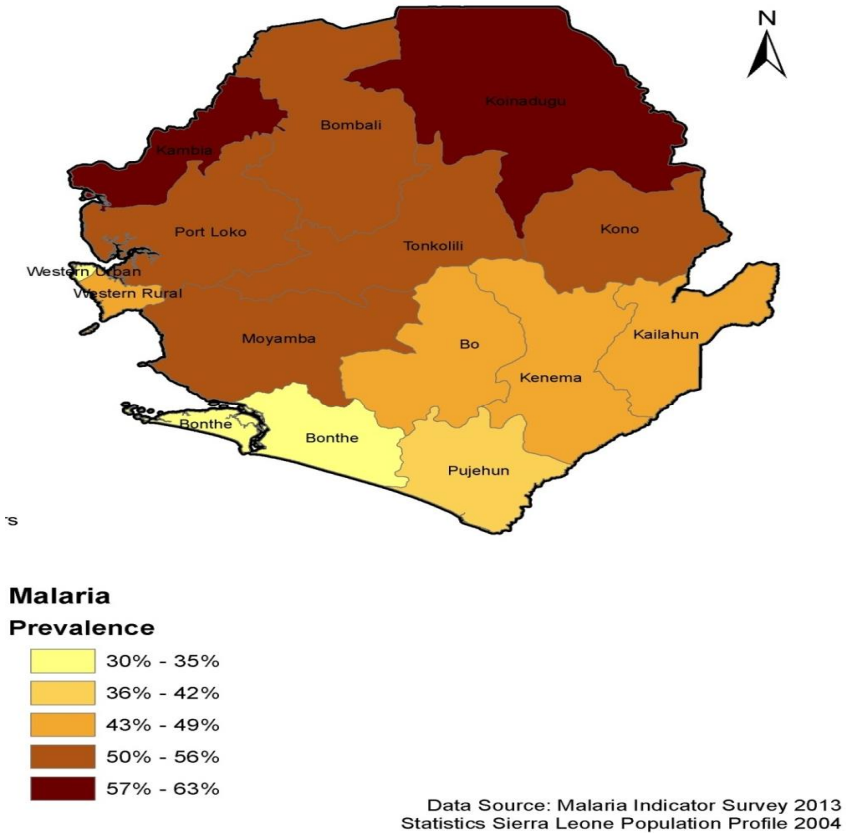
Malaria is endemic in Sierra Leone with seasonal peaks at the beginning and end of the rainy season (April & October). The entire population is at risk but pregnant women, children under 5 years and people living with HIV/AIDS are most vulnerable The Health Information Bulletin of MoHS in 2011 reported that, 41.1% of children <5 years who sought consultation were for malaria (HMIS data)

3.3 Stratification and risk map

Sierra Leone has two distinct malaria epidemiological strata. In two-thirds of the districts, malaria is characterised by seasonal peaks of transmission and in the remaining one-third of the districts malaria transmission is more stable all year round. The figure below shows the malaria prevalence by district among children less than five years in February/March 2013.

In 2013, Sierra Leone conducted the first national Malaria Indicator Survey (MIS) that is inclusive of rapid diagnostic testing (RDT) and microscopy to determine the national malaria prevalence among children under 5 years of age. This survey revealed that, one-third (33%) of children under age 5 had fever during the two weeks preceding the survey, with a higher proportion of rural children (37%) than urban children (32%) having fever (MIS, 2013). When tested for malaria, 46% of the children age 6-59 months were positive based on Rapid Diagnostic Tests (RDTS). Analysis of the blood smears by microscopy revealed a slightly lower prevalence of 43% of children tested positive for malaria. However, differences in malaria prevalence observed between the RDTs and microscopy are expected. Regardless of which diagnostic test was used, malaria prevalence generally increases with age among children 6-59 months.

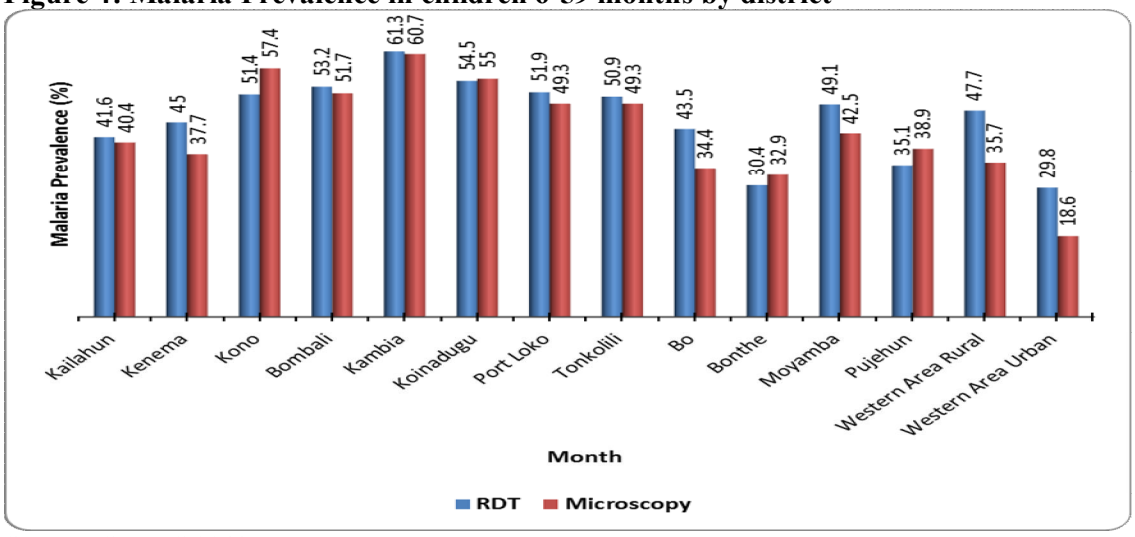
Figure 3: Geographical spread of malaria among children under five years in Sierra Leone



Source: SLMIS 2013

When compared by district, malaria prevalence is highest for microscopy in Kambia and Koinadugu districts in the northern region of Sierra Leone as illustrated in the map above and figure 4 below.

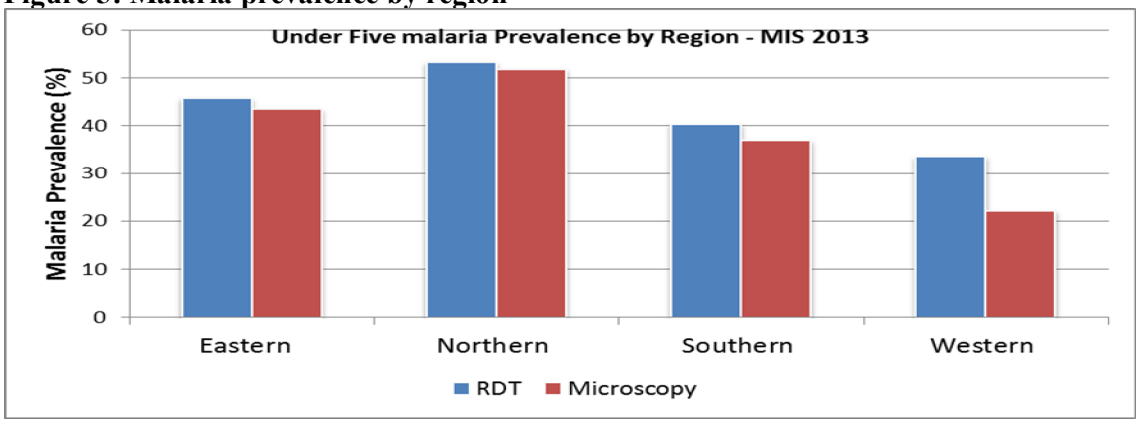
Figure 4: Malaria Prevalence in children 6-59 months by district



Source: SLMIS 2013

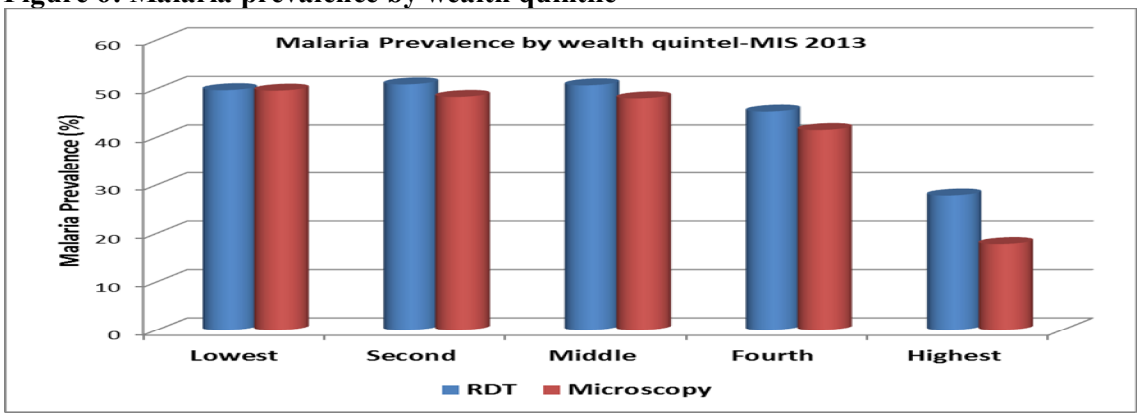
The figure below shows that, malaria prevalence by microscopy is highest in the Northern Region (52%) compared to the prevalence in the Eastern Region (44%), Southern Region (37%) and Western Area (22%).

Figure 5: Malaria prevalence by region



Source: SLMIS 2013

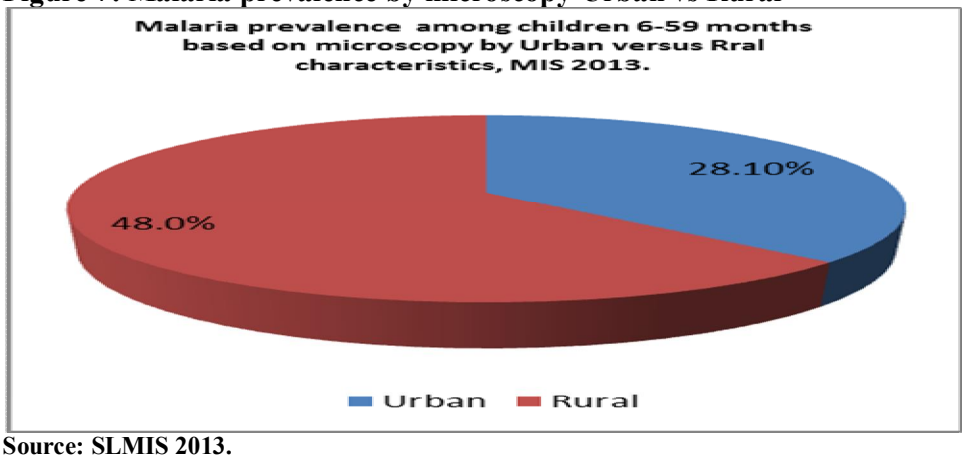
Figure 6: Malaria prevalence by wealth quintile



Source: SLMIS, 2013.

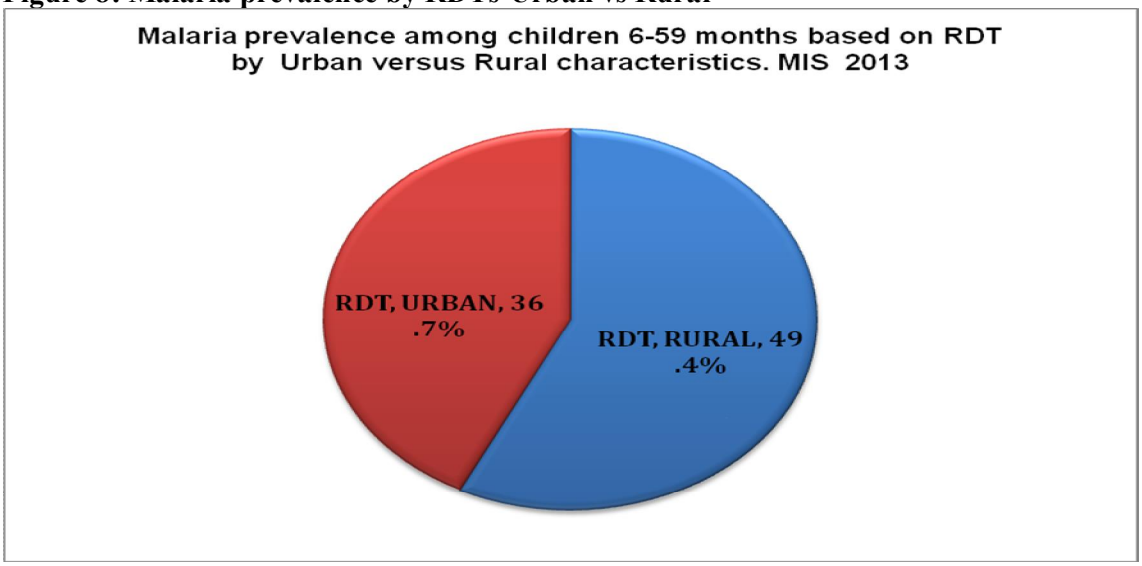
The figures 7 and 8 below show that the prevalence of malaria in children aged 6-59 months is higher in rural areas than urban areas both for microscopy and RDTs. By microscopy, 48% and 28.1% of children tested were positive for malaria in rural and urban areas respectively. The RDT results revealed that, 49.4% and 36.7% of children 6-59 months were positive in the rural and urban domain respectively.

Figure 7: Malaria prevalence by microscopy-Urban vs Rural



Source: SLMIS 2013.

Figure 8: Malaria prevalence by RDTs-Urban vs Rural



Source: SLMIS 2013.

3.4 Malaria parasites

Plasmodium falciparum is the dominant parasite mainly responsible for all severe cases and over 90% of uncomplicated cases. However, there are also cases of clinical malaria caused by *Plasmodium malariae and ovale* or a mixture of these and *falciparum* National Malaria Control Policy Document, 2010.

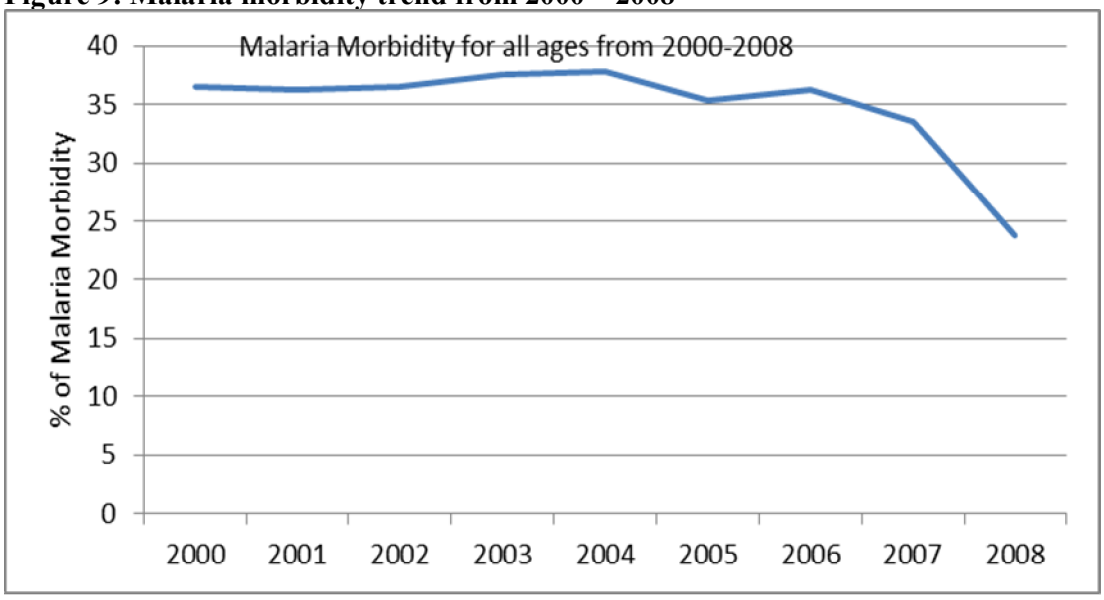
3.5 Malaria vectors

A recent study conducted in Freetown showed that *An. gambiae s.s* is the dominant sibling species of *An. gambiae* complex in Freetown. Other species are *Anopheles funestus* and *Anopheles melas*

Sierra Leone is mountainous; forested and has mangrove and inland swamps which provide ideal breeding places for the anopheline vectors of malaria.

3.6 Disease trends

Figure 9: Malaria morbidity trend from 2000 – 2008

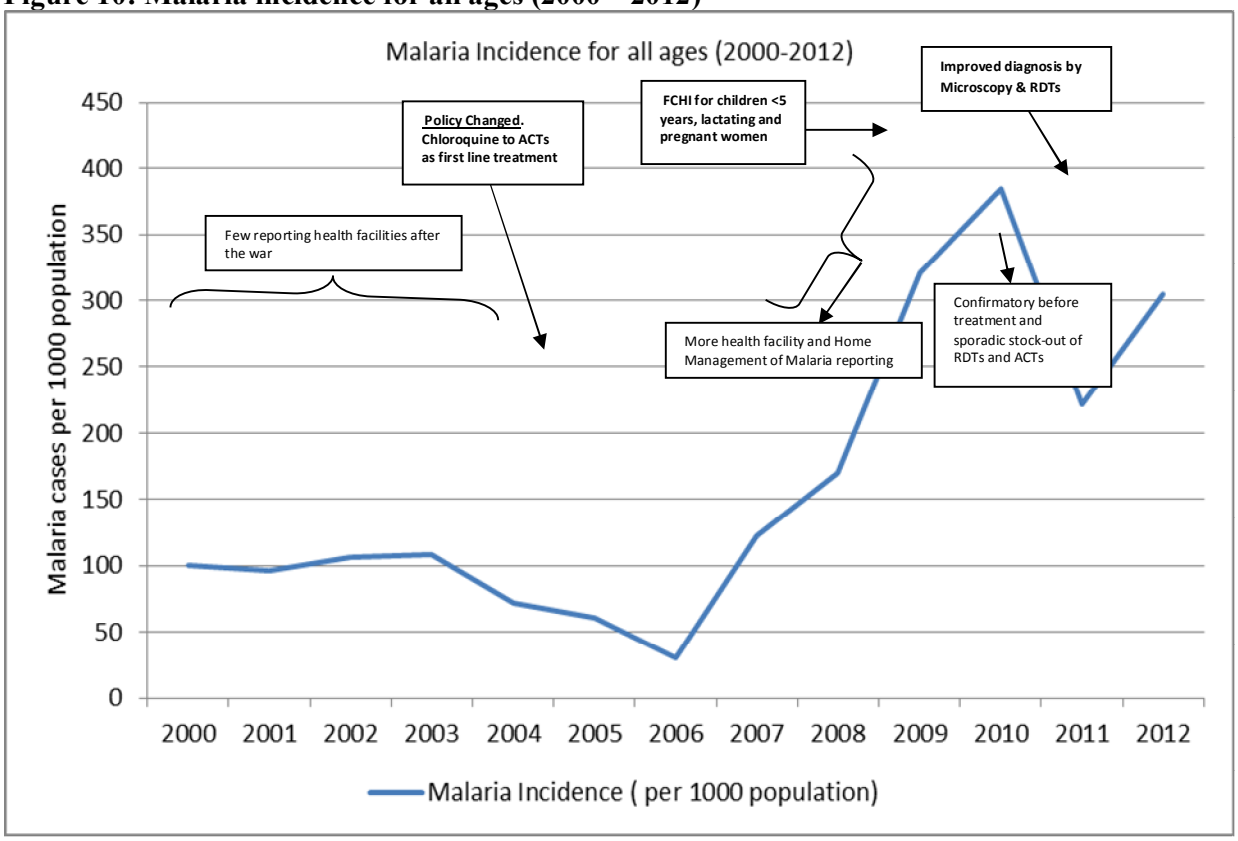


Source: Surveillance data base – MOHS/DPC/NMCP (2000-2008)

Morbidity attributed to malaria for all ages from 2000 to 2008 was on average around 36% of all out-patient consultations.

Data on malaria related mortality is difficult to get as the data collection and reporting tools during this period did not capture this variable. Additionally, confirmatory diagnosis of malaria was low; treatment was based on signs and symptoms, using fever as a proxy for malaria infection especially for children under five years and pregnant women.

Figure 10: Malaria incidence for all ages (2000 – 2012)



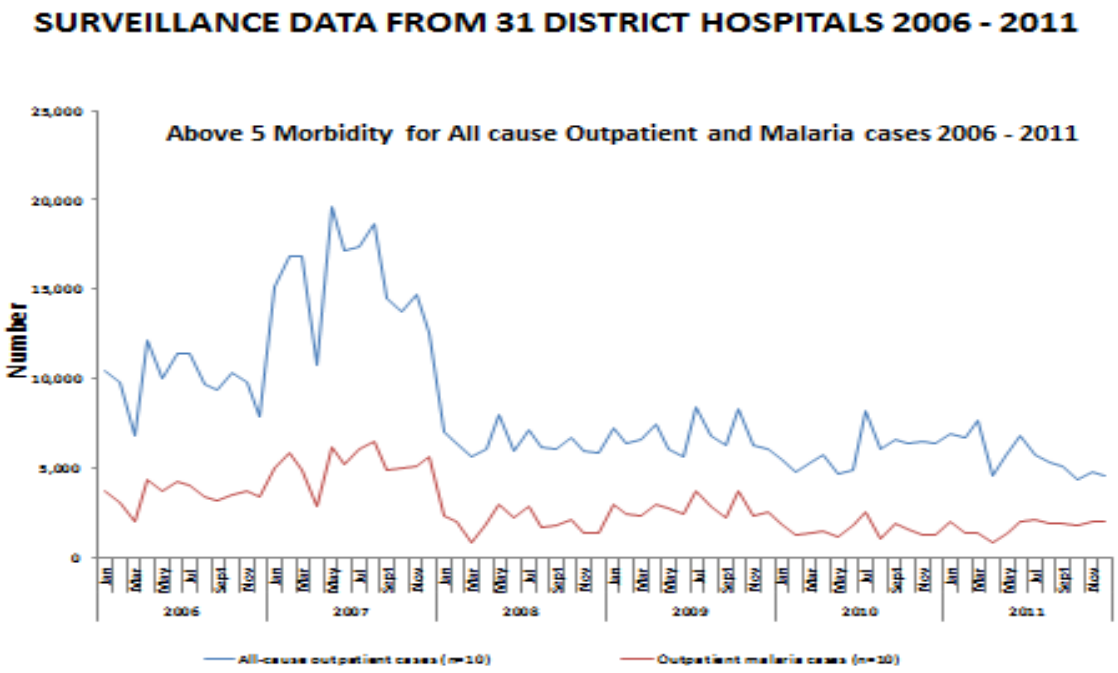
Source: MoHS/DPC/NMCP databases

Sierra Leone has a Health Management Information System (HMIS) which includes all public and faith based supported health centres and hospitals but the reporting completeness for key malaria indicators is unsatisfactory. Therefore, special retrospective study on selected hospitals with complete data and laboratory services was taken as best option to assess the trends on malaria admissions and deaths following the scale up of interventions.
In 2012, the National Malaria control programme with support from WHO conducted a Rapid Impact Assessment of malaria cases, hospital admissions and deaths following scale-up of antimalarial interventions, 2006-2011 in Sierra Leone.

Data were collected from all 30 hospitals in the 13 districts for a period of 2000ï 2010. Only 14 of the 30 district hospitals with complete data for number of microscopically tested cases and confirmed cases; and 10 hospitals for outpatient inpatient cases and deaths during the study period were used for analysis.

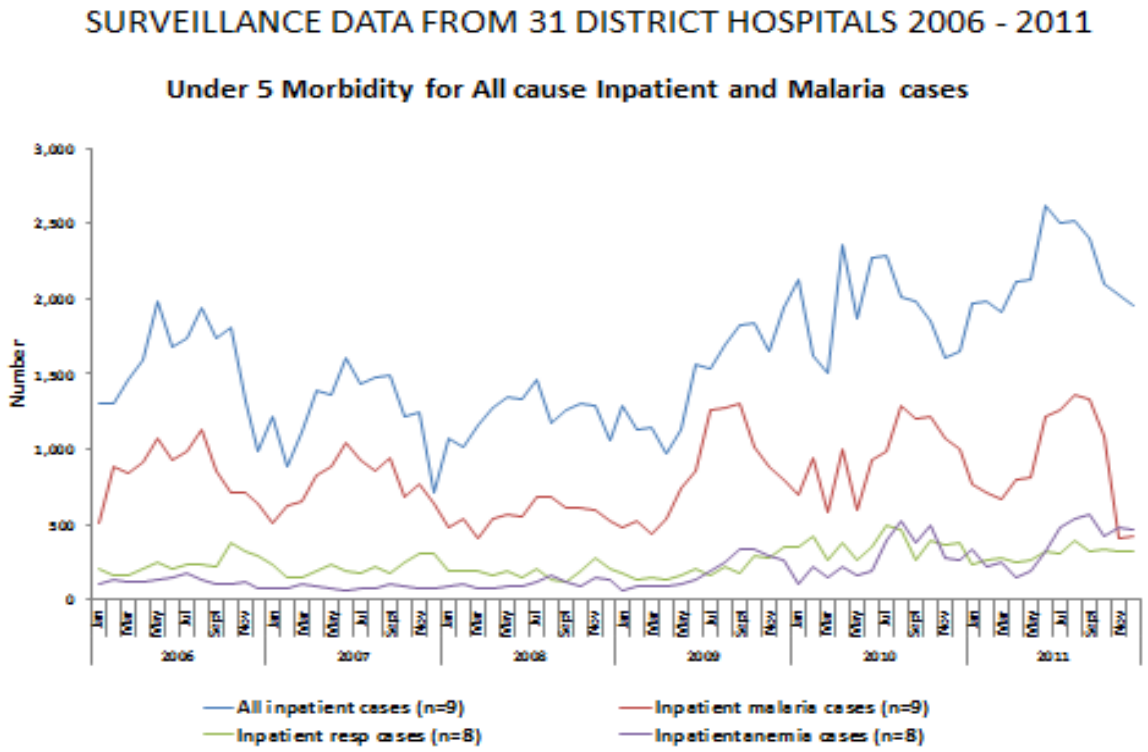
Monthly facility summary reports were used as the main sources of records: i) laboratory records for the number of positive blood slides and the number of cases that were tested; and ii) inpatient discharge records for numbers of malaria inpatient cases and malaria deaths. Figures 18-21 illustrate malaria related indicators (outpatient confirmed malaria cases, slide positivity rate, inpatient cases and deaths) surveillance data from 31 district hospitals 2006-2011.

Figure 11: Above 5 morbidity for All cause Outpatient and Malaria



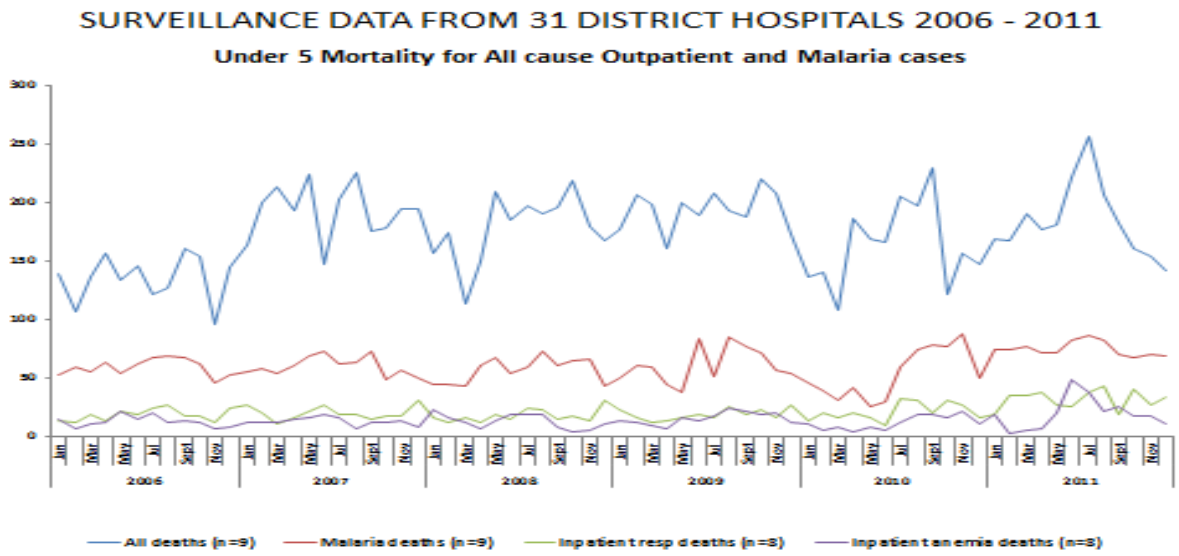
Source: Rapid Impact Assessment, 2011

Figure 12: Under 5 morbidity for All cause Inpatient and Malaria



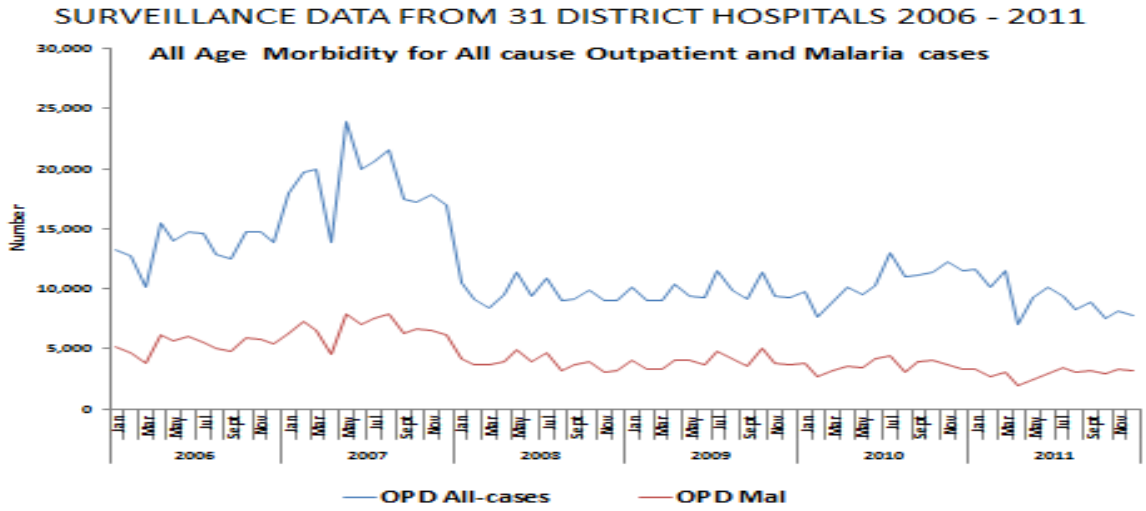
Source: Rapid Impact Assessment, 2011

Figure 13: Under 5 mortality for All cause Outpatient and Malaria



Source: Rapid Impact Assessment, 2011

Figure 14: All Age Morbidity for All cause Outpatient and Malaria



Source: Rapid Impact Assessment, 2011

3.7 Conclusions and Recommendations

The hospital data excluding Ola during hospital (located in the Western urban district surrounding Sierra Leone), indicate decline in malaria inpatient cases and deaths during 2006-2011. The rather increase in both malaria cases and deaths in this particular hospital affected the overall national trend, indicating its increased use by the population in this facility subject to its location in the capital in search of improved service post-conflict, does not indicate a significant decline in laboratory confirmed malaria cases, admissions and deaths at district hospitals in Sierra Leone. This was followed by a marked increase in ITN coverage in 2010 assuming ACT use was uniform throughout the years since its introduction. The rather increase in laboratory confirmed cases, inpatient cases and deaths could be due to increased

access to health services post conflict and may not reflect the actual transmission of malaria at the population level.

Key issues and Action Points

Key Issues

- Data quality in terms of completeness, accuracy and consistency
- Evolving indicators
- Changing data collection system
- Using the data to inform policy
- Last entomological inoculation rate was calculated during studies in 1990-1994 (EIR=6.1-884.2)
- Funding for subsequent malaria epidemiological studies and surveys

Action points

- Funding for entomological studies to assess transmission
- Further use of the available data-both HMIs and survey to better describe the malaria situation
- Further training on the use of key statistical software e.g. Stata, GIS, Epi Info to perform the above task

4. Programme performance by thematic areas

4.1 Programme management

4.1.1 Introduction

This section provides information on the governance and programme management structure/systems for malaria in terms of Policy formulation, Organisational structure and oversight responsibility, Stakeholder participation, coordination and partnership arrangements, Health system responsiveness (health sector priority, national development agenda, regulatory framework in support of malaria control), Accountability, Human resource capacity development, Supervision, and systems for monitoring and evaluation of performance.

4.1.2 Policy

This is fully described under section 2.3 above

4.1.3 Organisation

Organizational Structure

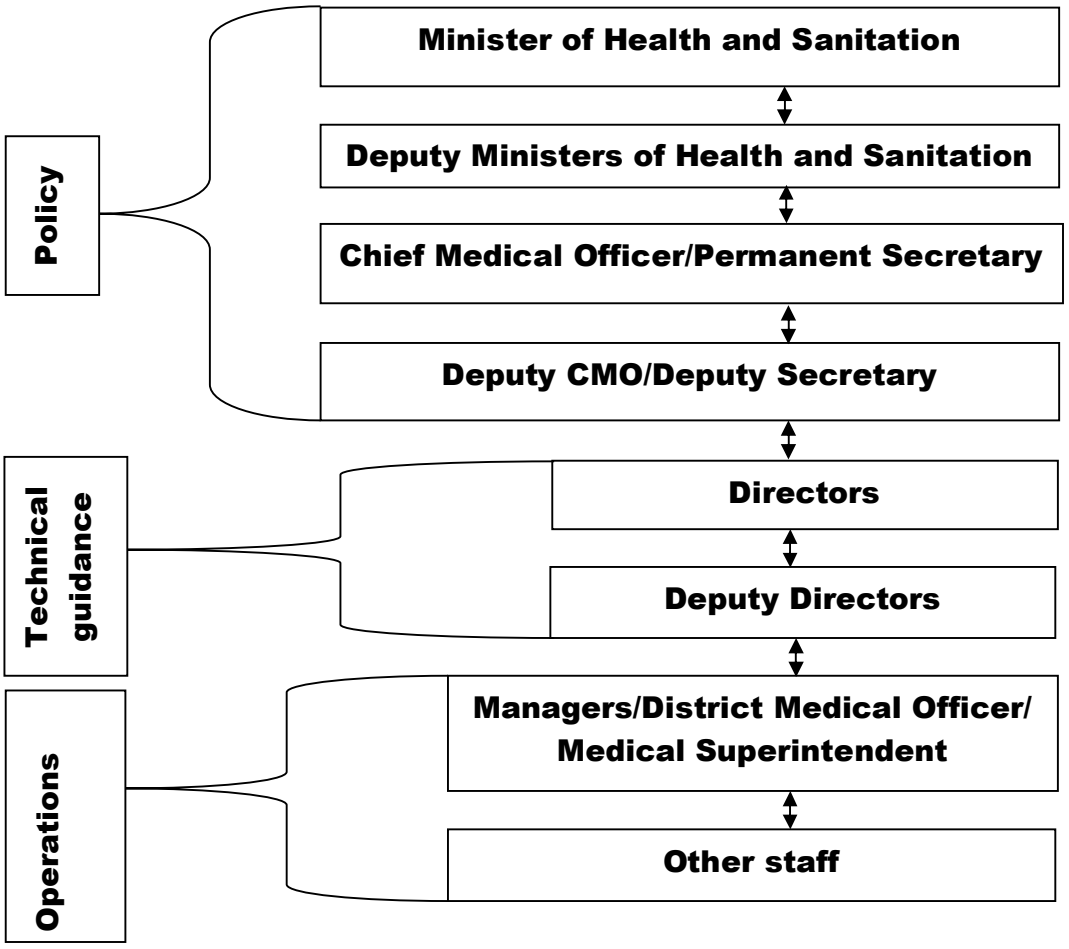
The Health sector in Sierra Leone is public and private. The public sector comprises Sierra Leone Health Service including regulatory bodies, Health development and implementing partners and Teaching Hospitals. The private sector is made up of faith-based and private-for-profit health institutions.

The Sierra Leone Health Service is a three-tier health delivery system of primary, secondary and tertiary levels. The Primary Health Care level is the sub district level involving Peripheral Health Units (PHUs) where a District Health Management Team (DHMT) is responsible for the management of health services and it is headed by the District Medical Officer. At the Primary Health Care level the sub levels of Peripheral Health Units viz. Community Health centre (CHC), the Community Health Post (CHP) and the Maternal Community Health Post (MCHP). A Community Health Officer (CHO) or Maternal Community Health Aide is made to be in charge of health service delivery in these health facilities.

Each district has a hospital which provides secondary care services. It serves as referral hospital for the PHUs. It is headed by a Medical Superintendent who is a medical doctor and a Matron. They are both members of the DHMT. He also reports to the DHMT that is headed by the District Medical Officer.

Organogram of the Ministry of Health and Sanitation

Figure 15: Leadership structure in the Sierra Leone Health Service



At the regional level we have regional hospital, which is the referral level facility for secondary care and run by general practitioners and specialists. There are three regional hospitals based in the provinces receiving referrals from districts and providing outreach support to districts in Sierra Leone. These are classed as the tertiary level. In addition there are five (5) tertiary facilities in the western area.

Both the Directors of Primary Health Care Services and Hospital and Laboratory Services oversee all matters of health at the primary, Secondary and Tertiary levels and reports administratively to the Chief Medical Officer who is the professional head of the Ministry of Health and Sanitation (MoHS) who reports to the Minister of Health. The Permanent Secretary is the vote controller and administrative head of MoHS.

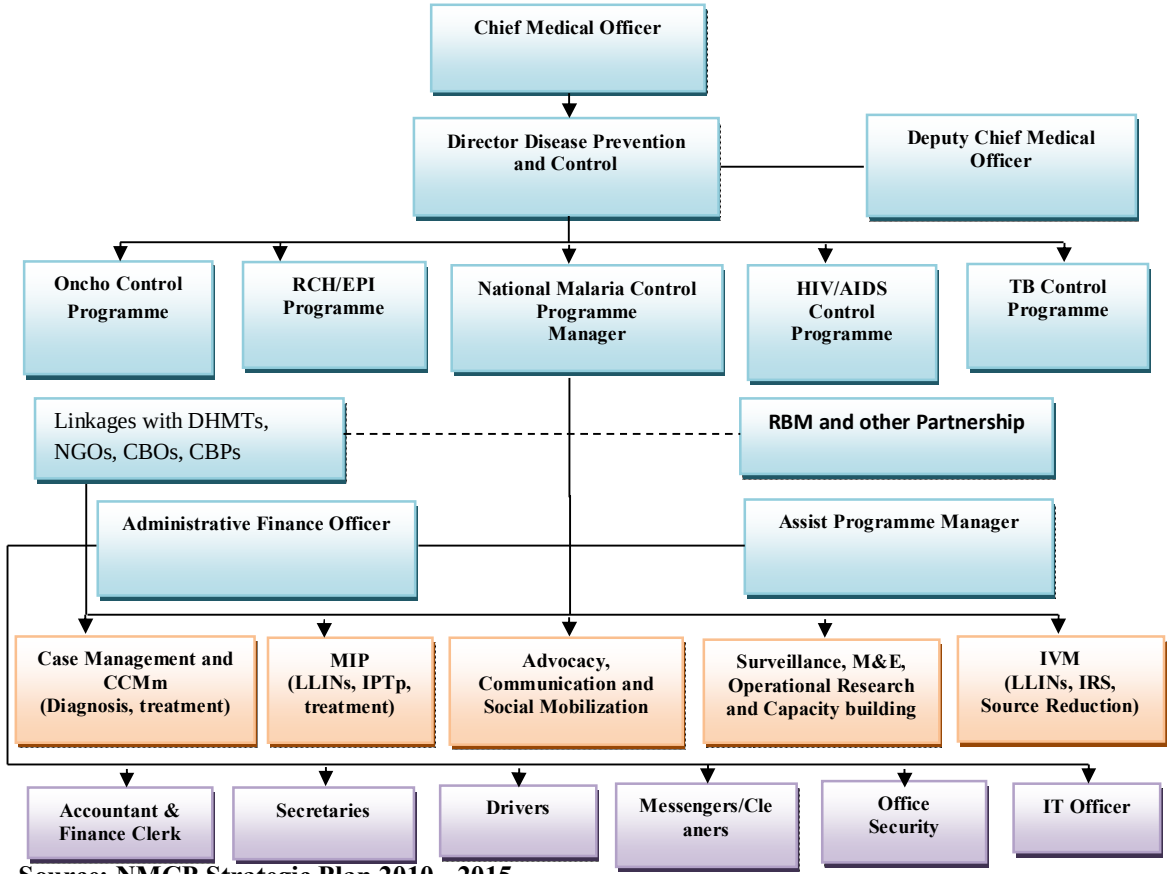
The health sector had adopted an integrated approach to delivery of health interventions. Access, quality and coverage of health service, preventive care, clinical care and emergency services are all important aspects of health service delivery system. As part of the approach, public health interventions are packaged and delivered in communities as part of community health interventions and outreaches, in health centres and in district and national levels.

The NMCP is within the Directorate of Disease Prevention and Control of the Ministry of Health and Sanitation. It is headed by a Manager supported by technical staff, one Accountant, Finance Officer, twelve support staff and two Secretaries.

The mandate has been to plan, facilitate the implementation, coordination, supervision, and monitoring of malaria control activities in an integrated disease control approach. MOHS had a specific budget line item for Malaria that supported the implementation and monitoring of various control interventions such as LLINs, Prompt and appropriate management of cases. To promote partnership, there is a broad based RBM Task Force Committee at the national level while there are District Health Management Teams at the sub-national levels.

Institutional framework of the Ministry of health and Sanitation

Figure 16: NMCP Organogram of the Ministry of Health and Sanitation.



Source: NMCP Strategic Plan 2010 - 2015

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

The district focal persons are part of the NMCP national level human resource and were mandated to report to the DHMTs in which they work. While the district coordinators facilitated capacity building, follow up on activities and financial returns, validate malaria control data and generally enhance implementation of interventions, their activities sometimes create undue demand or apathy on the part of DHMTs thereby creating a seemingly vertical

malaria programme implementation with gaps that could otherwise be addressed by local teams.

Programme Planning and Design

The National Malaria Control Program (NMCP) of the Sierra Leone Health Service plays the leading role in coordinating all implementation activities related to malaria by both development partners and the Ministry of Health.The National Malaria Control Programme is partnering with a number of relevant Directorates, programs and units within the Health sector soliciting their input into malaria control. There is also improved collaboration with other ministries such as Education, Agriculture, Finance and Local Government as well as the CSOs and private sector even though there is room for improvement.

The NMCP has strategic and annual work plans being developed based on sound scientific and operations data. Annual malaria control programme planning cycle included comprehensive consultation and participation at the Central and District levels to ensure alignment of resources with programme goals and feasibility of overall programme objectives.

All levels of the health system have access to programme performance data and rationale for best practices from which to make sound programme implementation decisions.

4.1.4 Human Resources, training and Capacity Development

The sector has developed a National Human Resources for Health Policy and Strategic Plan that guides human resource management in the sector. In the light of this, human resource for malaria control programme management will be examined at the national (central), and district, facility and community levels.

At the central level, the NMCP which is the only unit specifically dedicated to malaria and its related issues is headed by a Programme Manager, who is a Medical Officer with a masterôs degree in Public Health. Sierra Leone malaria control programme also operates focal points covering all the 12 districts. All the district focal persons also double as focal persons for specific intervention areas such as Case Management, Malaria in Pregnancy etc. These constitute the core technical staff of the NMCP. The Programme has a team of administrative staff consisting of Secretaries, Accountant, Finance Officers and drivers.

There is no dedicated staff for Malaria Control Programme at the regional level and district level. Beyond the national level, focal persons are appointed at district level to exercise an oversight responsibility for malaria related activities. The focal persons usually donôt have specific training in malaria control but they join other health workers during refresher trainings on case management or malaria in pregnancy. The organizational structure does not place these focal persons directly under malaria control neither do they receive any additional remuneration for the activities they perform. The turn over of malaria focal persons is on the increase over the past three years at district level.

At the facility level, health workers provide an integrated package of health interventions and are therefore not necessarily ñmalaria staffò; however provision is made to improve their competencies in malaria control interventions through training and refresher trainings.

At the community level there are Community Health Workers (Volunteers) who have been trained to offer some basic services to the community members. Those services may or may not include malaria control activity.

A section of the NMCP staff are permanent employees of the Sierra Leone Health Service while a section were recruited under the Global Fund Grant to support programme implementation at the national level and are therefore not on the government pay roll.

There is a general shortage of trained manpower at all levels of the health system. In a bid to improve the situation, the Sierra Leone government has embarked on a programme of expanding the current training institutions to produce more qualified trained health staff.

Table 2: Malaria Control human resource plan

No.	Area of Work	Staffing Needs	Occupied	Gap
1	Programme management	4	3	1
2	Case management	5	1	4
3	Integrated Vector Management	6	3	3
4	M&E, Surveillance, Capacity building and Operational Research	8	4	4
5	Malaria in Pregnancy	5	1	4
6	IEC/BCC (communication)	5	2	3
7	Support staff	20	16	4
8	Logistics	5	1	4
9	Malaria commodities (forecasting, quantification)	5	1	4

Source: National Malaria Control Strategic Plan (2011-2015)

4.1.5 Financial Management

Reporting

Following malaria related data collection; entry and analysis, which has been integrated into the sector data collection tool, the information derived from the data are interpreted and summarized into monthly, quarterly and annual reports which the NMCP shares with Roll Back Malaria (RBM) partners. The NMCP shares the reports with RBM stakeholders during the quarterly RBM stakeholdersô meetings and yearly ministry of health review meetings. The reports were also used to give feedback to the NMCP, DHMT/Malaria Focal Persons and health workers on their performance with regard to malaria activities. Often this report/feedback was given by way of on-the-job training during supervision visits to the health facilities and/or communities with the desired outcome to improve service provision and utilization.

Global Fund specific technical reports are submitted to the GFATM Principle Recipient(s) who then share it with the Country Coordinating Mechanism (CCM) for their information and action. Other avenues for report sharing are Top Management Team weekly meeting at MoHS.

Financial reporting: Ministry of Health and Sanitation receive funding from Government of Sierra Leone through the Ministry of Finance in accordance with financial regulations and budgeting allocations made to the MoHS. Expenditure of funds disbursed to the NMCP was reported to the MoHS which is in turn reports to the Ministry of Finance. Funds from other donor sources are reported to MoHS and expenditure of all such funds are controlled in accordance with letters of agreement signed with MoHS and the respective donor agencies. Expenditure of all funds is checked by an internal auditor system as well as professional auditing firms.

Flow of funds

In recent times, the greater portion of funds for Malaria control in Sierra Leone has come principally from the Global Fund (GF), and to some extent UNICEF, WHO, the Government of Sierra Leone and other international organizations. In the mainstream health sector, the Government of Sierra Leone has contributed directly through the implementation of the Free Health Care Initiative (FHCI) in the payment of hospital fees and drugs to manage the burden of diseases and ailments in the country. Since 2010, the first year of the FHCI was focused on accelerating access to Health Care for specific vulnerable groups, namely: pregnant women, lactating mothers and children under five years of age.

Funds flow into the system comes in three main ways. One is through The Global Fund in the form of direct transfers to the National Malaria Control Programme (NMCP) to carry out agreed interventions. Some of such funds are transferred to District Health Management Teams (DHMTs) for implementation and also direct to other implementing partners (NGOs). In other cases, earmarked funds from the Government of Sierra Leone flow direct to the Ministry of Health and Sanitation and then to the National Malaria Control Programme (NMCP).

In the third case which has to do with treatment, funds flow directly from the Government or indirectly through donor partners to service providers for the treatment and management of malaria cases among patients. The bulk of the funds have been disbursed to carry out interventions aimed at preventing people from contracting the disease and also reducing the incidence of the disease in the general population. Funds have been spent on interventions like the free distribution of ITNs, procurement and distribution of ACTS, RDTs, LLINs and Laboratory reagents and supplies by The Global Fund through VPP (Voluntary Pooled Procurement).

The methodology used for current and anticipated funding is the Government of Sierra Leone Budgetary Process based on the Government Budgeting and Accountability Act of 2004. The methodology used for current and anticipated funding is the Government of Sierra Leone Budgetary Process based on the Government Budgeting and Accountability Act of 2005.

Spending is incurred at all level of the government from the central to the district (DHMTs) through the 19 Districts Local Councils and the peripheral level (PHUs).

The amounts contributed by the Government are based on the approved budget and are actual disbursements made over the period covered by the budget. The amounts forecasted for future years are indicative figures. They become firm figures in the budget year under consideration. Being part of the approved budget by parliament the figures obviously translates to commitments by government

Management procedures

With sufficient staff and resources in place the NMCP increasingly took the lead in expanding malaria control efforts throughout the country as well as coordinating all activities implemented by the various partners. Additionally the programme advocated for malaria within the Ministry of Health and Sanitation to ensure malaria control efforts are financially supported where possible and fully integrated into the overall health strategic plan.

Strengthening the capacity of malaria focal points at district level was crucial and ensured effective implementation and coordination. These malaria focal points were not only supported through training, but they were also provided with operational and logistical support such as office space, stationary, computers, motorbikes etc.

Financing and Resource Mobilization

The scaling up of malaria programmes intended to reduce the burden of malaria in the country, brings with it, issues of developing and institutionalising the capacities not just for malaria programme, but the health system as a whole, on the methodological, analytical and practical issues relating to the economics and financing of malaria and other health programming. The cost of malaria programme is a function of the targets, level and extent of the interventions. The interventions are themselves a function of the technology and the cost of the technology, especially in relation to effective case management, whereby the medicines and diagnostics may involve considerable costs. Furthermore the mere strategy of scaling up itself requires more resources and better management of those resources.

The NMCP financial management system is synchronised with that of the MoHS. All levels of the health system had financial planning and management plans inclusive of malaria prevention and control related requirements. A financial forecasting and costing framework is in place that provides timely data for planning and budgeting purposes given programme priorities.

4.1.6 SWOT Analysis

The GoSL Strategic framework for service delivery (2007-2011) observed **weaknesses** most of which still remain. These include ineffective communication; most health centres not providing full complement of services; inadequate budgetary provision, inequity in resource allocation and vertical funding of programmes at district level, insufficient monitoring and supervision, reporting system challenges, weakness in accountability to patients and clients, HR production not matching with need with chronic staffing imbalance; Weak public private partnership; Teaching hospitals programmes planning and implementation not linked with that of MoHS.

It also recognizes among others, the following **threats**: Reliance on foreign aid (earmarked donor fund), widespread poverty; poor environmental sanitation and inadequate access to potable water.

Table 3: Summary of Strengths, Weaknesses, Opportunities and Threats, Programme Management

Category	Strengths	Weaknesses	Opportunities	Threats
Policy Formulation	-Established mechanism that prioritises health issues into policy -Malaria Policy informed by a strong national and international research evidence -Guidelines and protocols available to guide policy implementation -Existence of periodic policy and operational review processes	-Inadequate consultation in policy formulation -Inadequate compliance and weak enforcement	-LMIS to improve inventory and service outputs -FHCI to ensure universal access to care and commodities -Availability of NGO Liaison unit within the MOHS for better coordination and resource mobilization	-Dependence on external funds to address key policy issues -Dependence on WHO to drive policy direction -Multiple policy documents with varying sector objectives -Absence of sustainability plan in the face of dwindling GF support and other donors
Organizational Structure	-NMCP team support to districts -Levels of oversight within MOHS and Local Councils -Integration at district & chiefdom levels	-Weak capacity of district teams -Poor information sharing at national and district levels -Overburdened NMCP staff at national level	-Partnership with other programmes and directorates - Established Local Councils	-Weak link between MOHS and district level
Stakeholder Participation &Coordination	- NMCP leadership accessible - Some local and international partners well engaged - Strong RBM coordinating committee - Coordination within MOHS (Districts and Chiefdoms) - NGO and private sector roles recognized - Some TWGs active (ITNs, M&, IEC/BCC)	- Most TWGs inactive (Vector, Case Management) - Weak Public -Private partnership - Weak private sector - weak regulation of the private sector	-Availability of private partners for coordination and partnership - Availability of NGO Liaison unit within the MOHS	- Some malaria control players bypass NMCP and TWGs - Political support for unconventional, wasteful methods by passes malaria control strategy
Human Resources	-A core of well trained staff at national level -Possibility of capacity development for staff -Possibility of technical	-Bureaucratic recruitment process for GoSL paid staff -Temporary nature of donor supported staff	-Contractual engagement of GF supported staff -Availability of technically sound Officers within the entire MoHS structure	-Other competing Public Health Programmes offering better remunerations

Category	Strengths	Weaknesses	Opportunities	Threats
	support from partners -Stable set of technical staff ensures continuity	- inadequate dedicated malaria staff at DHMT/ district level		
Supervision, monitoring and accountability	-Multiple systems for accountability, performance contract, performance review targets -DHIS in all districts -Appropriate indicators and targets -NMCP M&E framework with clearly indicators and -Use of sector-wide indicators	-Overlapping roles and responsibilities -Data quality issues data - Clinicians not confirming cases -Incomplete data particularly from private health facilities - Staff appraisal, Weak LMIS	-Use of sector wide indicators -Existence of DHS, MICS, MIS for independent assessment -IDSR and sentinel sites for data validation	-Inadequate GoSL funds for operations -Inadequate support for integrated monitoring and supervision

Table 4: TA Request

TA source/TA category	2010 – 2013 Implementation Period	2014– 2015 Implementation Period
WHO, UNICEF, RBM	• UNICEF/RBM-TA in capacity building for PMU in areas of PSM, financial & Grant management. • UNICEF/RBM-TA to conduct post LLINs ownership and utilization survey, 2011. • WHO-TA in strengthen M&E system for NMCP, Support IRS implementation, assessment of CCMm and quality control plan for malaria diagnosis, conduct antimalarial drug efficacy and safety study, assessment of malaria diagnostic system in Sierra Leone • WHO/RBM-TA to conduct Malaria Programme Review (MPR, 2013) • RBM/WARN- TA Logistician to support mass LLIN distribution Macro and Micro planning; Macro and micro planning technical support for mass LLIN distribution in Sierra Leone, May 2013.	• TA for PSM to strengthen the PMUôs overall procurement and supply chain management capacities • TA to support/conduct for the surveillance of resistance to ACTs-anti-malaria treatment efficacy & safety study • TA for Bio/chemical assay to study LLIN efficacy and surveillance to insecticide resistance • TA- entomological survey (vector behavior and parasite capacity, etc.) • TA for the design of a private sector distribution of ACTs and RDTs; private sector corporate response to malaria/ resource mobilisation • TA- WHO to provide technical assistance to malaria Programme planning and implementation. • TA- to conduct revision/update national Malaria Control strategic Plan 2016-2020 and Guidelines eg. MIP, case management, LLINs etc. • TA to conduct post LLINs ownership and utilization survey, 2014.
ICF / MACRO	• TA for the conduct of the Malaria Indicator Survey, 2013	• TA for the conduct of the Malaria Indicator Survey, 2015
Academic Inst.	• TA for BCC & IEC	• TA for a barrier analysis for malaria related behavior

.1.7 Problems and challenges

Even though funding commitments for anti-malaria programmes began rising significantly following the launch of the Global Fund in 2002, the WHO in its World Malaria Report 2012 noted that rapid expansion in global funding for malaria prevention and control levelled off between 2010 and 2012 (WHO, 2012). The key issue now is how those funding mechanisms will be topped up amid changes in the way some of these donors operate.

International funding for malaria has plateaued and this funding is well below the level required to reach the MDG targets. Even though many countries have increased domestic funding for malaria control, the total available global funding remains at $2.3bn, which is less than half of what is actually needed.

4.1.8 Conclusions and Recommendations

4.1.8.1 Conclusions and action points

Å There are sufficient opportunities in policy and organizational arrangement that facilitate and promote malaria control interventions.

- There is potentially strong stakeholder participation, partnership & coordination system to facilitate resource mobilization and programmes implementation but this has been limited by the non-availability of the coordinating committee.
- There is adequate human resource with the requisite training and capacity at NMCP, supported by experts from partners to execute malaria control strategy.
- Unfortunately, findings from the field visits indicate that the capacity of the staff at lower levels, to execute malaria control activities is limited and the system is not optimally utilizing the potential of the Primary Health Care concept for scaling up malaria control interventions. A similar finding was observed at some of the referral hospitals where it was realized that some of the health staff were not abreast with current developments in malaria control.
- There is sufficient evidence of monitoring and accountability and efforts are in place to make improvements, but Finance Officers at DHMT level need further training to ensure that they are performing optimally.

Table 5: Synthesis of the NMCP performance in area of Programme Management

Areas	Score				Comments
	3 : High Adequate	2 : Adequate	1 : Present but Inadequate	0 : Inadequate	
Place of Malaria Control in the National Development Agenda	X				
Place of Malaria Control in the Health System	X				
Adequacy of the organisation and management of national malaria control programme		X			

4.1.9.2 Recommendations

The following recommendations are made for proper programme management

- Strengthen the capacity of the National Programme Team and District Health Management Teams to coordinate RBM activities and ensure effective management, supervision and monitoring of service delivery in the districts
- Ensure the functioning of the technical working groups
- Take more steps to improve partnership with the private sector and the Hospitals
- Include and prioritize malaria control activities in the District Local health plans
- Improve integrated supportive supervision to include malaria activities from National to District level and from District level to the Chiefdom/Ward level.
- NMCP should widely disseminate any revision of policies and guidelines in malaria especially clinical health staff both in the public and private sectors.
- Include malaria in the package for pre ï service training institutions and support them as required

Other important information

Policy and Guidance in Financial Management

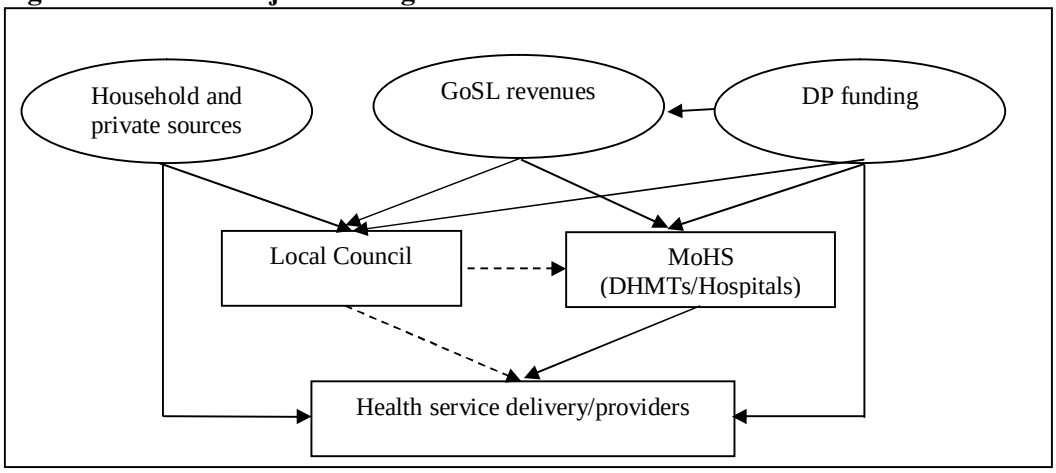
The Government Budgeting and Accountability Act 2005, and the Financial Management Regulation 2007 (FMR, 2007) and the Appropriation Act are the key documents that guide the accounting for funds received and managed in the Sector. Project Agreement Documents and Grant agreement documents are also complied with in the custody, disbursement, accounting and reporting for funds. They provide regulations and guidance on how public funds should be managed including revenue receipts, expenditure, records, audit etc.

Funding the Health Sector

Economics and financing of malaria control and elimination

The three main sources of finance for the health sector in Sierra Leone are the public sector (the Government of Sierra Leone), Development Partners (DPs), and the private sector, including individualsô households.

Figure 5: Flow of major funding sources within the Sierra Leone health sector



Source: Programme Management Team discussions

GoSL funding flows directly to the Ministry of Health and Sanitation as part of annual budget allocation. The GoSL has made several commitments towards increasing support to the health sector especially during the budget speech in 2012 in which the Minister of Finance and Economic Development stated that Government will continue to invest in various aspects of the health sector in order to accelerate progress towards achieving the MDGs particularly MDGs 4 and 5. In this regard, Government is committed to allocate Le 39 billion from the recurrent budget to the health sector. Of this, Le 13.5 billion is to support the Free Health Care Programme; Le 2 billion for the Immunization Programme; Le 6.8 billion for the procurement of drugs and medical supplies; and Le 5.2 billion for primary health services. In addition, Government is also planning to allocate Le34.4 billion to district peripheral health services, secondary and tertiary health care services.

Development partners also contribute significant amount to the ministry through the purchase of drugs and technical assistance to some disease programmes. Although a larger part of the

funds are channelled directly to the Ministry, some Development partners like UNICEF, WHO etc. provide their assistance directly to programmes for activities to be implemented. Private organisations and individuals account for a minute portion of the overall contributions made to the Ministry. These contributions are in turn distributed according to priorities set by government to health service providers working with the Ministry.

Accounting and Reporting

The Principal Recipient (PR), MoHS has a secretariat that coordinates the activities of the global fund supported programmes on behalf of the Ministry. It has a Coordinator who is the Administrative Head and reports directly to the Chief Medical Officer of the Ministry. The secretariat has a finance and Internal Audit unit that coordinates financial activities for the program offices (Malaria and Tuberculosis programmes). Funds are disbursed from the secretariat to the various programmes for implementation based on request from the Programme Managers. These requests are verified by the Senior Project Accountant (SPA), the Head of the Finance Unit at the PRS, in line with laid down procedures including among others availability of funds in the budget, correct budget line and documentations attached, etc. When the request is considered acceptable by the SPA, instructions are given to the Finance Officers to prepare documents for the release of funds. Generally, all disbursement of funds are made through wire transfers to a specialized account maintained by the programmes except in cases where the beneficiary does not maintain an account with a bank, a cheque is draw in the name of the institution or beneficiary to effect payments. This is to ensure that the use of cash payments is kept at a minimum. For funds to be disbursed the supporting documents will have to pass through various senior officials in the Ministry including the Chief Medical Officer, the Permanent Secretary, Director of Financial Resources etc. before the Coordinator and the SPA at the secretariat finally signs on them as being thoroughly vetted and approved for funds to be released. The date, amount, and the entity funds are disbursed to be recorded on the accounting software maintained by the secretariat (Sage Pastel Evolution). For funds disbursed directly to programmes for activities, this will be captured as advances in the software until liquidations are made, which if accepted by the finance officers, are entered in the software to cancel out the advances. At the programme level, there exist a Project Accountant and a Finance Officer to carry out financial responsibilities of the programme. They ensure that financial activities are properly liquidated and advise the Programme Manager on financial matters relating to the programme. Both officers are answerable to the SPA who supervises and directs their work. The Internal Auditor at the secretariat usually does a control visit at the various programmes unannounced to check the adequacy of controls and make recommendations to the coordinator and also ensures that returns submitted by programmes and DHMTs are in line with acceptable standards. The secretariat appoints an external auditor (Bertin and Bertin, a local audit firm) to audit the financial statements of the PR and the programme offices and coordinates all audits of the Global Fund supported programmes of the MoHS.

Financial Management Regulations (FMR, 2007) and the Appropriation Act (AA, 2009) are the key documents that guide the accounting for funds received and managed in the Sector. Project Agreement Documents and Grant agreement documents are also complied with in the

custody, disbursement, accounting and reporting for funds. Though adherence to these documents ensures sound internal controls there was no evidence of a documented plan for financial risk management to target more specifically the management of the unique risks associated with malaria funds management given the funding mechanism.

In all District Health Management Teams (DHMTs), authorized bank accounts are opened in line with the FMR 2007. All funds received are lodged into the designated bank account(s) and disbursed from these accounts. All disbursements are approved by the District Medical Officer and one senior official of the DHMTs. Before approval, the finance officer at the DHMT checks to ensure there is a budget available for the activity and whether the budget is approved and all supporting documents attached are complete and accurate. In most cases payment vouchers are pre-audited by internal auditors before the cheques are written.

At the national level, the NMCP uses accounting software (Sage Pastel Evolution) but it is currently not being installed since there are plans for a refresher training to be conducted for Finance Officers. The software is expected to generate cash book details, bank reconciliation statements, variance analysis and financial reports on the level of disbursement made by the secretariat to the programme.. The NMCP is also expected to use the software for budget accounting and budget performance monitoring of key activities under the program.

At the district level, funding received and disbursed for malaria activities are reported on as part of the standard financial reports of the Global Fund as prescribed by the PR Secretariat. On completion of an activity, the finance officer is expected to assemble all the reports, technical and financial including cash analysis, bank statements etc for submission to the secretariat. Financial reports from NMCP are prepared separately and submitted directly to the PR Secretariat on a quarterly basis. These reports contain schedules on funds disbursed to the programme, amounts transferred to the districts for the implementation of malaria activities and returns from activities implemented.

Internal financial reports are also prepared and sent to donorôs assisting the programme. In the case of the NMCP, reports in the form of template are prepared and sent to UNICEF, WHO, etc. following activities implementation and any balance duly reported. This ensures that there is full accountability for the use of funds and make way for subsequent requests to be honoured.

Internal Audit

The Directorate of Internal Audit at the Ministry of Finance and Economic Development is the regulatory body that is responsible to coordinate internal audit activities with Government Ministry, Department and Agencies (MDAs). The directorate is represented in all MDAs including the Ministry of Health and Sanitation by an Internal Auditor who, on a regular basis, conducts internal audit activities to ensure compliance to internal controls in the management of the funds for government and donor funded activities in the Ministry. At the Ministry of Health and Sanitation, there is a director of Internal Audit who supervises the Internal Auditor recruited by the Global Fund and approves work plan submitted by her. The team of internal Auditors at the Ministry perform quarterly review of the operations and

activities supported by the Global Fund at the secretariat and programme level and report on their findings to the Chief Medical Officer representing the Ministry.

The Global Fund also has a local fund agent who conducts a review of reports produced by the NMCP before they are submitted to the Global Fund in Geneva. In addition the Global Fund has an internal audit department located in Geneva that conducts internal audits of The Global Fund Grants in countries.

External Audit

The Ministry of Health undergoes an annual audit. The audit is a statutory audit and is carried out jointly by the auditor general and an independent audit firm. All funds, including funds for malaria, under the Ministry are subject to the audit. However, for funds from the Global Fund, they are subject to two audits. The statutory audit and another separate audit carried out by an independent audit firm. Currently the statutory audit of the financial statement for 2012 is ongoing and is carried out by the Audit Service Sierra Leone while the consultancy services including the preparation of Financial Statements for NMCP by Bertin and Bertin has been completed and a draft audit findings presented for discussions.

Organization of Financial Unit

There is a Directorate of Financial Resources at the Ministry of Health and Sanitation at the Ministry level responsible for financial management of all funds in the Ministry Health and Sanitation. In addition, financial officers have been recruited and attached to all the 13 district offices to manage and report on funds transferred to the DHMT including funds transferred by the NMCP for malaria control activities like the World Malaria Day, outreach services etc. as part of the overall integrated financial management system at that level.

Human resources, training and capacity development

The Ministry of Finance and Economic Development (MoFED) in partnership with the Institute of Public Administration and Management (IPAM), University of Sierra Leone have been developing short courses and trainings as a way of building the capacity of non-financial managers at Middle Management level (MML) in the management of funds allocated for their programmes. As part of this exercise a periodic assessment of the eligibility of MML to manage their own funds is carried out through refresher courses followed by written examinations conducted by the Institute. Successful managers are awarded certificates of merits and later promoted to another scale.

Budgeting and Planning

Budget preparation at the Ministry of Health takes into consideration the funding expected from GOSL and donors. Malaria is classified under communicable diseases in the MoHS cost centre. At the district level up to the national level, the budgets, which are based on the MTEF, do not explicitly capture expected resource and allocations for the prevention and control of the disease.

Detailed budgets for Global Fund Malaria activities are prepared mainly by the MoHS as the Principal Recipient in collaboration with the NMCP and approval by the Global Fund.

The GoSL has also set up the IHPAU within the MoHS, functional as of 1st July 2013.The IHPAU will be a project management and coordination agency for all donor projects for which the MoHS is the lead implementing agency on behalf of the GoSL. The IHPAU will take over the management (fiduciary, procurement and monitoring) of the MoHSô malaria grant (in addition to other Global Fund portfolios). The current Program Management Unit will be reorganized and some staff will be incorporated into the IHPAU, while others will be moved to the NMCP and the DPC.

By streamlining its management of the Global Fund grants, the MoHS will increase accountability, transparency, and ownership. The IHPAU management committee will be headed by the Minister of Health and Sanitation and will be staffed with highly experienced experts recruited in collaboration with development partners. This will improve oversight on management of funds. It is expected that operational costs for IHPAU will present value for money as the cost share mechanism is put in place where other donors contribute to such costs.

Performance indicators and targets

The following are some of the key financial performance indicators of the MOHS which is also relevant to NMCP:

- % Total gouvernement expenditure on Heath
- % Recurrent spending on districts and below
- Per Capita Expenditure in US$
- % Non-wage recurrent expenditure at district level to total recurrent expenditure
- %Total government expenditure on health as a % of GDP

Financial Management

Flow of funds for malaria activities

In recent times, the greater portion of funds for Malaria control in Sierra Leone has come principally from the Global Fund (GF) and to some extent UNICEF, WHO, World Bank, the Government of Sierra Leone, and other international organizations. In the mainstream health sector, the Government of Sierra Leone has contributed directly through the implementation of the Free Health Care Initiative (FHCI) in the payment of hospital fees and drugs to manage the burden of diseases and ailments in the country. Since 2010, the first year of the FHCI was focused on accelerating access to Health Care for specific vulnerable groups, namely: pregnant women, lactating mothers and children under five years of age.

Funds flow into the system comes in three main ways. One is through The Global Fund in the form of direct transfers to the National Malaria Control Programme (NMCP) to carry out agreed interventions through the Principal Recipient Secretariat. Some of such funds are transferred to the District Health Management Teams (DHMTs) for implementation and also directly to other implementing partners (Sub Recipients and Sub Sub Recipients). In other cases, earmarked funds from the Government of Sierra Leone flow directly to the Ministry of Health and Sanitation and then to the National Malaria Control Programme (NMCP).

In the case which has to do with treatment, funds flow directly from the Government or indirectly through donor partners to service providers for the treatment and management of malaria cases among patients. The bulk of the funds have been disbursed to carry out interventions aimed at preventing people from contracting the disease and also reducing the incidence of the disease in the general population. Funds have been spent on interventions like the free distribution of ITNs, procurement and distribution of ACTs, RDTs, Laboratory reagents and supplies, by The Global Fund through VPP (Voluntary Pooled Procurement).

Sources of Funding

Total estimate of the 5- year strategic plan of the NMCP was $230,687,351. This is from all sources.

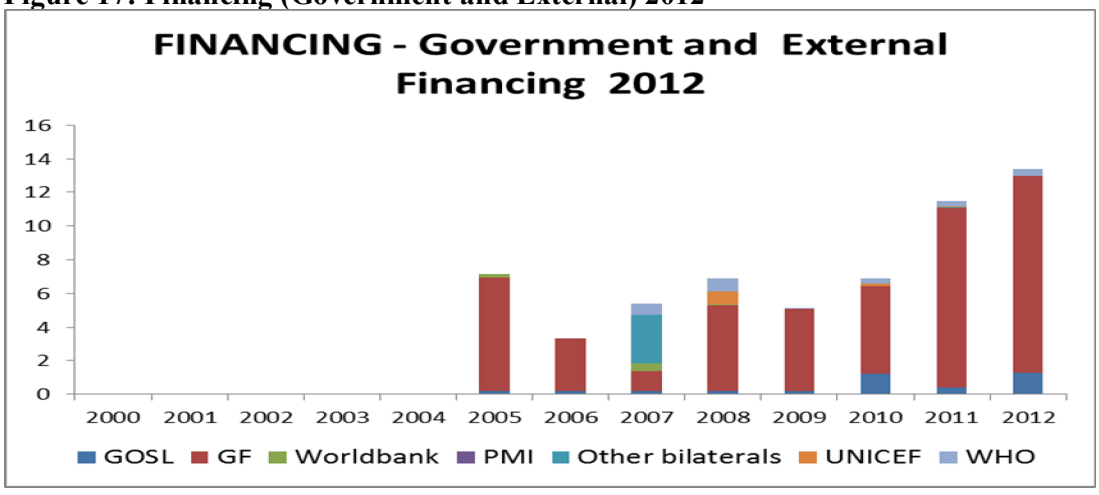
Table 6: Expected Contributions by Partner (Available/Pledged) –NMCP Strategic Plan, 2011-2015

Source	Total Amount (USD)	%
Government	4,997,074.1	16%
Global Fund	24,616,709	80%
UNICEF	920,652	3%
Logistics Solution/African Minerals	7,019	0%
Child Fund and TROCS	1,719	0%
WHO	309,378	1%
Tony Blair Foundation	1,739	0%
PLAN Sierra Leone	7,866	0%
Concern Worldwide	3,681	0%
Total	**USD30,865,837.1**	**100%**

Source: NMCP/MoHS Financial records (2011-2015)

Total domestic sources expected contribution was 16% whilst external sources were to contribute about 5%. The Global Fund contribution over the period was expected to be 80% of the total (see bar chart below).

Figure 17: Financing (Government and External) 2012



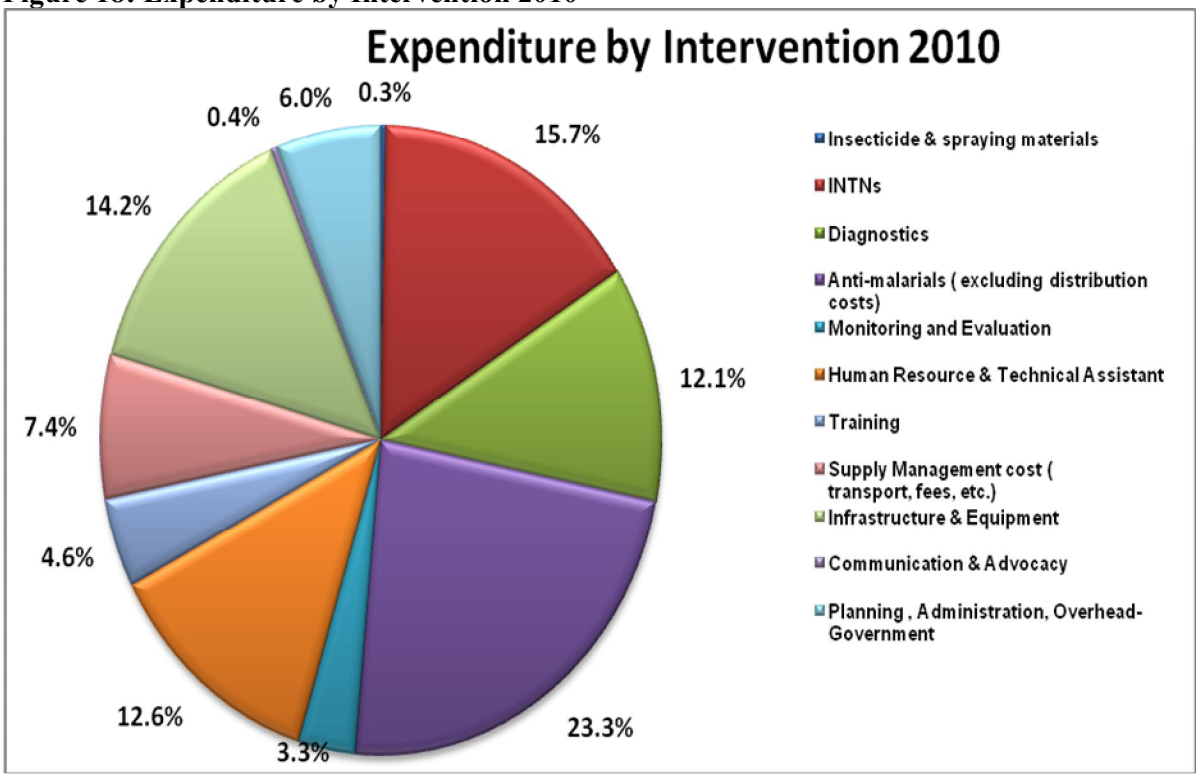
Sources: MoHS/NMCP Financial Report 2012

Table 7: Financing (Government and External) 2012

Year	Global Fund	UNICEF	WHO	The World Bank	DFID	Government	Other Bilateral Partners
2005	6,784,566.00			191,833.00		158,667.00	
2006	3,155,047.00					174,533.00	1,047,500.00
2007	1,187,379.00		650,000.00	460,620.00		164.00	2,950,000.00
2008	5,126,487.12		778,590.00	5,141.00		180,551.72	
2009	4,884,763.11	26,413.00	46,086.21			198,586.21	
2010		137,255.00	302,880.00			1,198,629.00	
2011	10,669,010.00	43,261.00	329,667.00			404,235.00	10,478.00
2012	11,763,088.00	2,812.00	430,000.00			1,231,395.00	
Total	**43,570,340.23**	**209,741.00**	**2,537,223.21**	**657,594.00**	**0.00**	**3,546,760.93**	**4,007,978.00**

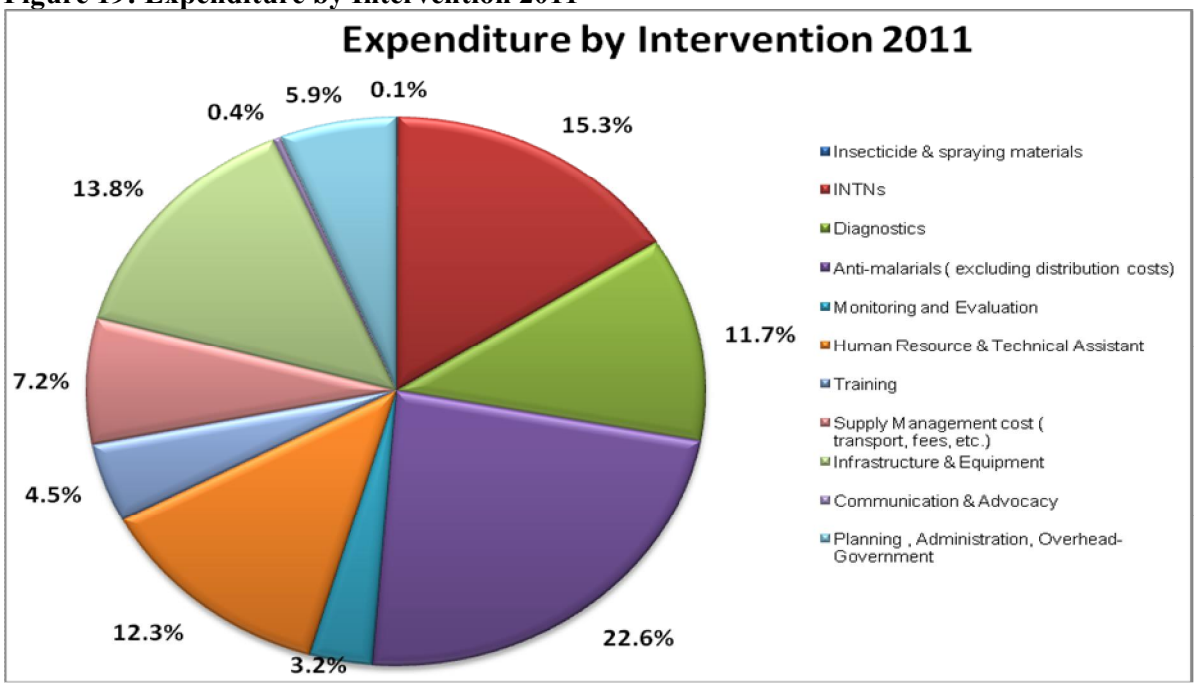
Source: MoHS

Figure 18: Expenditure by Intervention 2010



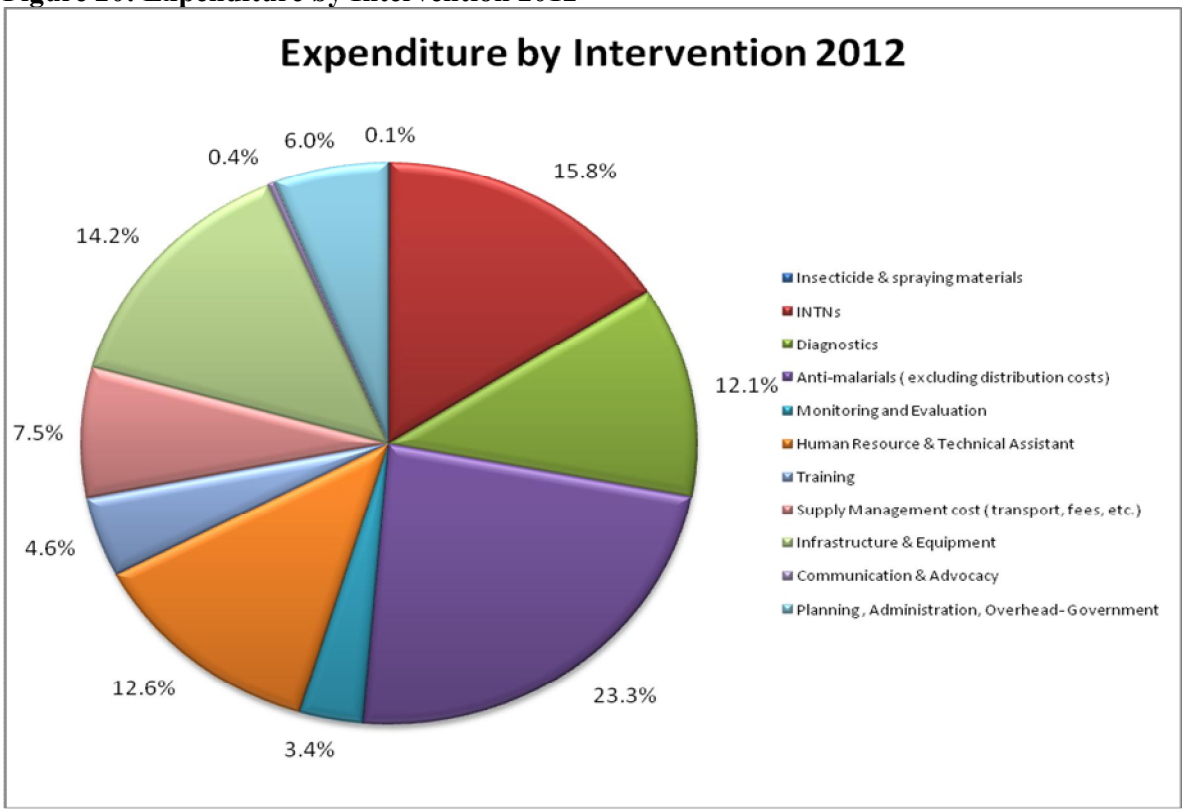
Sources: MoHS/NMCP Financial Report 2010
World Malaria Report 2011

Figure 19: Expenditure by Intervention 2011



Sources: MoHS/NMCP Financial Report 2011
World Malaria Report 2012

Figure 20: Expenditure by Intervention 2012



Sources: MoHS/NMCP Financial Report 2012
World Malaria Report 2013

Expenditure

The total estimated budget for Round 4 funding from Global Fund was $8.8m with actual expenditure for this period (2005-2008) being $8.9m. The expenditure for health products and health equipment was the highest at 34%.

Table 8: Expenditure for Global Fund Round Four (4) by cost category

No.	Cost Category	Expenditure (USD)	
		Year 1 Total	Year 2 Total
1	Human Resources	42,500	125,000
2	Drug efficacy Monitoring	107,088	116,924
3	Training	434,590	836,645
4	Commodities/Products	1,407,145	133,004
5	Drugs	2,123,054	24,000
6	Research	351,265	50,400
7	Infrastructure and Other Equipment	844,590	155,350
8	Planning and Administration	1,071,339	1,063,229
Total		**6,381,571**	**2,504,552**

Source: MoHS/Global Fund Round 4 Grant (2005-2007)

Table 9: Expenditure for Global Fund Round Seven (7) by cost category

Cost Category	Budget (USD)	Expenditure (USD)	Total Variance	% Expenditure (USD)
Human Resources	1,498,401.00	656,175.00	842,226.00	8%
Technical Assistant	407,875.00	-	407,875.00	2%
Training	1,717,796.00	1,058,393.00	659,403.00	9%
Health Product and Health equipment	6,846,361.00	4,540,558.00	2,305,803.00	37%
Medicines and Pharmaceutical products	3,636,668.00	1,783,711.00	1,852,957.00	19%
PSM	744,190.00	820,487.00	-76,297.00	4%
Infrastructure and other equipment	577,277.00	323,305.00	253,972.00	3%
Communication materials	445,531.00	332,746.00	112,785.00	2%
Monitoring and Evaluation	1,767,513.00	947,332.00	820,181.00	9%
Living support to clients/target population		-	0.00	0%
Planning and administration	338,566.00	275,221.00	63,345.00	2%
Overheads	754,598.00	548,763.60	205,834.40	4%
Others		28,322.40	-28,322.4	0%

TOTAL	**18,734,776.00**	**11,315,014.00**		**100%**

Source: MoHS/Global Fund Round 7 Grant (2008-2010)

Table 10: Expenditure for Global Fund Round Ten (10) by cost category

Summary budget by cost category	Year 1 (5 Months ending 2011)	Year 2 (2012)	Year 3 (2013)	Total for Phase 1	% Expenditure (USD)
Human Resources	194,740	472,645	435,780	**1,103,165**	4.4%
Technical & Management Assistance	460,000	917,940	-	**1,377,940**	5.5%
Training	148,175	509,711	291,577	**949,463**	3.8%
Health Products and Health Equipment	894,852	3,225,261	4,236,676	**8,356,789**	33.6%
Pharmaceutical Products (Medicines)	1,406,585	2,684,113	2,801,993	**6,892,691**	27.7%
Procurement and Supply Management Costs (PSM)	255,160	826,720	876,634	**1,958,514**	7.9%
Infrastructure and Other Equipment	183,277	1,569,893	46,460	**1,799,630**	7.2%
Communication Materials	15,450	43,445	8,222	**67,117**	0.3%
Monitoring and Evaluation (M&E)	234,094	363,779	252,455	**850,328**	3.4%
Living Support to Clients/ Target Population	-	-	-	**-**	0%
Overheads	160,085	412,408	369,008	**941,501**	3.8%
Planning and Administration	93,540	234,522	225,387	**553,449**	2.2%
Total	**4,045,958**	**11,260,437**	**9,544,192**	**24,850,587**	**100%**

Source: MoHS/Global Fund Round 10 Grant Phase 1(2010-2013)

Table 11: Analysis of Budget Support by Global Fund

Years	Grants	Budget Amount	% Increase	% of Total
May 2005	SLE-405-G03-M	8,886,123.0		17.2%
May 2008	SLE-708-G05-M	18,734,776.0	53%	36.4%
August 2011	SLE-M-MOHS	23,901,996.0	22%	46.4%
Total		**51,522,895.0**		**100%**

Source: MOHS/GF Rd4 Grant Phase1 / Rd7 Grant Phase1/Rd10 Grant phase1

Table 12: Budget disbursement request versus actual

Years	Grants	Budgeted Amount	Amount Disbursed	Variance
May 2005	SLE-405-G03-M	8,886,123.0		
May 2008	SLE-708-G05-M	18,734,776.0		
August 2011 - 2013	SLE-M-MOHS	23,901,996.0		
Total		**51,522,895.0**		

Source: MOHS/GF Rd4 Grant Phase1 / Rd7 Grant Phase1/Rd10 Grant phase1

Conclusions

Malaria is not only a health problem but also a developmental problem in countries of the African Region. It places significant financial hardships on both households and the economy. The burden of malaria is therefore a challenge to human development, manifesting itself as a cause and consequence of under-development.

There is very limited study on costing and economic impacts of malaria at household level and this can be attributed to the limited availability of suitable data and information of malaria morbidity and mortality due to climate change as well as variation in methods and approaches to estimate and quantify the costing and impacts of the disease. There is also limited study on economic impact of malaria by socio-economic status of households and especially its impact on the poorest.

Evidence from macroeconomic studies show that malaria has a negative effect on real GDP growth; growth per capita from 1965-1990 for countries with intensive malaria has been 0.4% per year, while average growth for other countries has been 2.3%, over five times higher. Areas with intensive malaria are almost all poor and continue to have low economic growth. The geographically favoured regions that have been able to reduce malaria have grown substantially faster afterwards.

We can conclude from the financial management assessment that there exists limited internal financial support for the prevention, control and management of malaria cases in Sierra Leone. The bulk of the supports for such activities are from external sources and this poses challenges to the sustainability of the key interventions that are being implemented currently.

The current financial crisis has made future commitments uncertain, especially from the Global Fund, the main donor for malaria. This funding crisis represents a window of opportunity for malaria endemic countries like Sierra Leone to invest more in health and make their own contributions towards healthy populations.

Finally, the software SAGE PASTEL recommended to be used by the NMCP at the national level is a good software, however, its current utilization is sub-optimal.

Recommendations

The following are some policy recommendations that are proposed:

1. Better information on economic impact is required to identify the population groups and regions most at risk of adverse economic effects. Studies are especially required on the impact of malaria on economic sectors, such as mining and quarrying, manufacturing, building and construction, commercial large-scale agriculture, tourism, and general commercial services
2. Translate high political commitment to increased funding up to Abuja target of 15% minimum, taking opportunity of mining companies.
3. Though there exist a strategic plan on malaria in Sierra Leone, stringent efforts must be made to develop a financing strategy for malaria prevention, control and management in Sierra Leone. This would address threats to sustainability since funding would become more reliable and predictable.
4. All annual plans and budgets on the disease must be coordinated to make more efficient use of resources.
5. It is vital that the government develops innovative funding mechanisms to improve domestic investments in malaria control.
6. The corporate sector can support to bridge the funding gaps in host communities.
7. Since the cost of malaria treatment is well beyond the means of the poorest household there is a need strengthen the implementation of the policy to make access to effective treatment a priority for the most vulnerable groups.
8. Regular capacity building programs must be organized for all finance staff especially those working on projects. As a matter of urgency, everything must be done to come to an agreement and a conclusion on the outstanding financial issues on some of the PUDRs.
9. Internal audits at all levels must be encouraged post audit exercises of malaria funds management rather than pre-audit. Pre-audit compromises the independence of the internal auditor if the same person or unit has to conduct a post audit in a subsequent period.
10. There is also the need to document a financial risk management plan and implement same for the NMCP.

4.2 Procurement and supply chain management

4.2.1 Policy

Sierra Leone has the National Malaria Control Policy and National Medicines Policy 2012, National Malaria Strategic Plan (2011-2015) and Essential Medicines List which is made up of the selected medicines that should be quantified and procured. National Standard Treatment Guidelines, the Sierra Leone Logistics Management Information System (LMIS) SoP manual 2010.

In 2010, the president launched the free health care initiative for pregnant and lactating women and children under five years.

The pharmacy and drug act 2001 is currently under review and is responsible for the regulation of all medicines coming into the country.

Rapid national scale up of malaria prevention and control efforts resulted in additional stress on the national procurement processes and capacity. Procurement Supply Management (PSM) has been integrated into the mainstream PSM in the Ministry of Health and Sanitation.

Commodities are purchased in a cost-efficient manner, abiding by Global Fund and Government guidelines and specifications.

The focus on prevention interventions resulted in large shipments of non-drug commodities that required transport, storage and inventory management at all levels of the health system. The ability to efficiently deliver commodities to community delivery points was crucial to effective programme implementation. MoHS/NMCP and the National Public Procurement Unit are working to identify and address supply chain management constraints in concert with health development partners and develop solutions to constraints in the current system.

4.2.2 Guidelines

According to the National Malaria Strategic Plan (2011-2015), National Malaria Control Policy 2010 National medicines policy 2012 and National Standard Treatment Guidelines 2012 show the malaria commodities that are currently being used for interventions are:

- Antimalarials: For uncomplicated malaria, the first line is Artesunate and Amodiaquine, Artemether and Lumefantrine as an alternative and the second line is oral Quinine plus Tetracycline or oral Quinine plus Clindamycin or oral Quinine plus Doxycycline.
- Sulphadoxine /Pyrimethamine (SP) is used for prevention of malaria in pregnancy.
- For severe malaria, Injectable Quinine is the medicine of choice and parenteral Artemether or Artesunate is use as an alternative.
- Rapid Diagnostic Test Kits for malaria case confirmation,
- Long Lasting Insecticide Treated Nets (LLINs) for vector control
- Indoor residue spraying (IRS)

The supply chain of Malaria commodities has been integrated into that of the national system which is managed by the Directorate of Drug and Medical Supplies (DDMS). The DDMS supply chain system consists of a Central Medical Store in Freetown and thirteen District Medical Stores (DMS) which supply the service delivery facilities. The lower level health facilities i.e. the Peripheral Health Units (PHUs) rely on the District Health management Team (DHMT) for the transportation of their commodities. Information on consumption and stock balances etc. also flow from the service delivery points through the districts then to the central level

4.2.3 Registration of products

According to the Pharmacy and Drugs Act 2001, Pharmacy board of Sierra Leone (PBSL) is mandated with the regulatory responsibilities of all products coming into the country and pharmaceutical premises within the Sierra Leone.

Registration of all medicines is done by the Pharmacy Board of Sierra Leone after submission of the required dossiers of the product and payment of approved fees.

4.2.4 Specifications

The National Medicines Committee (NMC) of the MOHS is responsible for product selection for all Pharmaceuticals and the development of the Essential Medicines List of Sierra Leone and Standard Treatment Guidelines. The committee comprises of specialists from various

sectors of the health system including programmes such as Malaria, Tuberculosis and HIV/AIDS.

The development of the National Essential Medicines List is based on WHO recommendations with consideration on Safety, Quality, Efficacy and Affordability and in addition determining the level of health care at which a particular medicine or dosage form will be used. The Sierra Leone Essential medicines List was reviewed in 2012.

The selection of LLINs is carried out by the Ministry of Health and Sanitation based on the WHO WHOPES guidelines. WHOPES comprises of a four-phase evaluation and testing programme, studying the safety, efficacy and operational acceptability of public health pesticides and developing specifications for quality control and international trade. (http://www.who.int/whopes/recommendations/wgm/en/).

The selection of RDTS is also carried out by the Ministry of Health and Sanitation and is based on WHO 2011 recommendations for the selection and procurement of Rapid Diagnostics Tests for Malaria and the Operational Manual for Universal Access to Malaria Diagnostic testing.

Challenges exist in ensuring that selection of products for procurement within the public sector is aligned with the National Malaria Policy. There are still cases of procurement of monotherapy formulations such as chloroquine for management of uncomplicated malaria.

Selection of products procured by the GoSL is conducted in line with the National Malaria Policy. Challenges also exist with products that are donated as the National Donation Guidelines have not been reviewed since 2003 and their implementation is not enforced and monitored on a regular basis.

4.2.5 Quantifications

Methods exist for the selection and quantification of commodities. The criterion for selection of antimalarial commodities is guided by policies and guidelines in place, for management of malaria. Two major methods are used in estimating requirements; the morbidity method and the consumption method.

The MoHS has a Health Commodities Logistics Committee that is responsible for compiling data used to forecast and quantify the national needs for Health Commodities and provides guidance to the national level.

Forecasting and quantification of malaria commodities at the NMCP has been carried out for using the morbidity method. The central medical stores has been using the consumption base quantification from the limited data received and are adjusted for procurement. The National Pharmaceutical Procurement Unit also carried out a quantification of malaria commodities based on the available consumption data (2012-2013) for comparison purposes.

Due to the limited availability of accurate and timely consumption data for the Malaria commodities and the availability of up to date morbidity information, the Morbidity based quantification was selected. This was done in order to ensure the availability of sufficient

commodities and avoid the interruption of service delivery. The quantification is done annually.

The following targets for intervention were used to carry out the quantification exercise:

- 80% of all age groups to receive prompt and effective treatment of confirmed malaria by 2016
- 90% of all pregnant women to receive at least two doses of IPTp.
- Maintain universal coverage of Long Lasting Insecticide Treated Nets (LLINs).

4.2.6: Procurement, storage and distribution

Procurement

Most of the procurement practices for malaria commodities are driven by donor support mostly global fund since 2004. Only drugs from the National Essential Medicines List (EML), National Malaria Control policy and the Standard Treatment Guidelines (STG) were selected.

The MoHS is responsible for the selection of products, technical specifications and will provide the relevant input into the quantification and forecasting activity.

The actual procurement of health commodities for global fund assisted project has been carried out by the VPP and the non-health by United Nations Operations (UNOPS). The GoSL has also set up the Integrated Health Project Administration Unit (IHPAU) within the MoHS, which will be a project management and coordination agency for all donor projects for which the MoHS is the lead implementing agency on behalf of the GoSL. Following assessment by the Local Funding Agent (LFA), the IHPAU will take over the PSM of non-health for the GFATM grants in addition to the fiduciary and monitoring aspects.

For the commodities procured by the GoSL, the activities are guided by the national public procurement act 2004.Generally all procurement methods are determined by the volume of money involved normally called thresholds. The following methods are generally used by the Ministry which include but not limited to International Competitive Bidding (ICB), National Competitive Bidding (NCB) and National Shopping or Request for Quotations (RFQ). For the Ministryôs procurement of health commodities, the following steps are followed:

1. Development of the list of items by the NMCP and the Directorate of Drugs and Medical Supplies.
2. Based on the volume of money a procurement is decided, for all the past procurements activities by the ministry it has been international competitive bidding.
3. Advertisements are made globally for a specific period of time, normally six weeks for ICB.
4. Bids are opened publicly in the presence of Bidders or their representatives and Evaluation Committee is set by the Procurement Committee of the Ministry to evaluate the bids and make award recommendation for the most responsive bid to the Procurement Committee. Contract awards are made after the approval of the Procurement Committee. The Ministryôs Procurement Unit does the contract management until all deliverables are made to the Central Medical Stores for onward distribution.

Funds are also been disbursed to hospitals and DHMT for the procurement of medicines.
There is no central clearing unit in the ministry and therefore it is dependent on who is doing the procurement. Clearance of Global Fund malaria commodities is done by a VPP Clearing Agent (UPS). Tracking sheet for shipment and SoP for clearance of all procured malaria commodities and has been developed.

Since most of the procurements (Donor supports) are not done by the programme or the MoHS, there is a gap in the capacity of the procurement personnel.

Some donors such as the NGOs and faith based organizations that directly target the primary health care units also procure and they do not adhere to the donation guideline laid down by the MoHS.

There is lack of oversight from the Ministryôs Procurement Unit on the guidelines the district council and the hospitals used for procurement therefore making it difficult to follow-up on their procurement practices and ability to achieve value for money.

Storage and distribution

In a perfect pipeline, all products are stored under ideal temperature and humidity conditions and according to proper storage guidelines. In reality, the quality of storage conditions may vary widely from place to place.

There are storage facilities at all levels and the program has integrated to the national system and is therefore using the central and district medical stores for storing malaria commodities. There is also coordination with other programmes (NAS), partners (UNICEF) to identify and utilize facilities for storage.

At national level, the Health Commodities procured are stored at the Central Medical Stores. The District Medical Stores, Tertiary and Secondary Hospitals received quarterly supplies from CMS and Peripheral Health Units received monthly supplies from DMS. In order to ensure that heath facilities and districts have enough commodities to avoid excess stock, stock levels are set as follows:

Table 13: Minimum and Maximum Stock Levels

Level	Minimum Stock Level (Months of Stock)	Maximum Stock Level (Months of Stock)
Central	9	15
District	3	6
PHU	2	3

The current storage facilities are sub-optimal for efficient supply chain operations and will be unable to accommodate and handle the increased volumes that are expected in the future.
The current space available at the CMS is only 10% of the expected future space requirements (NPPU inception report). There is inadequate temperature regulation and the internal layouts of the individual stores make it difficult to manoeuvre and maximize the use of available space.

The NPPU is implementing a phased approach to improve and increase the available space at central, district and peripheral sites which starts with clearing out expired, unusable stock and medical equipment, renovations of existing space and provision of appropriate shelving and racking. This activity is expected to increase the available storage.

Long term plans to ensure adequate storage capacity include the construction of a state of the art warehouse in Freetown to act as a hub for the storage and management of all health commodities.

Distribution of health commodities is carried out on a quarterly basis in conjunction with the Free Health Care Initiative commodities. The FHC risk mitigation matrix is used to monitor adherence to the distribution plan and to Good Distribution Practice.

The distribution network of health commodities consists of Central level Stores, 17 District and Regional level Stores, 1,125 PHUs, 34 Public and Private Hospitals/Clinics and 6670 Community Health Workers

The current transport operation covering movements from the CMS to DMSs and Government Hospitals is accomplished utilising the CMS fleet supported by additional 3rd party operators as required. Stock from District Stores to PHUs distributed quarterly utilising sub-contracted vehicles.

There are a number of PHUs located on islands requiring a combination of land and sea transport.

The rainy season (May to September) makes some of these service delivery points not easily accessible by vehicle for the delivery of medicines. The favoured method of handling the expected inaccessibility is to increase the stockholding at PHUs to cover this period.

In order to ensure sustainable capacity for distribution to the end user, the National Pharmaceutical Procurement Unit (NPPU) require additional capacity that includes, 5 (five) 18 ton vehicles and 1 (one) 4x4 vehicle type for emergencies and small deliveries at central level and 20 (twenty) 4x4 vehicles for district levels (NPPU storage assessment 2013).

The push system is used for distribution of malaria commodities at the CMS to DMS and from DMS to the PHUs. A pull system is used for the distribution to hospitals and private facilities. Distribution can sometimes been done from the district to the PHUs base on emergency request from the PHU in-charges.

4.2.7 Inventory Management

Inventory related information is provided by the Logistics Management Information System (LMIS) which generates information from the service delivery point to the Central Medical Stores. The system is paper based at service delivery points and electronic at the district and central levels.

The Inventory related system utilises software known as CHANEL which facilitates the capture of data from all locations on a monthly basis including:

- Opening stock
- Receipts
- Dispensed quantities
- Stock adjustments (stock transfers etc.)
- Closing stock

The National Pharmaceutical Procurement Unit will assume the responsibility by the 1st April 2014 of collecting, validating, analysing and utilizing the information to ensure an uninterrupted supply of health products at all levels throughout the supply chain.

LMIS tools and SoPs for reporting were developed and 1,175 health workers including all in-charges of PHUs and some members of the DHMT in the 13 districts were trained in 2012. This has improved the reporting especially at primary health care level although there are challenges with data quality. The constant monitoring of PHU staffs by CRS field agents with support from The Global Fund from the Round 10 Phase 1 Malaria Grant has also helped with the reporting from this level.

Although the LMIS tools have been developed and staff has been trained, there are issues such as incomplete, timeliness of reporting and poor quality of LMIS data to inform forecasting and quantification especially at secondary and tertiary level. There are also challenges with infrastructure for LMIS reporting i.e. inadequate supply of electricity and internet connectivity for transmission of data, and occasional stock out of LMIS tools.
Data collection and sharing are poor among partners. Multiple organizations are involved in supply chain activities, and sharing of data and information is weak (due to a lack of good data systems and coordination).

Inventory management of program commodities including some malaria commodities such as the fixed dose ACT are not included in the present LMIS tools being used.

According to the NPPU IT master plan 2013, the CHANNEL software system was designed for reproductive health and only a small number of products. It does not have easy data upload; each level of the supply chain is separate.

4.2.8 Quality Control

The PR is responsible for ensuring that Quality Control (QC) is carried out in accordance with GFATM and MoHS standards, and ensuring that all shipments from suppliers are physically checked upon receipt. In addition to physical checks, the PBSL will ensure that random samples of ACTs, RDTs and LLINs are collected along different points of the supply chain for the purposes of monitoring the quality of these products.

Other challenges identified in quality control (QC) are as follows:
Å Lack of funding for QC after delivery and through the supply chain
Å No national reference laboratory
Å Difficulties to implement a quality assurance system
The Sierra Leone Pharmacy Board Laboratory is currently not WHO Prequalified and as such Quality Assurance testing will be outsourced to WHO prequalified Laboratories for ACTs, RDTs and LLINs. The PBSL has initiated the process to achieve WHO Prequalification status

for its Laboratory and is receiving support from the GoSL, the WHO and other technical partners to achieve this.

4.2.9 SWOT analysis

Table 14: Synthesis of the NMCP performance in area of PSM

Areas	Score			
	3 : High Adequate	2 : Adequate	1 : Present but Inadequate	0 : Inadequate
There is a system in place for supply chain management that ensures no stock outs of products		X		
There is system of PSM with written SOPs that is adhered to		X		
System in place for procurement	X			
Quality of ACTs and RDTs constantly monitored		X		
There is a functional PV system			X	
Availability of national centre and technical committee on PV			X	

4.2.10 Successes, best practices and facilitating factors

The integration of the NMCP into the national supply chain system

There is availability of policy documents and guidelines, LMIS tools and SoPs with trained staff on the use of these tools and inventory management. There are storage facilities at all levels of the supply chain and coordination with other programmes e.g. National HIV/AIDS Secretariat (NAS) and partners e.g. UNICEF to identify and utilize facilities for storage.

Development of risk mitigation matrix for distribution which minimise the discrepancies involving with distribution and there is good coordination between partners involve in the matrix at central and district levels.

Availability of reference materials e.g. Standard treatment guideline, national formulary EML training manual etc. and the setting up of the drugs and therapeutic committee (2013) in the hospitals which aid in the rational use of medicine.

The QC assessment and testing of all products coming into the country is a pre-requisite by the Pharmacy Board of Sierra Leone. The prescribing/dispensing of antimalarial is based on;

- Confirm diagnosis;
- Coordinated planning of distribution with stakeholders such as UNICEF, NPPU etc.;
- Distributions from central to district are accompanied by CMS staff;
- The use of completely sealed tracks for distribution;
- Supplies at all levels are issue through the use of channel invoices.

4.2.11 Issues and challenges

- Guidelines of donations outdated and not adhered to by donors that support the primary level.
- Delay in clearing of commodities resulting in artificial shortage.
- Inadequate and poor storage facilities.
- Weak QA/QC system.
- Incomplete and delayed reporting of LMIS data especially at secondary and tertiary level, including stock out of tools.

4.2.12 Conclusions and Recommendations.

1. The desk review and field visits have identified the weaknesses, threats and strength relating to the procurement and supply management of malaria commodities. Opportunities and recommendations were also highlighted.
2. Outdated policy documents and guidelines should be updating and dissemination and user should comply with them.
3. LMIS reporting to be linked to performance based incentives particularly at secondary level
4. Review of LMIS tools to encourage adherence and quality of reporting Better coordination between LMIS stakeholders between central and district level.
5. Use of appropriate institutions such as CMS/NPPU, IPHAU and NPPA to carry out
6. Procurement of commodities. Capacity building of NMCP staff to support procurement
7. Renovation and improvement, and building of new storage facilities and provide with the necessary equipment such as thermometer, handling and packing equipment, fire alarm and extinguishers, electricity supply etc.
8. Responsible persons to take up their responsibilities as described in the risk mitigation matrix for distribution. Timely provision of funds for distribution activity and incentives for staff that are directly involves in the distribution process. Strengthen QA/QC system including monitoring and supervision
9. Adherence of prescribers and dispensers to policies and guidelines. Review of the prescription forms and orientation training in prescription writing. Recruitment and training of more personnel especially in procurement processes and inventory management.

4.3 Malaria vector control

4.3.1 Introduction

The Integrated Vector Management (IVM) remains the core strategy in reducing morbidity and mortality related to malaria in the human population especially among children under five years and pregnant women. The Sierra Leone National Health Sector Strategic Plan (NHSSP) fully recognises the potential of IVM noted in the policy guidelines (2010-2015) in effectively reducing and interrupting the transmission of the main vector borne disease which is malaria. Integrated vector control stands out as a preventive cost effective strategy for malaria control and prevention through the use of Long Lasting Insecticide-treated Nets (LLINs) and Indoor Residual Spraying (IRS). The IVM uses principles of integrated disease control programs, evidence based knowledge of local ecological, entomological and epidemiological situations, cost-effective analysis, sound integration of the available chemical and non-chemical options, in a sustainable, environmentally and economical feasible approach(IVM Policy guideline,2010) .

The introduction of vector control through the National Malaria Control Program (NMCP) was the distribution of ITNs to children under-fives and pregnant women in 2004, through the Measles-Malaria mass campaign in 2006, through the Universal coverage campaign -access to LLINs campaign in 2010 to all households in Sierra Leone, and the routine distribution to pregnant women (ANC) and the children under five years (EPI); itôs good to note that the LLINs distribution as actual utilized the integrated With the financial and technical support of the World Health Organization (WHO) Sierra Leone Office four districts were selected. Chiefdoms/communities in this district were also selected based on rigorous criteria. The IRS operational districts for the two (2) year period are: Bo districts (five Chiefdoms); Bombali district (four chiefdoms); Kono district (five chiefdoms); Western Area rural (twelve Communities). The Indoor Residual Spraying which was initiated in the 1970ôs in Sierra Leone but disappeared has now been in use since 2010.

4.3.2 Policy and guidance

This 2013 program performance review for NMCP Sierra Leone did not stop at providing recommendations to improving the system and the management of malaria disease burden but to harness the fulfilment of the signed Abuja Declaration of the April 2000 and MDG 2015, with the initiative of Roll Back Malaria in Africa. Policy and guidelines have been produced to guide the strategic delivery, currently the program uses the revised version (2010) of NMCP Policy Document; NMCP (2008) Policy guidelines on Insecticide Treated Nets; the National Malaria Control Strategic Plan (2011-2015); Policy Guideline for Integrated Vector Management (2010); the Integrated Vector management Strategic Plan (2012).

Older versions of the documents produced by NMCP are noted below to inform further development, such as: Official launching of the malaria Policy document (April 2000); Official launching of the RBM initiative and formation of the Task Force (2001); Desk assessment of the malaria control program (2001); Approval of tax waiver on mosquito nets, insecticides, anti-malaria drugs (2003); Drug efficacy studies (2002/2003); Situation analysis

(2004);consensus meeting and approval of ACT as a 1st line of drug (2004); Adoption of IPT (2004).

The mandate of the National Malaria Control Program (NMCP) as documented in the National Health Plan (MoHS) is to plan, facilitate the implementation, coordinate, supervise, and monitor malaria control activities in an integrated disease control approach. The NMCP regards and encourages all supporting partners to work in guidance with the policies and documents approved for the dispensation of vector control and prevention interventions in the confines of the Republic of Sierra Leone.

In summary, few of the policy statements and recommendations are explained below:

4.3.3 Organizational structure

The organizational structure of the Malaria Integrated Vector Control is based on the levels of implementation of the activities. At National level an IVM National Steering Committee (NSC) and National IRS task Forces oversee the implementation of the Integrated Vector Management in country. It involves the combination of the National malaria Control Program (NMCP), Neglected Tropical Disease (NTD), the Vector Control Unit, and the Environmental Health Division (EHD); and the Health partners, World Health Organization, Helen Keller International (HKI), Catholic Relief Services (CRS), Plan S/L, UMC, UMCOR, World Vision S/L, and others. Moreover, to promote acceleration of national target of interventions the Technical Working Group (TWG) was established to focus on national advocacy & mobilization of resources; planning the implementation of IVM in collaboration with MDAs; training of trainers at provincial and district levels; review provincial and district reports; monitoring, evaluation and supervision of technical activities at various implementation; procurement, deployment and maintenance of IVM equipment and management of staff; and identification of area requiring operational research and collaborating with research institutes to resolve challenges.

A Specific administrative structure was created comprising the 3 (three) Program Managers of Malaria, NTD and Directorate of Environmental Health, 3 (three) National Supervisors for the same programmes, 5 (five) Vector Control Officers from the Vector Control Unit (VCU). This means that the malaria vector control demands the recruitment of additional staff to accelerate achievement of the impact of vector control interventions.

At the district level, each of the thirteen District Health Management Teams (DHMT) play a vital role in planning, resources mobilization, influencing community participation, training of Primary Health Care workers, and organizing chiefdom or community stakeholder meetings relating to provision of malaria control (diagnosis using RDT or microscopy, treatment using the national treatment guideline, recording and reporting) and preventive services (sues of IPT, LLINs and IRS) for the target populations at any given time of the year. The DHMTs functions with the support of NGOs, FBOs, CSO and District IRS task force, and the Local Councils which serve as the administrative link of the Government of Sierra Leone at each district.

However, the work of the DHMTs are mostly constraint with work of malaria control and prevention which rest on a few people who act as focal points in Malaria (1), the District IRS focal (2 of them) and few District M& E officers. As a result more staff with attractive salary would be needed to work with the DHMT.

The organizational structure of Malaria Vector Control end at the chiefdoms/community level where the foundation of intervention exists through community participation, awareness raising, acceptance, ownership, advocacy, integration of malaria prevention intervention into cultural and societal domain achieve sustainability goals. The chiefdom or community task force at this level have always played pertinent roles in the distribution of LLINs, formulation of bye-laws for potential misuse of the LLINs(other ways other than sleeping purpose), and the Indoor residual Spraying exercise in the four pilot districts.

4.3.4 Human resources, training and capacity development

In terms of human resources, the 3 Programme Managers take the lead at ministry level whilst the NMCP has one National Indoor Residual Spraying Focal Point and One National LLINs Focal Point. The National Integrated Vector Management Coordinator and the M&E component of the NMCP provide regular back-up for the Vector Control Unit although itôs inadequate. At the DHMT level the Malaria Focal Point (1), the District IRS Focal Points (2), Vector Control technicians (5) and the Spray Operators (130) are the main human resources available.

The National IRS focal Point and the Director of Disease Prevention & Control attended a 5 days training on Vector Borne Disease and malaria Crisis management in Ghana, Accra in 2012. Two Environmental Health Staff also received training in Integrated Vector Management in Ghana, Accra in 2010. In addition two vector control technicians were trained in the maintenance of spray pumps and the supervision of IRS in the field.

A total of sixteen (16) DHMT members were trained before the start of the first Indoor Residual Spraying pilot in 2010, eventually they also trained a total of 130 spray operators who were very important to the pilot program. The human resources capacity both at national and district level is considered inadequate especially for scale-up operations of IRS and routine monitoring of LLINs at district and community level. Lack of funds for routine monitoring and the low remuneration paid by government continues to be the challenge in Vector control in Sierra Leone.

The human resources capacity building and maintaining the trained staff is one of the key pending issues that should be resolved for effective implementation of the malaria vector control interventions. The current Staff training needs should focus on short term course in malaria entomology that will address learning skills for effective Insecticide resistance monitoring, vector bionomic, and sporozoites analysis using ELISA test kits.

4.3.5 Annual planning

The current annual plan of the malaria vector control program focus on the LLINs campaign for 2014, routine LLIN delivery to pregnant women at first ANC visit and children under five years for Penta 3; LLINs efficacy studies; vector bionomics (mapping, density, biting & resting behaviour); routine insecticide resistance monitoring; setting & regular update of vector database; supportive supervision of PHU and vector control staff for improved data quality and the scale-up of IRS in the 4 pilot districts and highest malaria prevalence districts in sierra Leone.

Effective partner coordination will be ensured through the Roll Back Malaria task force and the Integrated Vector Management; we also hope stimulating the functionality of the Technical Working Group (TWG) in taking full responsibility of the country agenda for

Integrated Vector Management resources mobilization, advocacy, harmonization of guidelines and tools used for IRS and strengthen partnership and providing training opportunities for national and district level staff.

4.3.6 Service Delivery Outputs and Outcomes

Indoor Residual Spraying

The applicability of Indoor Residual Spraying is beyond the scope of a seasonal level as the IVM policy recommends application both in seasonal and perennial transmission areas with a recognized image of rapid impact on the transmission of malaria. IRS remains to be the magic weapon of vector control when applied (coverage of 85%) to all human dwellings in the targeted spraying communities.

The NMCP and the IVM committee values the implementation of IRS not only as a complementary strategy to LLINs, but to serve as a robust strategy in achieving rapid reduction of malaria transmission in high, moderate or peak transmission periods of malaria disease, more so, in peri-urban, rural (concentrated settlements) and economically important area such as industries with immigrant workers, irrigation schemes, and mines.

The Indoor Residual Spraying (IRS) pilot has been implemented in the four pilot districts with a target of 85% coverage of all sprayable surfaces (walls), itôs good to note that a coverage of 97% was achieved for the four districts during the two rounds of spraying in 2010-2011 and 2012 periods (NMCP/ IRS Final Report, 2012).

The expansion process of the IRS will be spelt out in the final evaluation of the IRS report that will be produced by the WHO consultant very soon. However, the IVM policy guideline already proposes a progressive expansion strategy by 2-3 districts per year to protect 100% of the total households in the selected areas in the country till 2014, participation of the DHMTs and the community members have been part of the best practices Sierra Leone will maintained during future spraying campaigns.

Annual Trend: Indoor Residual Spraying

Indicators Reported In the Past Spraying Periods

A total of 26 chiefdoms/communities out of the 43 chiefdoms/communities targeted by the pilot were sprayed (Bombali 4/7 chiefdoms, Bo 5/8 chiefdoms, Kono 5/8 chiefdoms and Western Area Rural district 12/20 communities).

The spraying exercise were conducted once in a year for the two year period due to financial constraint although two spraying exercise was actually necessary to maintain the potency of the insecticide on the walls sprayed. Annual percentage coverage of the spraying in the four pilot districts showed steady progress in Bombali, Bo and Kono districts, whilst Western Area rural maintained the coverage of 98% for the two years. The achievement by each of the districts in getting over 90% of the targeted spray area is best practice that needs to be maintained (NMCP/ IRS Final Report, 2012).

Long Lasting Insecticide Treated Nets

The Integrated Vector Management Policy guideline states in terms of LLINs distribution as a suitable intervention for the distribution using campaigns, and door to door method, all over the country (rural and urban) and should be complimented by the IRS; the LLINs distribution embraces both moderate, low and high peak transmission seasons of malaria and recommends the use of IRS in all high peak seasons (IVM Policy guideline, 2010).

Protection of the general population from malaria in the entire country is the dream of the NMCP when adequate resources are available. In the case of limited resources, preference of LLINs distribution is tailored to meeting the needs of children under five years, pregnant women and to some extent certain groups like the aged, internally displaced populations, people living with HIV/AIDS. NMCP will ensure that all LLINs delivered by the public sector and its partners be distributed **FREE OF COST** all over the country (IVM Policy guideline, 2010).

Sierra Leone successfully did the Universal Coverage on access to LLINs and ownership campaign in 2010 where a total of 3, 264,927 pieces of long lasting insecticide-treated mosquito nets (LLINs) were distributed to households in every part of the country, with a national target of one net for two people (up to a maximum of 3 nets per household based on an average household size of six people). This was followed by a hang-up campaign to ensure the physical hanging of the nets in sleeping place to stimulate its use by the household population (SL-LLINs, 2011)

The notable methods/channels of LLINs distribution in Sierra Leone are: the Stand-alone LLIN campaign; integrated LLIN campaign; routine LLIN delivery with antenatal services (ANC); routine delivery with Expanded Programme on Immunization (EPI) and Child Health week/days activities. The choice of LLINs that are recommended for procurement, distribution and usage in Sierra Leone are under the WHO Pesticide Evaluation Scheme such as the Olyset, PermaNet 2.0, Interceptor, Duranet, and Netprotect (NMCP ITN Policy guidelines, 2008)

Long Lasting Insecticide Treated Nets

ITNs Delivery Mechanisms

A variety of delivery mechanisms can be explored to accelerate universal access of at risk population to ITNs. This can be achieved through public sector, for profit and not for profit private sector. A cost-effective approach is to distribute the nets to children under 5 and pregnant women integrated with other public health interventions targeting these groups. Proven mass distribution outlets such as the Expanded Programme on Immunization (EPI) and Antenatal Care services (ANC) campaigns successfully implemented in the country demonstrated the potential both to rapidly scale up coverage and to raise awareness of the benefits of using ITNs. The following delivery channels should be considered:

- Integrated ITN campaigns;
- Stand-alone ITN campaigns;
- Routine ITN delivery with Expanded Programme on Immunization (EPI);

- Child Health Week/Days and
- Routine ITN delivery with antenatal services (ANC).

Routine LLINS distributed in Sierra Leone

Distribution is geared towards improving sustained access to Insecticide Treated Nets through the involvement of the public and private sector, NGOs and others. The following are recommended:

- Distribution of **FREE** ITNs to pregnant women,
- Distribution of **FREE** ITNs to children under five,
- Disruption of **FREE** or **highly subsidized** ITNs to all the other groups.

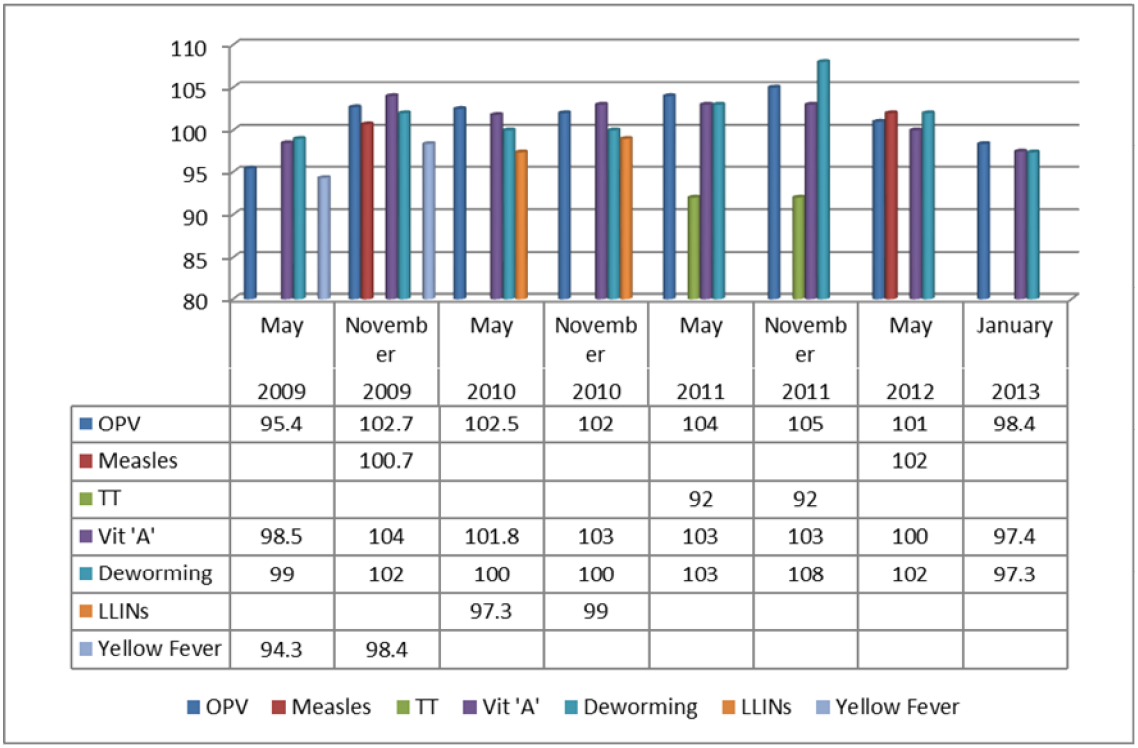
Table 15: ITNs/LLINs distributed by National Malarial Control Programme and Partners

District	Year and Quantity distributed								
	Re-treatable nets (ITNs)		Long Lasting Insecticidal Nets (LLINs)						
	2004	2005	2006	2007	2008	2009	2010	2011	2012
Bo	3,500	17,582	147,634	36,428	21,500	21,860	364,143	3,820	26,054
Bonthe	2,260	10,884	46,553	4,250	0	5,614	173,494	3,064	13,479
Port Loko	3,000	3,700	97,400	18,872	9,695	18,692	361,286	4,944	25,943
Kambia	5,000	1,190	71,000	7,858	0	10,728	257,530	3,056	22,968
Tonkolili	3,330	8,087	79,423	14,270	10,380	13,369	98,782	1,435	6,830
Koinadugu	10,500	10,678	109,271	53,893	6,930	10,567	317,616	3,310	22,139
Pujehun	4,150	10,900	107,886	42,546	3,468	10,680	185,017	2,877	18,628
Moyamba	4,000	900	60,722	10,000	13,234	11,236	273,725	3,500	24,026
Bombali	16,000	11,100	158,067	48,721	8,270	17,019	220,423	2,781	12,868
Kono	19,500	27,257	116,049	47,092	1,602	10,330	177,091	2,786	11,079
Kenema	7,247	20,086	180,723	79,680	0	22,107	239,525	2,869	23,481
Kailahun	3,500	10,780	144,227	73,637	1,711	14,407	188,218	3,401	13,648
Western Area	4,000	6,352	210,854	3,326	0	41,578	755,265	7,990	51,802
Total	**85,997**	**139,496**	**1,529,809**	**440,573**	**76,790**	**208,187**	**3,612,115**	**45,883**	**272,945**

Source: NMCP database

Integrated Mass Campaigns

Figure 21: Coverage of Integrated campaigns from 2009-2013



	May 2009	November 2009	May 2010	November 2010	May 2011	November 2011	May 2012	January 2013
OPV	95.4	102.7	102.5	102	104	105	101	98.4
Measles		100.7					102	
TT					92	92		
Vit 'A'	98.5	104	101.8	103	103	103	100	97.4
Deworming	99	102	100	100	103	108	102	97.3
LLINs			97.3	99				
Yellow Fever	94.3	98.4						

Source: MCHW REPORTS

An Integrated Maternal and Child Health week campaign was conducted in November/ December 2010. This campaign targeted children under 5 years for three interventions including LLINs nationwide.

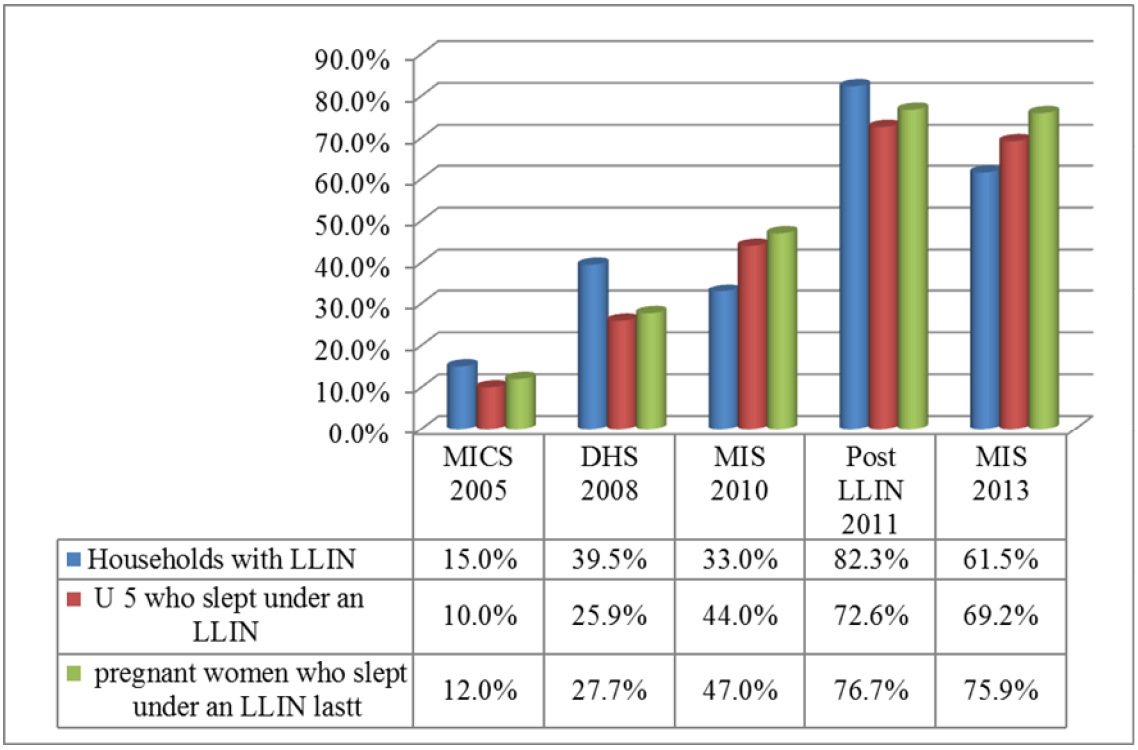
The method used for the campaign was a combination of static point, temporary fixed point, mobile and house-to-house

The first ever successful integrated campaign targeting children under five years was conducted in November 2006. This campaign involved the following interventions: Measles, Vitamin A, Mebendazole and LLINs. The following results were achieved: Measles 100.4%, Vitamin A 100.5%, Mebendazole 98.7% and LLINs 98.8% as illustrated in figure 21 above.
In 2008, based on the experience and successes achieved during the 2006 integrated campaign, the MOHS adopted a bi-annual strategy of integrated maternal and child health week in May and November each year to deliver cost effective interventions including mass IEC/BCC information.

Sierra Leone adopted the universal coverage of LLINs distribution in 2009 and embarked on a nationwide LLINs door to door mass distribution and hang up campaigns in 2010. The mass campaign as a catch-up strategy was aimed at making up for the low LLINs access in the household to reach universal coverage i.e. one LLIN to two people. A national coverage of 97.8% (MCHW November 2010 administrative data) was achieved.

The Sierra Leone MIS in 2010 revealed that an average of 33% household owned at least one mosquito nets (both treated and untreated) as compared to 15% of house hold owning at least one net in 2005 (MICS 2005). 39.5% owned at least one treated net in 2008 (SLDHS, 2008) compared to only 15% in 2005. 72.6% of children under five years and 76.7% of pregnant women in 2011 slept under ITNs (Post campaign ownership and utilisation survey 2011) as compared to 44% and 47% respectively in 2010 (MIS 2010). Only 62% of house-holds were found to own ITN/LLINs in the MIS 2013 survey. Children under the age of five years and pregnant women who slept under an ITN/LLIN the night before the survey were 69.2% and 76% respectively. Figure 22 below illustrate a summary of performance trend analysis from various surveys 2005 ï 2013.

Figure 22: Ownership and trend of ITN/LLIN use



	MICS 2005	DHS 2008	MIS 2010	Post LLIN 2011	MIS 2013
Households with LLIN	15.0%	39.5%	33.0%	82.3%	61.5%
U 5 who slept under an LLIN	10.0%	25.9%	44.0%	72.6%	69.2%
pregnant women who slept under an LLIN lastt	12.0%	27.7%	47.0%	76.7%	75.9%

Larval Sources Management

The IVM policy guideline recommends the use of larval control methods based on evidence and knowledge of the local vector population distribution and dynamics; its applicability is tied with appropriate and feasible condition to stand as a supplement to the adult control interventions such as LLINs and IRS; the environmental management (monitoring of breeding sites, elimination and modification) is of high priority in choosing larval control methods. However, due to funding constraints with the pilot of the IRS in Sierra Leone, larval control have not be fully investigated for operations since extra financial, technical and human resources is needed to embark on this intervention.

Other methods

Environmental Cleaning

The environmental cleaning of the households and surrounding has become a priority strategy to all local council authorities which has stimulated the formation and enforcement of a mandatory Last Saturday Cleaning of every community monthly, whilst routine household cleaning to dispose of domestic waste is encourage on a daily basis.

Personal Protection

The entire country population is encourage at all times to use protective clothing, insect repellent, screening of eaves, windows and doors of dwelling places to reduce the chance of transmission of the malaria disease by the vector(female anopheles mosquito). Ministry of Health and Sanitation focuses mainly on Health Education methods as a strategy of getting community awareness and behaviour change in reducing risk of malaria transmission.

4.3.7 SWOT Analysis

Strengths

- Availability, participation and commitment of DHMT and NMCP staff in malaria vector control
- Establishment of eight functional sentinel sites for malaria vector control activities in the four pilot districts
- Result of a six months consistent bioassay test for the effectiveness of Lambda were conducted at the sites
- Improvement in data quality(RDT/morbidity for malaria) reported at the eight sentinel sites
- Knowledge on the identification of species at larvae, pupae and adult stage of the mosquitoes were learnt, and major malaria vector is anopheles gambiae sl., whilst minority Culecines species. (NMCP- Review Evaluation of Phase 1st IRS, 2011)
- Use of insecticides from different classes were tested and concluded showing 100% mortality within 24hrs and the efficacy of the chosen insecticide (Lambda-cyhalothrin) (NMCP, Susceptibility test of insecticides, 2010).
- Conducted efficacy test for LLINs in use at Koribondo and Badge PHUs the pilot districts, in October 2010 and May 2012(NMCP, LLIN Insecticide efficacy evaluation, 2012)
- Orientation of three national IRS focal, Sixteen(16) DHMT members were trained as district IRS focal persons and One hundred and thirty (130) spray operators were trained and refresher training in phase 2
- Two (2) National staff trained in Vector Borne Disease and malaria crisis management in Ghana, Accra.
- Two (2) Environmental Health staff trained in integrated vector management in Ghana, Accra.
- Two vector control technicians trained in maintenance of spray pumps.
- Use of PPE by the spray operators was enforced and the triple rinse method adhered to for all spraying operation to avoid any possibility of environmental pollution.
- Four district stores were secured for storage of the insecticide and equipment without damage or theft and ensuring protection of the environment and human population

- Three(3) project vehicles were provided by WHO through MDTF, and ten(10) project motor bikes provided by WHO
- Provision PPE, food accessories, milk & foods for 130 spray operators
- FREE LLINs available for target groups (Pregnant Women & Children under five years)
- Reporting tools and training/reference materials available and LLIN Policy Guidelines available (includes universal access)
- The NMCP and CRS IEC component supported by Global Fund creates awareness on the use of LLIN and to avoid the misuse of nets

Weakness

- Inadequate funding and lack of tools like the ELISA test kits for malaria sporozoites count created barriers in finalising the IRS annual reports and for continuous vector susceptibility tests.
- Poor road networks limits the establishment of the sentinel sites to some potential PHUôs
- Financial inadequacies for the Indoor Residual Spraying (IRS) program in the four districts served as limiting factors in getting adequate coverage on vector density Entomological Inoculation Rate (EIR)
- Inadequate funds for staff motivation and recruitment of local guides for vector studies
- Use of Larvicides as strategy have not been adequately explored and justified for operation based on the criterion necessary for it adoption.
- Lack of GPS tools and training on the GIS software/ Health mapper to focus vector surveillance
- Inadequate provision of spares parts/ lack of local shops in marketing spare parts for the pumps/sprayers
- Lack of long term training on malaria entomology in overseas
- Lack of specific workshop for the maintenance of spray pumps
- inadequate vehicle support for the movement of spray operators and supervision
- Inconsistency of LLINs supplies to district and PHUs and storage problems at PHU
- Inadequate transport facilities at all levels affected distribution of logistics although funds were provided for distribution of LLINs
- Lack of policy decision and provision of LLINs for boarding schools, Hospitals, Hotels; and policy context of addressing misuse of LLINs
- Lack of funds in pursuing vector control research plan Lack of ties between the regional and international collaboration Institutes in vector control research
- Inadequate resources to enable communities continue awareness raising on the use of vector control in malaria prevention
- DHMT has an Annual Work Plan, but does not include malaria Control & Prevention interventions as objected by the council due to support receive from Global Fund
- Huge number of the PHU staff interviewed have not received malaria training (2 out of 6 at Masongbo / 1 out 7at Binkolo)
- There is no evidence of trend monitoring of malaria displayed on tables, charts at the hospitals

- Frequency of spraying (IRS) was inadequate, as it was done once in a year whilst the standard calls for two rounds a year
- Inadequate number of LLINs for the hospital beds

Opportunities

- Provision of Technical Assistance by WHO to strengthen vector control interventions during the last pilot
- Potential provision of Technical Assistance by WHO for malaria entomology in 2014
- Equipment & training guidelines available IRS program serve as a starting point for further studies
- PHU staff at sentinel sites trained for use RDT in the screening of suspect malaria cases, diagnosis and treatment for uncomplicated malaria will improve quality of reports.
- Mosquito breeding cages at the sentinel sites will be used in further studies
- Knowledge built in artificial breeding of mosquitoes and managing of insectary as foundation
- Potential use of Deltamethrin, Malathion, and Bendiocard can be prepared for in case of any noticeable resistance of the vector population to the current insecticides
- Independent investigation on sample LLINs to recognised laboratory (Kutsaga Research Laboratories) in Harare for chemical residual analysis to evaluate the target dose of the insecticide on the netting
- Potential of Global Fund support for vector bionomics and Insecticide Resistance studies will be very beneficial for the country.
- Community trust in the effectiveness of the insecticide and involvement of the stakeholders in IRS will influence the provision of better store facilities
- Global Fund and RBM support for the next LLINs Universal campaign 2014 and routine LLINs
- Integration of ITN supply with other regular activities (e.g. ANC package & EPI etc.) at PHUs
- Adhoc community sensitization meeting attended by the PHU staff can be used to discuss vector control
- The establishment of bye laws and the declaration made by the health minister may reduce the misuse of nets

Threats

- Competing interest for funds in implementing interventions for diseases like TB, HIV/AIDS and others.
- Inadequate salary remuneration for staff will de-motivate and reduce potential successes
- Unplanned human activities that contributes to the provision of breeding sites grows on a daily basis
- Financial constraints in scaling up IRS and Seasonal and environmental conditions
- Inadequate interest of stakeholder in the promotion of vector susceptibility studies.
- Potential insecticide resistance in the target communities or others communities un-noticed

- Lack of emergency preparedness plan for insecticide resistance for malaria prevention
- Exclusion of specific entomological training from IRS and NMCP budget
- Inadequate participation of NGO partners in supporting training programs and entomology activities
- Persistent use of Pyrethoid in malaria prevention and agricultural activities
- Misuse of ITNs for other purposes (sapo, fishing, ñprotectò pigs/chickens)
- People not using nets due to cultural and social reasons that needs to be thoroughly investigated
- Disposal of old/expired LLINs in communities (replaced LLINs)
- Inadequate participation of the Private partners in vector control
- Inadequate spacing in DHMT building for the establishment of permanent district vector control structures

4.3.8 Successes, best practices and facilitating factors

Best Practices

Indoor Residual Spraying, Planning, Monitoring, Reporting Framework of Pilot:

- **Country evaluation;** Environmental Mitigation & monitoring Plan; Insecticide Susceptibility evaluation ; IRS Resource mobilization(logistics & financial planning) ; Launch of 1st phase IRS & implementation; Post spray evaluation; Planning for 2nd phase IRS & implementation; Post spraying debriefing; M & E (data collection & analysis on malaria epidemiology and entomology); Final Technical Report (Awaiting) were all best practices as this was a pilot project.
- **The insecticide selection criteria** was WHOPES approval & based on safety of the pesticide; these pesticides were Registered for use in Country; Acceptable by NMCP; Should have residual effect of more than 4 months; Susceptibility of pesticide to malaria vectors in the region; Demonstrate low toxicity to human & external environment; Low risk to the environment, livestock's & agriculture in terms of toxicity; Competitive cost of insecticide; Country capacity to prevent pilferage.
- **Selection of IRS Pilot Area** were also based on criterion: Analysis of the morbidity & incidence rate; Capacity of the districts to manage IRS; Existing infrastructure; Human resources Capacity; Stakeholder participation; Economic Activity; Available Sentinel Sites for monitoring; Logistics/ resources available for implementation; Environmental Compliance issues & capacity to manage the situation
- **Before Spraying**: District & Community Stakeholder held meetings; Radio discussions & Jingles also used; Thorough community mapping & surveillance; Training of district IRS Spray operators were done on spraying and data collection appropriately; Safety logistics were also distributed to district and chiefdom level; Mobilization of Partners & communities (resources- transport, accommodation, food); Security of the operation is governed by community members to avoid pilferage and losses of household items.
- **Partner Participation**: Provision of Vehicle by MSF Belgium to Bo DHMT, provision of vehicle by IRC to Kono DHMT, provision of fuel by WVI to Kono DHMT, these supports received acted as a good starting point.

- **Stakeholder Participation**: National IRS task force; District IRS task force; Chiefdom IRS Taskforce were very willing to support the spray operators with domestic resources

Other best practices include;

- **Contribution Of Health Partners**: (Plan SL, UMC, CRS, UN Agencies, & CSO) to the implementation of the policy guidelines have been very influential to the achievement made in the universal campaign and routine distribution of LLINs, though adequate participation is still necessary to ensure appropriate utilization of the LLINs and avoid the misuse of the LLINs.
- **Proactive Initiative**: demonstrated by the Honourable Minister of Health declared the illegal sales of LLINs supplied or distributed through the health facility to be classed as crime to the state and punishable by laws of Sierra Leone.

4.3.9 Issues and challenges

Challenges

- Participation of the Private organization in IRS is inadequate (especially the mining companies)
- WHO Funding for the IRS pilot have not been very smooth as expected
- Financial support from the DHMT through the Local Councils were lacking
- Financial support for research on vector density, Entomological Inoculation rate, and insecticide resistance studies and investigation of inadequate use of the LLINs was lacking
- The major weakness noticed in the policy guideline is the inability of stating how to handle misuse of the LLINs after distribution and disposal of worn out LLINs at district or community level in the country
- Existing misuse of LLINs due to personal, cultural and socioeconomic factors
- Stock out of LLINs for routine distribution due to operational and financial constraints
- High competition for the limited available resources by the other diseases like HIV/AIDS, Malnutrition, TB, and maternal child health issues makes the implementation of the vector control policy guidelines a challenge especially in the Indoor residual Spraying program.
- Inadequate organizational structure for the malaria vector research and surveillance component, and to link with regional and international institutions

4.3.10 Conclusion and Recommendations

The review team noted some accomplishments made by the National Malaria Control, the District health Management Teams and Roll back Malaria partners in the implementation of the 2010 Universal coverage campaign for LLINs, routine delivery of LLINs to Pregnant women and children under five years, and the Indoor residual Spraying pilot in the four districts.

The trend analysis for the two interventions showed a good starting point, although the district had just one spraying rounds per year instead of two rounds per year due to financial constraint, the IRS annual percentage coverage of the sprayed communities in the four pilot

districts had steady progress in Bombali, Bo and Kono districts, whilst Western Area rural maintained the same coverage for the two years period. The country population received about 3.2 million LLINs during the last campaign in 2010 and the routine delivery to pregnant women and children continues with occasional stock out at PHU levels due to administrative or transport constraints.

Furthermore, the review noted key operational and technical issues that need to be address timely in scaling-up malaria vector control interventions such as: lack of funds in sustaining IRS or scale-up; occasional stock-out of routine LLINs distribution; inadequate funds for insecticide resistance monitoring; limited entomological monitoring & surveillance; non-functional national TWG and poor coordination of partners; limitation observed in LLINs policy guideline and the NMCP strategic plan.

However, the review team proposed the following recommendations to sustain the gains of the past years, and how to forge ahead; national and district stakeholders to engage in resource mobilization (financial/technical) for entomological services delivery and scaling IRS; strengthen participation and commitment of NGOs, FBOs, and private organizations in malaria vector control; investigate reasons for inadequate use of the LLINs and enforce the implementation of bye laws to avoid misuse of nets; and to ensure routine monitoring of insecticide resistance in the whole country and supported with an emergency preparedness plan.

Table 16: Malaria Vector Performance

Area	Scores				Comments
	3: Highly Adequate	2: Adequate	1: Present but inadequate	0: Inadequate	
Primary and secondary malaria vector bionomics			X		
Indoor Residual Spraying			X		
Long lasting insecticidal nets		X			
Integrated vector management				X	
Delivery capacity structures and system			X		
Policies and guidelines			X		
Organization			X		
Entomological programme support				X	
Malaria vector control research				X	
Advocacy, information, education, communication and community involvement			X		

Source:

Priorities/ Action Points

- Financial support for research on Vector mapping & Density, Entomological Inoculation Rate, Biting Rates, Resting habits, and insecticide resistance studies and investigation of reasons for inadequate use of the LLINs.
- Participation of NGOs, FBOs, and Private organization in malaria vector control
- Sustained funding that will ensure standard spraying of all target structure yearly(twice a year) when scaling -up
- DHMTs should ensure budgeting for vector control in their comprehensive district health plans through the local councils.
- Linking of the malaria vector research with regional and international institutions to improve quality and assist in resource mobilization.
- Revision of the LLINs policy document to include measures that will adequately address misuse at every level before and after distribution.
- Revision of the strategic plan to adequately include the use of IRS scale-up in the country through government and health sector partner budgets.
- Provision of malaria entomology training opportunities for staff and promote good salary or incentive scheme to motivate staff in producing quality results.
- Timely risk management to reduce potential stock out of LLINs for routine distribution
- Development of yearly LLINs distribution plan/road map to demonstrate potential partners in routine distribution.
- Provision of fund to operationalize the Integrated Vector Management Policy 2010 to improve malaria vector control measures.

4.4 Malaria Diagnosis and Case Management

Malaria is endemic in Sierra Leone with stable and perennial transmission in all parts of the country. *Plasmodium falciparum* is the dominant parasite mainly responsible for all severe cases and over 95% of uncomplicated cases. However, there are also cases of clinical malaria caused by *Plasmodium malariae and ovale* or a mixture of these and *falciparum* (British Medical Research Council, 1998).

The predominant vector is *Anopheles gambiae s.l.* but other species found in Sierra Leone are *Anopheles funestus* and *Anopheles melas.* The *Anopheles gambiae s.l* is the predominant species during the rainy season. The peak biting period is between 10p.m ï 2a.m. The most recent entomological studies were carried out prior to the civil war between 1990-1994. Those studies found Annual Entomological Inoculation Rates (EIR) ranging from 6.1 to 884.2.

4.4.1 Introduction

Malaria is endemic in Sierra Leone with stable and perennial transmission in all parts of the country. *Plasmodium falciparum* is the dominant parasite mainly responsible for all severe cases and over 95% of uncomplicated cases. However, there are also cases of clinical malaria caused by *P. malariae and P. ovale* or a mixture of these and *P. falciparum* (British Medical Research Council, 1998).

The predominant vector is *Anopheles gambiae s.l.* but other species found in Sierra Leone are *A. funestus* and *A. melas.* The *A. gambiae s.l* is the predominant species during the rainy season. The peak biting period is between 10:00 PM. and 2:00 AM. The most recent entomological studies were carried out prior to the civil war between 1990 and 1994. Those studies found Annual Entomological Inoculation Rates (EIR) ranging from 6.1 to 884.2.

Malaria is a major public health problem in Sierra Leone; it is also the leading cause of mortality, morbidity, and disability. Malaria risk and burden are evenly distributed across the country. Children under five, pregnant women, and rural residents constitute the most vulnerable groups in the country. Malaria is stable and transmission is perennial. The tropical climate with optimal rainfall patterns, temperature, and humidity support a continuous transmission all year round.

The entire populace is at risk of developing the Malaria, which accounts for over 40% of outpatient morbidity. Malaria is a major threat to the socio-economic development of the country with an estimated 7 ï 12 days lost per episode of malaria.

4.4.2 Policy and guidance

The aim of case management is to ensure early diagnosis and prompt treatment through improved access to effective antimalarial drugs. The quality of care in public and private health facilities will be improved.

Prompt and effective treatment of malaria as well as appropriate management of clinical complications is a critical element of malaria control. It is vital that sufferers, especially children aged less than 5 years, start treatment within 24 hours of the onset of symptoms to prevent progression, often rapidly, to severe malaria and death. In order to effect this,

diagnosis should be prompt and accurate so that management is carried out within the shortest possible time.

Previously malaria case management in Sierra Leone was based on presumptive treatment at all levels of health care. However, with the introduction and wide distribution of rapid diagnostic tests (RDTs), the NMCP has improved malaria case management nationwide.

Presently, the malaria case management protocol stipulated in the Malaria Strategic Plan involves confirmatory diagnosis using Rapid Diagnostic Test (RDT) and/or microscopy and the use of Artemisinin-based combination therapy (ACT) for treatment. The focus of effective malaria case management is at both public and private sector levels, including management malaria cases at the community level through community-based providers (CBPs), health facility and hospital levels. Effective case management involves the ability of health workers to recognize symptoms early, use diagnostic tools appropriately, and treat with ACTs. This also ensures that people will have access to effective treatment within 24 hours of onset of fever. Additionally, parasitological diagnosis (by microscopy or RDT), which was not mandatory in the past is now available within a short time (2 hours) of the patient presenting.

Although both microscopy and RDT techniques can provide a confirmed diagnosis, microscopy remains the gold standard for malaria diagnosis, as it can provide information of malaria parasite type, stage, and density. RDTs on the other hand, can only provide information on the presence of parasites currently or in the recent past by measuring antibodies to specific antigens from the parasites. In addition RDTs are easy to use and are recommended for places were microscopy is not feasible.

With the present widespread availability of RDTs, confirmed malaria cases (clinical and parasitological) are given prompt and appropriate treatment. Treatment solely on the basis of clinical suspicion is not recommended and should only be considered when a parasitological diagnosis is not accessible or possible.

Over the years, the NMCP has transitioned from using various mono-therapies (i.e. Chloroquine) and is now at the point where the use of ACTs has been established nationally. The recommended ACT of choice for the treatment of all cases of uncomplicated malaria is Artesunate plus Amodiaquine (AS+AQ) with the exception of pregnant women in the first trimester and children below 5kg body weight. The route of administration is oral and should be given daily for a total of three days. The recommended dose is 4 mg/kg body weight /day of Artesunate and 10mg/kg body weight/day of Amodiaquine. The combination of AS+AQ is now provided as a fixed-dose formulation for all age groups.

In situations where the use of AS+AQ combination is not well tolerated, the alternative recommended medicine for the treatment of uncomplicated malaria is Artemether-Lumefantrine, except for pregnant women and infants less than 5kg. Infants weighing less than 5kg should be given oral quinine at a dose of 10mg/kg 8 hourly for 5 days.

ACTs are available in the public health facilities, few private health facilities and faith based institutions at no cost for all categories of people. This has led to better patient outcomes as treatment is definitive, prompt and quality assured drugs are used. National data has increased validity as data is generated from both private and public sector.

In the past the National Malaria Control Programme primarily dealt with the public sector health facilities, but now the NMCP has expanded its activities to involve several national, international and non-governmental partners including the private sector.

The NMCP, in collaboration with partners including the private sector, have developed policy and strategic documents which include treatment guidelines, training manuals, job aides, and treatment algorithms for malaria treatment at all levels. These materials are available in all public health facilities and few private/faith based institutions. This has ensured that treatment of uncomplicated malaria is standardized at all levels of the health care delivery system in the country.

By engaging the private sector in malaria control, NMCP has also ensured that national data generated for malaria morbidity is valid as data from this sector, which provides care for 10% of the out/patient care, is included in the national database.

Surveillance

Drug efficacy studies

The emergence and spread of multi-drug resistant *P. falciparum* has been one of the most significant changes in the dynamics and epidemiology of malaria in Sierra Leone. Drug efficacy studies conducted in 2003 on Chloroquine (CQ), Sulphadoxine-Pyrimethamine (SP), and Amodiaquine (AQ) as mono-therapeutic agents showed P. falciparum resistance to these drugs. The day-28 treatment failures rates for CQ and SP were 39 ï 78% and 17 ï 46%, respectively. This has necessitated the replacement of CQ and SP as the first and second line treatments, respectively, for uncomplicated malaria. Parasite resistance to AQ was lower, with the exception an isolated report of 29.8% failure rate in one district (Kailahun), which has raised concern.

A subsequent therapeutic efficacy study of Artesunate-Amodiaquine (AS-AQ) combined treatment involving children aged 6-59 months in the same district showed a PCR-adjusted day-28 cure rate of 84.5% (Grandesso et al., 2006). This calls for close monitoring of the therapeutic efficacy of AS-AQ combined treatment which is currently the recommended treatment for uncomplicated malaria in Sierra Leone.

Table 17: Drug efficacy test validated results (July 2003)

Anti-malarial Drug	Clinical Cure Rate By Day 14 (%)	Failure Rate By Day 14 (%)	Failure Rate By Day 28 (%)	PCR Failure Rate By Day 14
CQ	20 ï 60%	40 ï 80%	67%	39.5 - 78.8
SP	72 ï 98%	2 ï 28%	50%*	17.6 - 46.1
AQ	**92 – 100%**	**0 – 8%**	**31%**	**Not available**

Source: F. Checchi et al. Evidence basis for antimalarial policy change in Sierra Leone, 2003.

Following a consensus meeting in March 2004 on the validated drug efficacy results, in which the merits and demerits of ACT were extensively discussed, a decision was taken to adopt the use of ACTs and to review the current antimalarial treatment policy using Artesunate and Amodiaquine combination as drug of choice for treating uncomplicated malaria.

Consequently, the Ministry of Health and Sanitation has put a ban on the use of Chloroquine and Artesunate monotherapy. Additionally, there is a strong political commitment which is indicated by the provision of tax waiver on all antimalarial products and the policy of free malaria treatment for all.

Monitoring the therapeutic efficacy of antimalarials in Sierra Leone has taken place and will continue. The findings of which will be used to revise the national treatment guidelines as necessary. In addition, standard treatment guidelines and tools will be distributed to various institutions to ensure the quality of malaria diagnosis; support will be provided for clinical trials and studies and WHO standard protocols will be used to monitor the therapeutic efficacy of antimalarials.

In 2004, Sierra Leone changed the first line treatment for uncomplicated malaria from Chloroquine to Artesunate +Amodiaquine. Artemether-Lumefantrine is the alternative first line treatment in case of contraindications or side effects to the combination of Artesunate + Amodiaquine.

After six years of implementation of Artesunate + Amodiaquine at health facility level, the Ministry of Health and Sanitation (MOHS) is in the process of scaling up the use of Artemisinin based Combination Therapy (ACT) the community level to treat uncomplicated malaria. Before the planned scaled up implementation of Community Case Management of Malaria, the MOHS would like to establish the current status of the efficacy and safety of Artesunate + Amodiaquine as the first line treatment and Artemether-Lumefantrine as the alternative first line treatment and establish baseline data for these first line drugs.

Taking cognizance of the afore stated, a study was conducted in 2012 by NMCP in collaboration with WHO to assess the therapeutic efficacy and safety of fixed-dose Artesunate-Amodiaquine (AS-AQ) and Artemether-Lumefantrine (AL) in four sentinel sites, in the treatment of uncomplicated *P. falciparum* malaria among children under five years who

present with confirmed uncomplicated malaria.

The study result revealed that a 100% (95% CI) Adequate Clinical and Parasitological Response was obtained for both ACTs in all four study sites when corrected for PCR. Results from this study indicate that both Artesunate-Amodiaquine and Artemether-Lumefantrine combinations remain highly efficacious in Sierra Leone with presently no observed emergence of resistant strains to both drugs.

Table 18: Therapeutic efficacy of Artesunate+Amodiaquine in two sites and Artemether-Lumefantrine in two sites - PCR corrected

Treatment outcome	Artesunate + Amodiaquine		Artemether+Lumefantrine	
	Kenema (n=101)	Rokupa (n=8)	BO (n=106)	Makeni (n=105)
% Early Treatment failure (95% CI)	0.0 (0.0-3.7)	0.0 (0.0-36.9)	0.0 (0.0-3.6)	0.0 (0.0-3.5)
% Late Clinical Failure(95% CI)	0.0 (0.0-3.7)	0.0 (0.0-36.9)	0.0 (0.0-3.6)	0.0 (0.0-3.5)
% Late Parasitological Failure (95% CI)	0.0 (0.0-3.7)	0.0 (0.0-36.9)	0.0 (0.0-3.6)	0.0 (0.0-3.5)
% Adequate Clinical & Parasitological response(95% CI)	100 (96.3-100)	100 (63.1-100)	100 (96.4-100)	100 (96.5-100)
Kaplan-Meier Cumulative Treatment Failure *Rate*	0.0	0.0	0.0	0.0

Table 19: Therapeutic efficacy of Artesunate+Amodiaquine in two sites and Artemether-Lumefantrine in two sites - PCR uncorrected

Treatment outcome	Artesunate + Amodiaquine		Artemether-Lumefantrine	
	Kenema (n=101)	Rokupa (n=8)	BO (n=106)	Makeni (n=105)
% Early Treatment failure (95% CI)	0.0 (0.0-3.6)	0.0 (0.0-36.9)	0.0 (0.0-3.4)	0.0 (0.0-3.5)
% Late Clinical Failure (95% CI)	1.0 (0.0-5.4)	0.0 (0.0-36.9)	0.9 (0.0-5.1)	0.0 (0.0-3.5)
% Late Parasitological Failure (95% CI)	3.0 (0.6-8.4)	0.0 (0.0-36.9)	4.7 (1.5-10.7)	0.0 (0.0-3.5)
% Adequate Clinical & Parasitological response (95% CI)	96.0 (90.2-98.9)	100 (63.1-100)	94.3 (88.1-97.9)	100 (96.5-100)
Kaplan-Meier Cumulative Treatment Failure *Rate*	0.0	0.0	5.6 (2.6-12.1)	0.0

Source: NMCP Drug Efficacy Study, 2012 Report

Pharmacovigilance

The Drug Information and Pharmacovigilance Department has been set up as a special unit in the Pharmacy Board of Sierra Leone as the National Centre for Drug Monitoring to coordinate all pharmacovigilance activities within the country. The integration of Doctors,

Nurses, and Pharmacists in reporting adverse drug reactions (ADRs) has led to the increased nationwide pharmacovigilance in both public and private sectors, which has increased awareness and sensitization on its importance.

The improvement in drug safety monitoring has led to the Drug Information and Pharmacovigilance Department becoming a member of the WHO Drug Safety Monitoring, Upsala Monitoring Centre. The vigiflow reporting system is used to promptly report cases of ARD to the Upsala Centre in Sweden for further assessment. The capacity of staff on adverse drug reaction monitoring has been strengthened and the malaria programme with the pharmacy board has been conducting routine monitoring visits to health facilities and from the feedback from the field, health workers are not adequately aware of the importance of recording and reporting ARDs. Though reporting forms have been disseminated widely to health facilities, both hospitals and periphery health units, most health workers are not reporting on ARDs. However, the shortage of Reference Standards and human resource trained in the use of the tool leads to invalid results in the laboratory.

In order to improve the pharmacovigilance, the following should be considered: capacity building of staff (laboratory technicians and Pharmacy technicians), provision of an enabling environment (water supply, electricity supply, etc.), strengthening the quality control of diagnostics (microscopy and RDTs), and supportive supervision and regular monitoring.

National Quality Control Laboratory

A National Quality Control Laboratory has been established at the Pharmacy Board of Sierra Leone. The availability of Tru-Scan equipment facilitates the detection of counterfeit and substandard drugs which include antimalarial commodities and diagnostics (ACTs, RDTs, and reagents). The unit ensures that drugs entering the country go through the regulatory process of the pharmacy board.

Quality Assurance and Quality control (QA/QC)

A system has been set up that enables laboratories achieve and maintain high levels of accuracy and proficiency. The quality of antimalarial commodities (RDTs and ACTs) is ensured before distribution to health facilities, including the community level. Standard Operating Procedures (SOPs) and guidelines have been developed to facilitate the process.

All facilities performing the biological diagnosis of malaria and having to manage the laboratory equipment should have the relevant SOPs. They allow the standardisation of techniques and facilitate the procurement and management of the laboratory. Furthermore, it will allow supervision to be effective by correcting the mistakes in relation to the described technique and allow training in service.

There is a Road map for quality assurance and control for malaria for the period covering 2013 ï 2018. The Management Plan which is a guiding document describes the activities the NMCP intends to implement over a five year period: 2013 and 2018. It will include a provisional budget. This is a strategic document that can be used to advocate and mobilize

funds in favour of the planned activities. Moreover, it will identify potential collaborations with other partner organizations and contribute to the effort to strengthen the laboratory services.

The key personnel that will be in charge of making the QA/QC operational needs to be defined (Terms of References), budgeted and trained to fulfil their respective mandate. Depending on the resources available new personnel may be recruited or MoHS personnel may be appointed as focal points.

In order to orient the personnel in charge of receiving and storing the kits, reagents and equipment, guidelines should be developed and distributed for implementation. These will include the visual inspection on arrival, post-market quality surveys, inventory, transport and storage conditions.

Training tools for the Training of Trainers (ToT) and test performers should be developed and these will include the diagnosis component but also the quality assurance/control, the use of equipment, the safety and security practices and safe disposal of waste material. The existing WHO Training of Trainers, Participant and Microscopy Quality Assurance manuals can be used to guide the process and be adapted to Sierra Leoneôs epidemiological situation. Furthermore, an end of training assessment should be planned and carried out.

An annual training plan which will allow identifying the personnel needing refresher training and their geographical location for subsequent year and also permitting the allocation of resources and prioritization of areas to be covered. In addition, an annual supervision plan will be develop allowing the organizing the onsite visits throughout the coming year. It will permit the allocation of resources and inform the supervised facilities on the intended visits dates.

Monitoring RDT stability in the field will be ensured. RDTs are sensible to high temperatures and humidity, hence the need to monitor their efficacy at regular intervals whilst deployed in the field. Different methods may be implemented. RDTs from the central level (kept in ideal storage conditions) may be brought to facility level and by using the same blood sample compare the result between the locally stored RDT and the centrally stored one. Develop the relevant tracking tools to document the activity.

Setting up a National Reference Laboratory for Malaria needs to have adequate infrastructure and highly competent Microscopists for the diagnosis of malaria. The mandate of the laboratory will include develop the training material, guidelines and recording tools, setting the national standards in terms of diagnostic tools and test performers competency and be involved in the national external quality assessment for malaria microscopy. The National Reference Laboratory for Malaria will subscribe to an international External Quality assessment. However, the quality testing system is in its infancy with more material, human resources and networking needed to improve its performance.

4.4.3 Organization of Case Management Services

The Malaria Control Programme is a unit in the Directorate of Disease Prevention and Control of the Ministry of Health and Sanitation (MoHS) and is a major component of the revised National Health Plan who is charged with the responsibility to plan, facilitate the implementation, coordination, supervision, and monitoring of malaria control activities in an integrated disease control approach.

The organization of the case management services has four aspects: Human Resources, Monitoring of Quality of Care, Capacity Building for Community Case Management of Malaria (CCMm) and partnership for CCMm.

4.4.4 Human Resources, Training and Capacity Development

The NMCP is headed by a Manager supported by a Programme Administrator, Technical Officers, Finance Officer, Secretaries and Support Staff. One of the Technical Officers is the Malaria Case Management Focal Point who is also responsible for Community Case Management of Malaria. The Malaria Case Management Focal Point is charged with the responsibility to coordinate capacity building activities on malaria case management in public and private health facilities including training of community. Figure below provide details.

Training is one of the components to achieve effective case management of malaria. The NMCP has developed at the national level, a core group of trainers on malaria case management. This core group comprises members from the public and private sector and in different areas of specialization. They are responsible to facilitate NMCP organized trainings for malaria case management and advocacy for hospital staff nationwide.
The goal of the training program is to equip the Primary Health Care workers with the basic skills that would enable them recognise and manage cases of suspected malaria. Several trainings have been conducted targeting peripheral health unit workers, laboratory technicians, and hospital staff. Below is a list of trainings done between 2007 and 2013.

- In 2007 and 2008, 125 laboratory technicians were trained in the public sector.
- In 2009, 50 hospital staff were trained (Western Area).
- In 2009, 100 hospital staff were trained on malaria case management including few private health facilities (district level).
- In 2012, 65 DHMT members were trained as Trainers (ToT) on Malaria Case Management and use of RDT.
- In 2012, 1022 PHU workers were trained on malaria case management.
- In 2012, 25 laboratory technicians trained on malaria/TB and HIV (under GF Health System Strengthening Support, 2012).
- In 2013, 1236 PHU workers trained on malaria case management and scale up use of Rapid Diagnostic Tests (RDTs).
- In 2003, xxx hospital staff from the public and private sectors were trained on malaria diagnosis and case management of malaria.
- In 2013**,** 6,515 CHWs were trained in malaria case management and RDT use
- 5200 CHWs trained on ICCM- 2006-2013.

Cognizant of the fact that Integrated Management of Childhood and Neonatal Illness (IMNCI) plays an important role in malaria training, all the trainings were done in accordance with the IMNCI protocol. Main areas of training include, but are not limited to, the following: Epidemiology of malaria, signs of symptoms of uncomplicated malaria, vulnerable groups, how to perform an RDT to confirm suspected cases of malaria using RDTs and providing appropriate treatment to positive cases, RDT waste disposal, identification of danger signs of malaria, referral of severe cases and reporting tools.

All trainings include the nationally developed training tools, include the training manual for the management of malaria at peripheral health facilities, training manual for malaria case management, national laboratory manual for malaria diagnosis, treatment algorithms, and job aides.

Ad hoc trainings have been provided for the public and private health facility staff during routine monitoring and supervision.

Refresher trainings have also been conducted for the health workers but not all that received basic training have been refreshed.

It is evident that training for health workers has been irregular, inadequate and insufficient. For prompt, effective and appropriate management of malaria, health workers should be provided with new information regularly to improve their knowledge and skills to perform their tasks appropriately.

Monitoring quality of care

Continuum of care is an integral part in providing quality care to patients. Monitoring the quality of care both in inpatient and outpatient facilities results in improved treatment outcomes and standardized care. Assessing quality of care has been going on but not regular and is been done only in few public health facilities. Training of staff to carry out the activity remains a major bottleneck as health personnel are rotated periodically in health facilities throughout the country.

Community Case Management of Malaria (CCMm) Capacity Building

Universal access to prompt and effective treatment of malaria by 2015 is one of the Roll Back Malaria (RBM) key targets. Community Case Management of Malaria (CCMm) has been made a priority programme in the health sector. To increase access to malaria treatment at all levels of the health care delivery, especially at the community level, the country has adopted the Home Management of Malaria (HMM) strategy, now Community Case Management of Malaria using ACTs since 2008 with support of Global Fund Round 7. This activity is implemented countrywide. To reduce morbidity and mortality due to malaria, diagnosis and treatment of malaria have been included in the Basic Package of Essential Health Services (BPEHS).

In 2008, HMM was only carried out in 5 districts namely: Bombali, Pujehun, Bo, Port Loko, and Kenema. Each district trained 20 Community Oriented Resource Persons (CORPs) to

carry out health promotion activities and also treatment of malaria cases based on signs and symptoms. In 2012 their responsibility was increased, not only treating malaria based on clinical findings but are trained on testing using Rapid Diagnostic Tests (RDTs) prior to treatment. A total of 6,515 CHWs have been trained on malaria case management and use of RDTs.

There are about 5,200 CHWs that are implementing Integrated Community Case Management of Malaria (ICCM) in six districts (Kono, Kenema, Kambia, Tonkolili, Pujehun and Kailahun) and they were supported by UNICEF. Not all of the 5,200 CHWs that are implementing ICCM, are trained to use RDTs. This is a current challenge in the case management of malaria at the community level, since there are still a large proportion of CHWs that are treating malaria, without first testing with a RDT.

A challenge with the management of children with severe malaria identified by CHWs is the time delay between the identification of danger signs in the community and the eventual referral to the health facility. Other challenges include administration of pre-referral treatment such as rectal Artesunate, which may not be available and even in places where available, cultural beliefs prevents CHWs from administering it.

For meaningful community health programme implementation involving CHWs, attention should be paid to the following recommendations: intensify community sensitizations to increase access to services, provide standardized basic and refresher training for CHWs, regular supportive supervision and to improve the linkages between the CHW and PHU to avoid double testing, strengthening supply chain management systems, improve on waste disposal at community level, develop and implement sustainable motivation package.

Partner involvement in CCMm implementation

Implementation of CCMm is done in collaboration with partners. Below is a table that shows the areas of operation of the NGOs.

Table 20: Partners profile for CCMm

No.	Name of Organisation	Districts of Implementation
1.	IRC	Kono, Kenema
2.	CARE	Kambia Koinadugu
3.	Save the Children ï UK	Kailahun, Pujehun
4.	BRAC	Kono, Kenema Bo, Bombali, Tonkolili, Port Loko, Western Area
5.	MSF-Belgium	Bo
6.	MRC	Bo
7.	SLRCS	Bo, Bonthe, Moyamba, Pujehun, Kenema, Kailahun, Bombali, Tonkolili, Koinadugu, Port Loko, Kambia, Western Area.
8.	CRS	Bo, Bonthe, Kenema, Bombali, Tonkolili, Koinadugu, Port Loko, Kambia, Western Area
9.	Plan SL	Kailahun, Bombali, Port Loko
10.	Child Fund	Kailahun, Bombali, Koinadugu,
11.	AFDSL	Port Loko, Western Area
12.	CAWeC	Port Loko, Kambia
13.	FHADA	Port Loko, Kambia,
14.	ABC	Kambia
15.	Concern Worldwide	Tonkolili, Western Area
16.	World Vision	Kono, Bonthe, Bo, Pujehun

Source: NMCP RBM Partnership database

4.4.5 Annual planning

Planning for malaria case management services is integrated into the annual planning at all levels of the health care delivery. In addition, proposals are developed to source additional funding from the Global Fund and other stakeholders to support the implementation of activities to improve access to treatment and to ensure quality care.

4.4.6 Malaria Diagnosis

Microscopy is the main diagnostic method used in Sierra Leone to diagnosis malaria. This is complemented by Rapid diagnostic Test (RDT). Microscopy is used at facilities with functional Laboratory and the availability of a trained Microscopists, usually at community health centres (CHC), hospital and tertiary care facilities. RDTs are used in all health facilities in particular in places where there are no facilities for microscopy (but not limited to lack of laboratory facilities, power source or skilled personnel) and in some outreach clinics.

Treatment provided solely on the basis of clinical diagnosis should only be considered when a parasitological diagnosis is not accessible. The quality of microscopy and RDTs are assured through regular cross-checking of slides and results through regular training and refresher training for all health staff.

4.4.7 Malaria Treatment

Current Status of Implementation

With the use of available guidelines, Standard Operating Procedures (SoPs) and job aids, and increases in budgetary allocation, there is recognized and acceptable diagnosis for treatment. There is also improved data management with availability of registers, and reporting tools, and because of these, there is positive behavioural change to diagnosis.

Under the Global Fund Round 9 grant, microscopes have been allocated to Community Health Centres (CHCs) and RDTs to all the Peripheral Health Units (PHUs) in an effort to strengthen and improve on effective case management.

Notwithstanding, the introduction of testing prior to treatment, limited number of trained and qualified personnel has led to low use of microscope at all level e.g., PHU - CHC etc. and hence personnel are overburdened. Work load increases turnaround time, quality of the data, data not complete, low capacity to analyze the data at all levels are presented due to harmonization of vertical programmes data with national laboratory data as well as damage to equipment.

The NMCP with support from the World Health Organization (WHO) in 2012 carried out an assessment of the current malaria diagnosis in Sierra Leone done. The assessment revealed that of the 8 health facilities visited, only about 20% of laboratory technicians had received post training on malaria diagnosis.

Supervision to laboratory technicians has been noted to be irregular. Based on the gaps in performing malaria diagnosis, the following need to be consider: all persons performing malaria microscopy should have refresher training every two to three years, refresher courses should be for a minimum of one week duration, refresher courses should include more stringent training on species identification and quantification and a competency assessment should be organized at the end of the refresher training

4.4.8 Malaria prophylaxis

The National Malaria Programme policy mentioned that Malaria prophylaxis is not necessary in persons living in a malarious area because it may lower ones resistance to the disease. However, it may be used in pregnancy, sickle cell anaemia and in non-immune visitors because of risk for severe disease, but it is not 100% protective.

In Sierra Leone, Malaria chemoprophylaxis is recommended for use in the following special groups:

i. Non immune visitors to areas of malaria transmission.
ii. Patients with sickle cell anaemia.
iii. Non immune pregnant women visiting areas of malaria transmission.

4.4.9 Performance indicators and targets

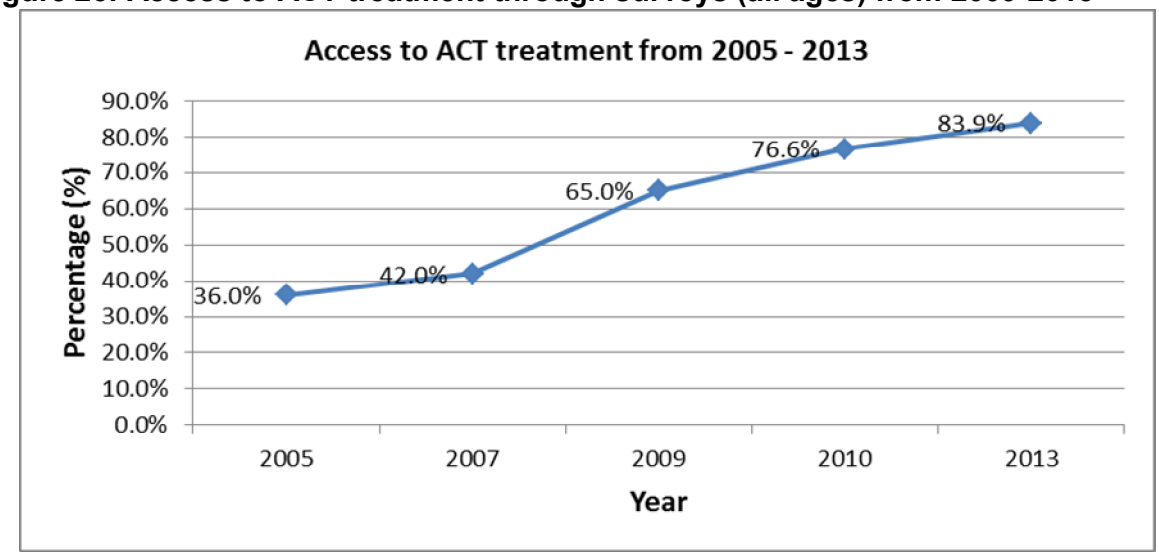
The table and graph below show the performance of NMCP on the access to ACT treatment indicator as stated in the national Malaria Control Strategic Plan 2011-2015.

Table 21: Review of access to ACTs treatment through surveys from 2009-2013

No	Indicator	%	Source
1	Among malaria classified patients, percentage given/prescribed ACTs	36.0%	NMCP Baseline Survey report, 2005
2	% of children under 5 years who sought treatment received ACTs	42.0%	CDC Population-Based Survey, 2007
3	Among malaria classified patients, percentage given/prescribed ACT	65%	Final Evaluation Malaria Outreach & Safety Initiative, Care Sierra Leone 2009
4	Percentage of children who took ACT	76.6%	Sierra Leone Malaria Indicator Survey, 2010
5	Percentage who took any ACT	83.9%	Sierra Leone Malaria Indicator Survey, 2013

Source: Population-Based Surveys

Figure 23: Access to ACT treatment through surveys (all ages) from 2009-2013



Source: Population-Based Surveys as indicated in the table above.

A linear progression was observed from 2005 (36%) when the anti-malaria policy was changed from monotherapy (Chloroquine) to combination therapy (ACT- using AS+AQ) as the first line treatment for uncomplicated malaria to 83.9% in 2013. The low access to ACT could be attributed to and not limited to supplies not regular, inadequate health facilities and not adequately equipped to treat malaria cases, staff shortage, access to treatment was only at the health facility level and also training of staff to the new treatment policy is irregular.

Access to ACT treatment is a very important indicator in reducing the adverse consequences of malaria in the country. It is observed that, health facilities are now reporting far less cases

of severe malaria than before. In part, this may be due to the availability of ACTs to all age categories free to cost and the implementation of the community case management of malaria aiming at increasing access to malaria treatment. This data were derived from population ï based surveys with nationally representative samples and have demonstrated significant improvements in care seeking for malaria treatment.

Access and knowledge about the policy of using ACTs (AS+AQ) to treat malaria is widely spread among Sierra Leoneans. In the MIS 2013, 33% of children had a fever in the two weeks prior to the survey. Of these children, 63% sought advice or treatment. Among children that had a fever, 37% took any ACT. 84 % of children under age 5 with fever who received antimalarial for treatment were given Artesunate + Amodiaquine (ASAQ), while 7% were given Chloroquine, 5 % received SP or Fansidar, 2 % were given Amodiaquine, and 2% of children with a fever were treated with quinine.

Considering the knowledge about prompt treatment, in the same survey among children with fever, about 32% took an ACT within 24 hours of onset of fever, or during the recommended timeframe.

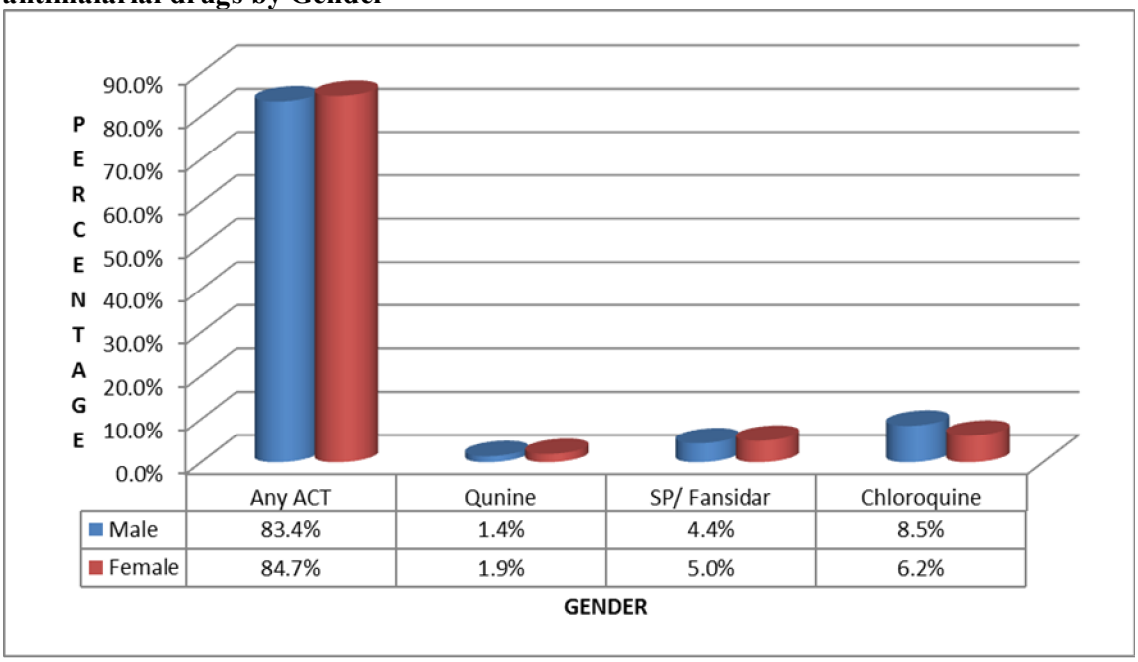
Concerning knowledge on where treatment was sought, the MIS 2013 survey revealed that among the 63 % of children with fever in the two weeks preceding the survey, treatment or advice for approximately two-thirds of children (74 %) was sought from the public sector. The majority of these children were taken to a government health centre (62 %), followed by 10 % who received advice or treatment from a government hospital, and 1 % from a mobile clinic.

4.4.10 Service Delivery, outputs and Outcomes

Among the regions, children living in the Western Region (51%) are almost twice likely to have taken an ACT compared with children in the Northern Region (29 %). By district, the proportion of children who took an ACT ranges from as low as 15 % in Port Loko to a high percentage of 60% in Western Area Urban. The proportion of children that took an ACT increases with an increase in motherôs education and wealth quintile.

Figure 24 also presents the percentage of children under five with fever in the two weeks preceding the survey who took any antimalarials medication, the percentage who took specific antimalarials drugs by gender. Overall, 83.4% of male took any antimalarial whilst only 8.5% took Chloroquine and in the females, those who took any antimalarials were 84.7% and for Chloroquine 6.2%. This graph revealed that the usage of Chloroquine monotherapy is uncommon compared to ACT use. For both genders, ACTs use is high.

Figure 24: Among children under age five with fever in the two weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial drugs by Gender

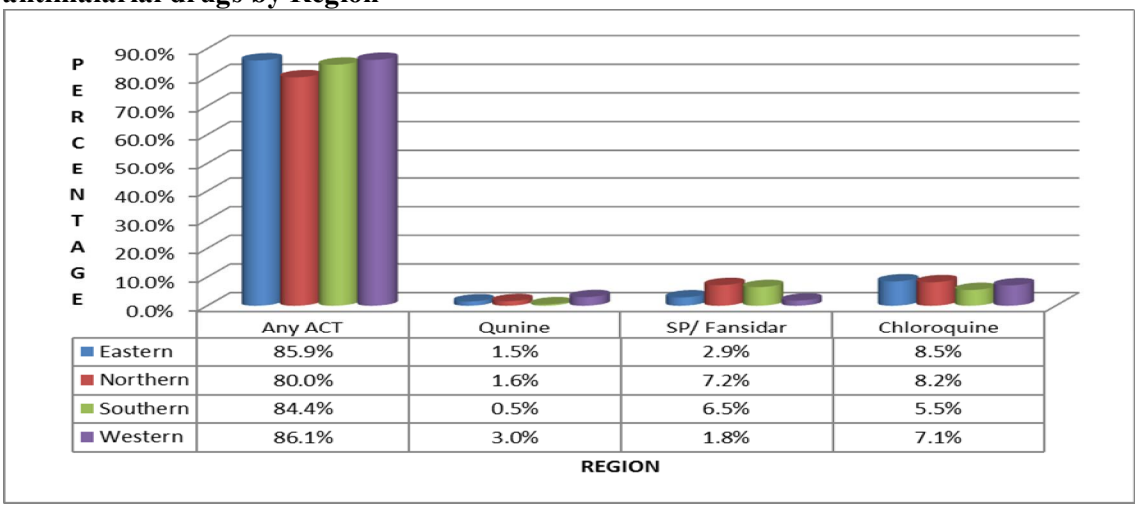


	Any ACT	Qunine	SP/ Fansidar	Chloroquine
Male	83.4%	1.4%	4.4%	8.5%
Female	84.7%	1.9%	5.0%	6.2%

Source: Malaria Indicator Survey, 2013.

When comparing the percentage of children under age five with fever in the two weeks preceding the survey that took any antimalarials medication by region, it is explicit that in the Western area about 86.1% took any antimalarials followed by the Eastern region with 85.9%, in the Southern Region 84.4% and the Northern region with 80.0%. Additionally, the use of Chloroquine monotherapy is low in all the regions but lowest been recorded as 5.5% in the Southern region. See figure 25 below for details.

Figure 25: Among children under age five with fever in the two weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial drugs by Region

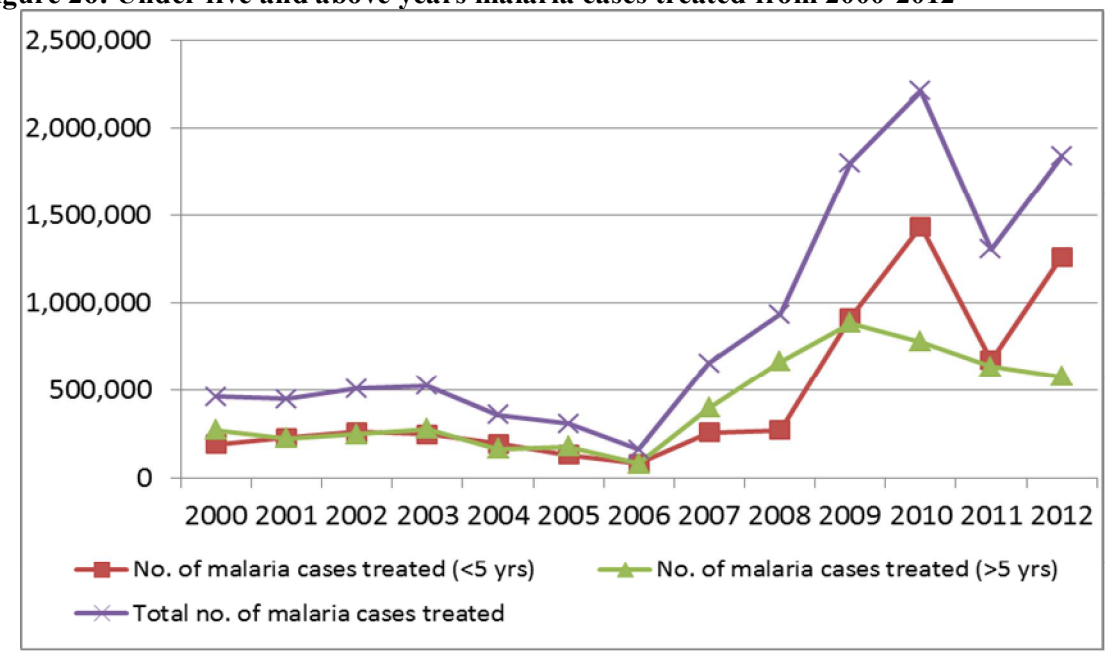


	Any ACT	Qunine	SP/ Fansidar	Chloroquine
Eastern	85.9%	1.5%	2.9%	8.5%
Northern	80.0%	1.6%	7.2%	8.2%
Southern	84.4%	0.5%	6.5%	5.5%
Western	86.1%	3.0%	1.8%	7.1%

Source: Malaria Indicator Survey, 2013.

Below is a graphical presentation of Routine HMIS data from 2000 to 2012 showing the trend of malaria cases for children under 5years and people above five years treated for malaria. It is observed that, from 2006 onwards, more cases were reported as there was increased support from the Global Fund Round 4, European Union through WHO, Global Fund Rounds 7 and 10. Also, data collection and reporting tools were revised to capture the current indicators as indicated in the WHO Monitoring and Evaluation Tool kit. Further, the introduction of the Free Health Care Initiative (FHCI) by the Government of Sierra Leone in 2010 significantly reduces the barriers to accessing health care services to the most vulnerable groups (Children under five years, Pregnant and lactating mothers)

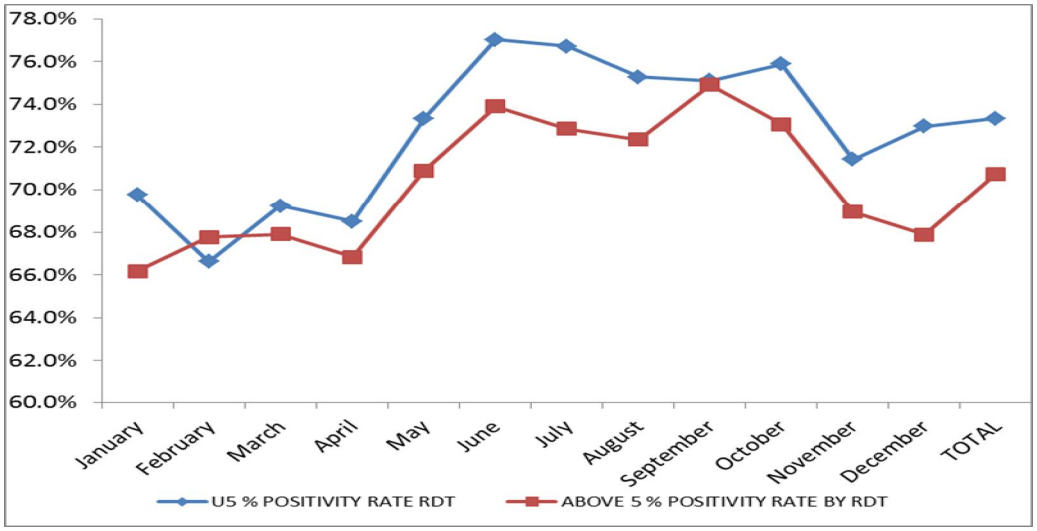
Figure 26: Under five and above years malaria cases treated from 2000-2012



Source: HMIS (DPC and NMCP database 2000-2012

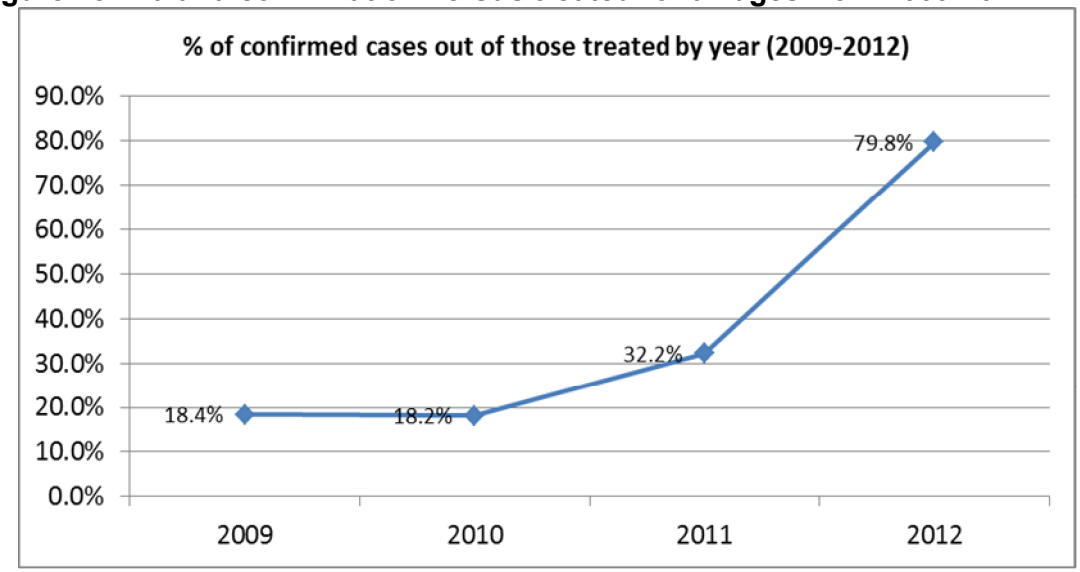
The policy of testing prior to treatment at community level has been adopted in 2012 is now at scale nationwide. Improvement in malaria diagnosis for all age categories was noticed in 2012. With support from the consolidated Global Fund Malaria Rounds 7 and 10, the availability of RDTs was very high after the revision of the malaria policy in 2010. Adherance to the malaria control policy is high (Test, Treat and Track) and this has contributed to minimising the degree of stockout of ACTs. On average, the RDT positivity for 2012 is 72.5%. Though not shown here, the slide Positivity Rate for microscopy for 2012 is 54% for all ages. Therefore, the new baseline for malaria positivity rate is 63%. The graph below shows the RDT positivity by month in 2012.

Figure 27: Malaria positivity rate by Rapid Diagnostic Tests (RDTs) by month in 2012.



Source: NMCP Database

Figure 28: Malaria confirmation versus treated for all ages from 2009-2012



Source: NMCP database

Confirmatory diagnosis of malaria has gradually improved over the years from 18.4%, 18.2%, 32.2% and 79.8% in 2009, 2010, 2011 and 2012 respectively. This is due to the increase in financial support to procure the RDTs and laboratory reagents. It is hoped that, adherence to the malaria policy will improve and all suspected cases will be confirmed before treatment.

Access and knowledge about the policy of using ACTs (AS+AQ) to treat malaria is widely spread among Sierra Leoneans. In the SLMIS 2013, 33% of children had a fever in the two weeks prior to the survey. Of these children, 63% sought advice or treatment from Health Facility. Among children that had a fever, 37% took any ACT. 84 % of children under age 5 with fever who received antimalarials for treatment were given Artesunate + Amodiaquine

(ASAQ), while 7% were given Chloroquine, 5 % received SP or Fansidar, 2 % were given Amodiaquine, and 2% of children with a fever were treated with quinine.

Among the regions, children living in the Western Region (51%) are almost twice likely to have taken an ACT compared with children in the Northern Region (29 %). By district, the proportion of children who took an ACT ranges from a low of 15 % in Port Loko to a high of 60% in Western Area Urban. The proportion of children that took an ACT increases with an increase mother's education and wealth quintile.

Considering the knowledge about prompt treatment, in the same survey among children with fever, about 32% took an ACT within 24 hours of onset of fever, or during the recommended timeframe.

Again in 2009 through 2012, treatments recorded were from health facilities and community level using the Community Based Providers (CBPs). CBPs were trained to treat malaria based on signs and symptoms.

Confirmation of suspected cases of malaria prior to treatment has been adopted by the Ministry, a total number of 997,400 of confirmed cases of malaria for children under five was recorded in 2012 at the health facility level and treatment was provided to 1,012,308 under-fives.

It is evident that more cases received treatment more than those tested. The reason for such variance could be, negative test results were still been treated with ACTs even though the policy mentioned that only positive cases should be provided with ACTs. Another reason might be not all cases are tested before treatment. However, the awareness is increasing gradually for people to know that they must be tested before treatment. Universal access should be a 100%.

At the PHU level, a total number of 444,023 above five age groups (Adolescent and Adult) were confirmed of having malaria and 469,201 patients were treated with ACTs. (The source of the above information is from routine data, NMCP) working on the graphical presentation.)

Comparing trends in prompt diagnosis and treatment, the graphs reveal a decline in achievements of the above indicators except for percentage who sought treatment from a health facility/provider same/next day which spans from 22.3% (2005), 15.1% (2008), 26.2% (2010) and 62.5% (2013). These results highlight the need to sensitize parents on the importance of seeking treatment for their children and in particular so in a timely manner.

While it is crucial that children under five receive medication within 24 hours of the onset of malaria, it is very clear that most care-givers are not doing this. Possible reasons for this are a) lack of awareness of the importance of treatment b) distance from health facilities/providers c) not utilising the services of the CHW at the community d) stock outs.

4.4.11 SWOT Analysis

Table 22: SWOT Analysis

ToRs	Strengths	Weakness	Opportunities	Threats
Assess progress towards implementation of current anti-malaria drug policy	-Tax waiver from all antimalarials products -Political will to support malaria control activities. -Availability of national malaria policy documents developed in collaboration with technical partners -Training of health service providers on case management (including the use of RDTs) guidelines -Availability of ACTs in all public and few private health facilities -Availability of job aides and treatment algorithms. -Availability of training manuals for case management. -Free treatment available in private facilities. -Increased use of quality assured drugs. - A decentralised health structure that is integrated into the health care delivery system and community level structures. -ACTs are available in the public health facilities, few private health facilities and faith	-Non adherence to the policy. -Staff shortage and transfers at facility level. -Intermittent stock outs of commodities -Inadequate supplies. -Service providers do not believe the test results. -Treatment interruptions not tended to quickly -Inadequate or late reporting from PHU and/or district -Under reporting at all levels -Organization of drug distributions from central to district level often inefficient -Funding constraints. -Use of monotherapies, including Chloroquine, Amodiaquine and Artemisinin derivatives.	- Introduction of confirmation before treatment at all levels. - Presence of the District Health Management Team in all the districts - Availability of policy documents. -Provision of antimalarials commodities at all levels. - High level political commitment.	- Inadequate trained human resources at all levels - Inadequate diagnostic facilities - Irregular supervision and monitoring at all levels - Under reporting - Over-consumption of ACTs due to presumptive diagnosis of malaria - Frequent transfer of health workers to other areas, causing discontinuity in services. - Slow pace of activity implementation (from proposal writing to activity implementation) - Late disbursement of funds to carry out activities.

ToRs	Strengths	Weakness	Opportunities	Threats
	based organizations at no cost for all categories of people.			
Assess progress towards implementation of current anti-malaria drug policy	-Introduction of AS+AQ fixed dose combination to improved compliance. Presence of DMFP in all the districts.			
Assess progress towards implementation Community Case management of Malaria	- CCMm services provided across the thirteen districts of Sierra Leone. -Strengthen linkage between the community and the formal health system. -Training of community based providers on diagnosis of malaria. -Confirmation of suspected malaria before treatment. -Supply of RDTs to CHWs to diagnose malaria -Provision of storage boxes for RDTs, -ACTs and reporting tools. -Presence of Community Health Workers to provide treatment -availability of CHW policy and Strategic plan. -availability of training manuals and treatment algorithm and job aides. -Communities identifying themselves to be key partners in operations and planning for successful programme implementation.	-There have been delays in procurement of drugs and other logistics and that affected the roll out of the intervention in most districts. -There have been challenges with respect to the supply chain.	- Acceptance of CCMm intervention in the community. - Availability of Community Health Workers to provide treatment at community level - involvement of partners -Existing structures at community level - Community involvement in the process of CHP.	- Inadequate community treatment charts/algorithm for Community Case Management of Malaria (CCMm). - Inadequate supplies - Frequent stock outs of needed antimalarials commodities. - Lack of motivation for CHWs to ensure the effective roll out of the intervention. - Misconceptions relating to Artesunate +Amodiaquine, and its potential complications/ side-effects. - High attrition rate of CHWS and need to replace and re-train them - Gender mainstreaming: involvement of female in the work of the community

ToRs	Strengths	Weakness	Opportunities	Threats
Malaria Diagnosis	- Roll out use of RDTs in all the thirteen districts including communities. - Available guidelines, Standard Operating Procedures (SOPs) and job aids, - Availability of diagnostics facilities at all levels - Availability of microscopes in Community Health Centres	- Intermittent stock outs of RDTs at all levels. - Supplies in the use of RDTs not available, e.g. disposable gloves. - Inadequate supplies of reagents to carry out microscopic investigation .	- Introduction of confirmation before treatment - Availability of a Community Health Programme policy and strategy - Establishment of a Technical Working Group for Community Health Programme - Acceptance of the policy of testing prior to treatment. - Increased number of partners.	- Non availability of supplies to carry out RDTs especially at community level. - Non adherence to the negative test results.
Review adequacy of systems in place for efficacy testing, quality assurance and adverse drug reporting	- Quality Assurance and Quality Control systems setup. - Availability of SoPs and Guidelines to carry out QA/QC of antimalarials commodities. - Availability of trained personnel to perform QA/QC. -Conduct therapeutic Efficacy Studies for antimalarial to closely monitor the usefulness of current antimalarial medicines in the treatment of the disease and recommend changes where/when required.	-Inadequate resources - Funds - personnel - Limited funding - Constraint in implementing the policy/best practice fully -	- Establishment of a QA/QC system.	- Inadequate personnel to carry out QA/QC of antimalarials commodities. - Low priority activity

4.4.12 Successes, best practices and facilitating factors

- Strong political will and Government commitment to the programme
- Tax Waiver on all antimalarials products.
- Introduction of confirmation prior to treatment at all levels.
- Free malaria treatment for all categories of people at all levels.
- Availability of National Malaria Policy documents (Treatment guidelines, Training manuals, etc.) job aides and treatment algorithms for all levels and some private facilities.
- ACTs are available in the public health facilities, few private health facilities and faith based organizations at no cost for all categories of people.
- Introduction of AS+AQ fixed dose combination to improved compliance.
- Presence of DMFP in all the districts.
- Conduct of antimalarial treatment efficacy and safety study.
- Collaboration with other priority programmes- EPI/CH, RCH,
- Definitive treatment of malaria.
- NMCP quality assured medicines used for treatment

4.4.13 Issues and challenges

Implementation of challenges Identified (Case Management)

1. Noncompliance to the policy of free malaria treatment
2. Intermittent stock outs of approved antimalarials commodities.
3. Use of Chloroquine and Artesunate monotherapy in treating malaria.
4. Non adherent to the recommended drug. 48.3% patients adherent to the drug of choice for UM (MSF SL, 2008/2009).
5. Training for health workers is irregular and inadequate.
6. Inadequate data generated at all levels.
7. Use of monotherapies, including Artemisinin monotherapies in treatment of malaria
8. Shortage of human resource
9. Limited funding
10. Transfer of health workers to other areas, causing discontinuity in services

Some Challenges Diagnostic

1. Inadequate funds to support integration of malaria diagnosis into general laboratory services
2. Lack of maintenance culture for microscope and other equipment
3. Inability to cope with workload therefore not routinely cross-checking slides (including lack of QA systems)
4. In adequate skilled personnel

Other Implementation Challenges (Community Case Management of Malaria)

1. Double RDT testing due to PHU staff not trusting RDT results from CHWs.
2. Limited community support to CHWs
3. Motivation and retention leading to CHWs abandoning their operational areas.

4. Difficulty in recruiting people with minimum literacy skills from hard to reach areas
5. Frequent stock outs of antimalarials commodities, e.g. RDTs and ACTs.
6. Inadequate gender mainstreaming into community level activities (gender considerations leading to few women participating).
7. Non adherent to the policy of confirmation prior to treatment. For CHWs implementing ICCM, treatment for malaria is based on signs and symptoms- not trained to use RDTs (5,200 CHWs).
8. Inadequate CHW supervision

4.4.14 Conclusion and Recommendations

Conclusion

1. Ensuring universal access to diagnosis and treatment by providing free malaria treatment at all levels of care in Government health facilities in all the thirteen districts.
2. Implementation of Community Case Management of Malaria nationwide.
3. Rolled out of RDTs at community level.
4. The policy of confirmation prior to treatment of suspected cases of malaria for uncomplicated malaria.
5. In Sierra Leone, 26% of people are still using mono-therapy to treat malaria (MIS 2013).
6. Awareness of treatment seeking to a health facility is increased from 68.7% in 2010 compared to 74% in 2013.
7. Surveys conducted have revealed an increase of children who sought treatment from a health facility/provider same or next day in 2010 was 26% (MIS 2010) and compared with an achievement of 62.5% in 2013 (MIS 2013).

Table 23: Synthesis of the NMCP performance in area of case management

Areas	Score				Comments
	3 : High Adequate	2 : Adequate	1 : Present but Inadequate	0 : Inadequate	
There is a written parasite-based diagnosis at all levels of the health system and it is adhered to			X		
There is a written parasite based diagnosis document at all levels		X			
All the different levels of health care adhere to the written policy			X		
There is a system for diagnosis, QA/QC that includes laboratory network system, with a competent workforce, guidelines and strategic plan for its implementation		X			

Areas	Score				Comments
	3 : High Adequate	2 : Adequate	1 : Present but Inadequate	0 : Inadequate	
There is a written diagnosis and treatment guidelines that has been communicated to all levels of health care and is adhered to			X		
Home management of malaria is implemented in all malaria endemic districts	X				
Policies on free acess or highly subsidised ACT by private sector			X		
National ban on use of artemisinine monotherapies			X		
Supervision and capacity building on MCM			X		

Recommendations

- Improve access to quality assured diagnostics and treatment services.
- Enforce the ban on prescription, importation and use of mono-therapies for the treatment of uncomplicated malaria
- Continue monitoring the use of ACTs.
- Strengthen the quality assurance and control system at central and district level.
- Scaling-up use of RDTs in both the public and private sectors and providers need to be trained on their appropriate use.
- Ensure adequate funding for Community Case Management of malaria activities.
- Ensure inclusion into the training institutions curriculum malaria policy and guidelines and provide training for tutors and facilitators.
- Strengthen support systems for supportive supervision at all levels.
- human resource development

4. 5 Advocacy, BCC, IEC and Social Mobilization

4.5.1 Introduction

The National Malaria Control Programme and the Health Education Division of the Ministry of Health and Sanitation in collaboration with partners are the designated authorities charged with the responsibility of developing, producing and disseminating IEC/BCC materials for malaria prevention and control through multimedia channels in Sierra Leone. When the first 5-year Malaria Strategic Plan (2004-2008) expired, the National Malaria Control Program developed a new strategic plan and updated it for the period 2011 ï 2015. The strategy indicates Advocacy, Behaviour Change Communication and Community (Social) Mobilization as a complementary strategy to vector control and case management of malaria.

Integrated approaches in the delivery of Information, Education and Communication (IEC) messages on malaria control interventions are critical in the prevention and control of malaria. The Ministry of Health and Sanitation, together with other Ministries and partners, developed, revised and updated a Behaviour Change Communication (BCC) Strategy for the period 2012-2015 to guide the implementation IEC/BCC interventions for malaria. The revised malaria BCC strategy aims to scale up Community-Based Interventions in Sierra Leone as a vehicle to the reduction of current levels of malaria morbidity by 50% and mortality by 25% in the whole population, especially children under five and pregnant women, in all districts of Sierra Leone by 2015.

Currently, Knowledge of malaria among households heads is high (97.2%) but relatively low (31.9%) for the danger signs and symptoms (KAP, 2012). Knowledge in at least one domain (causes, symptoms, prevention or treatment) was found to be at 90.1% while knowledge in all domains was very low at 0.8% (MIS 2013). Household ownership of LLINs has increased from 25.9% 2008 (DHS) to 62% in 2013 (MIS). Percentages of pregnant women and Children under-five years sleeping under an ITN were found to be 75.9% and 69.2% respectively (MIS, 2013. The uptake of the 2nd dose of Sulfadoxine ï Pyrimethamine (SP) for IPT among pregnant women is 62% (MIS, 2013)

4.5.2 Policy and Guidance

Sierra Leone has *National Health Promotion Policy* ï 2010 which identifies strategies, activities, time frames, responsible persons and indicators for promoting health in the country. The *National Malaria Control Policy 2010* was jointly developed with partners with the following undermentioned documents.

- The NMCP Strategic Plan 2004 ï 2008
- NMCP Strategic plan to scale Community-based interventions 2008-2012
- The NMCP Strategic Plan 2011 ï 2015
- Basic Package of Essential Health Services for Sierra Leone in 2010. As part of the package, Community Health Workers (CHWs
- Health Education Policy 2000
- National malaria Communication Strategy 2012-2015

The National Malaria Communication Strategy (draft) was revised in 2012 after the KAP survey in the same year. The BCC strategy specifically, addresses the gaps on key benefits to target groups and barriers to positive malaria control behaviours towards:
- Malaria Case management & Community Case Management of malaria (CCMm),
- Universal ITN/LLIN coverage
-Intermittent Preventive Treatment
-Indoor residual spraying
-Environmental Sanitation.

4.5.3 Organization

The Health Education Division (HED) of the Ministry of Health and Sanitation (MoHS) provides leadership and coordinates the implementation of health promotion interventions in the country. The National Malaria Control Programme (NMCP) works with HED and partners to ensure consistency in messaging for malaria. Commemoration of World Malaria Day on the 25th April each year is annually done by MoHS in partnership with RBM partners. The Ministry celebrates MCHW twice yearly (May & November). These events provide opportunity at the District level for individuals and households, particularly those in underserved communities, to have access to a package of maternal and child health services, including malaria prevention messages, commodities and care.
At district levels, malaria communication is integrated into routine ANC /EPI & outreach sessions

4.5.4 Human resources, training and capacity development

HED is responsible for development of policies on ACSM at the national level in partnership with NMCP and other partners. At district level, there are Social mobilisation officers /HED officers responsible for health promotion activities covering all technical areas, including malaria. Malaria Focal points are also in all districts to give support in IEC/BCC activities. The following training manuals were available to conduct trainings at community level.

- A Peer Health Education (2008) and Teachers Training manuals (2008
- Manual for teachers on the Management of malaria in schools 2008.
- Community Oriented Resource Persons (CORPS) Training manual 2008
- BRAC Community Health PromotersôManual *
- Malaria-Free Sierra Leone Manual for Community Health Committee and School Health Clubs ï 2012*
- Community Health Workers Training Manual *

Other health workers such as SECHN, CHOs, CHAs, MCHAs, and CHWs assigned the responsibility for BCC and community mobilization.
NGOs recruit health promoters in their operational areas to provide added capacity for malaria BCC and community mobilization efforts, at that level.

4.5.5 Annual planning

Similar to other thematic areas, IEC/BCC planning is part of the integrated Programme and annual health plans at all levels of the health service.

Special plans and proposals are however developed by the NMCP and Health Promotion Department for additional funding and resources such as to Global Fund and other earmarked partner support.

4.5.6 Performance indicators and targets

The National Malaria Control Strategic Plan for 2011 to 2015 is accompanied by a costed Monitoring and Evaluation (M & E) Plan. The strategic plan states that in the area of behaviour change communication, the undermentioned objective will be achieved: ***To increase the knowledge, attitudes and skills of the general population towards the use of preventive and control measures against malaria from the current level to 80% by 2015.***

In order to achieve the above objective, the following indicators were developed in the strategic plan and the M & E plan:

i. Percentage (%) of people nationwide with knowledge of at least one method of prevention and control of malaria
ii. Percentage (%) of persons in a household who practice at least one method of malaria prevention and control.
iii. Percentage (%) of people (or target groups) who know the causes of, symptoms of, treatment for or preventive measures for malaria;
iv. Number and percentage (%) of active community health clubs mobilized to deliver BCC outreach activities;
v. Number and percentage (%)of in-school youth participating in school health clubs that include at least one malaria module;
vi. Number and percentage of district stakeholder sensitization meeting held on IRS;
vii. Number and percentage of community stakeholder sensitization meetings held on IRS; and
viii. Number and percentage of community sensitization meetings conducted on IPT, LLINs and CCMm.

Surveys have been conducted to measure progress towards achieving the objective of increasing the percentage of people having access to at least one preventive method such as LLINs, IRS and/or other method from 25.9% to 80%. With two years leading to 2015, the country has achieved the following:

- Household ownership of LLINs has increased from 25.9% 2008 (DHS) to 62% in 2013 (MIS) and only 6% of households surveyed reported having been sprayed with IRS in the last 12 months. This is because IRS was only piloted in 4 of the 13 districts on a limited scale (SLMIS 2013);
- According to the KAP survey (2012) Knowledge of malaria among households heads was high (97.2%) but relatively low (31.9%) for the danger signs and symptoms.
- Knowledge in at least one domain (causes, symptoms, prevention or treatment) was found to be at 90.1% while knowledge in all domains was very low at 0.8% (MIS 2013).

The Ministry of Health and Sanitation and its co-implementing partner, Catholic Relief Services, along with RBM partners developed targets for the above indicators as part of the Global Fund Malaria Round 10 proposal.

4.5.7 Service Delivery outputs and outcomes

Every year Sierra Leone joins the rest of the world to celebrate World Malaria Day which normally falls on 25th April under specific theme. During this period, NMCP hold regular meetings with RBM partners to plan mobilise resources and implement activities together throughout the country. The following activities are normally conducted:

- Press briefings at national and regional levels.
- Airing of jingles in the local dialect using community radio stations countrywide
- Radio and TV panel discussion programmes
- Interschool quiz, drama and song competitions
- Mobile text messages using mobile phone companies
- Printing of Flyers/brochures
- Launching of World malaria Day at national, district and Chiefdom levels.
- A nationwide broadcast by the Minister of Health and the WHO Country Representative

The launching of WMD is normally done by the Minister of Health with Statements made by other high profile personalities to advocate for support and more resources for malaria control.

4.5.8 SWOT Analysis

Despite the progress made towards achieving the objectives of the Nation Behaviour Change Communication Strategy, the review identified some strengths and opportunities that can be maximized on as well as weaknesses and threats that need to be responded to, ensuring achievement of the objectives of the Strategy.

Several factors contributed to making malaria prevention and control visible in the country. The review found the following strengths and weaknesses as well as opportunities and threats for malaria advocacy implementation:

Table 24: ACSM SWOT Analysis

Strengths	**Weaknesses**
Å Political commitment-increase budget allocation to health Å Removal of tax waiver on malaria commodities Å More Implementing partners coming on board especially with regards to nets distribution & ACSM activities-Civil Society, Interfaith etc.) Å Existence of partner supported programmes like UNICEF, WHO , NGOs Å Presence of functional local councils in the 13 districts (decentralization). Å Strong support by NGO partners to scale up community based interventions Å Celebration of World Malaria Days-	Å Far more focus is placed on health partners with little or no engagement with other sectors like Ministries of Agriculture, Education, Roads and Transport, etc. Å Draft BCC strategy

(Minister of Health and other influential leaders play a key role)	
Opportunities Å Continued engagement of Religious leaders and in school youths to intensify advocacy and dissemination of malaria messages.	**Threats** Å Uncertainties associated with external funding. Å Limited funds to conduct activities

Table 25: BCC/Community Mobilization-SWOT Analysis

Strengths Å Coordination of partners in doing BCC/Social mobilization Å Harmonization of all malaria materials done to ensure message consistency Å Community engagement and ownership of malaria programmes Å Availability of commodities to back communication intervention	**Opportunities** Å Maximize on upcoming partner supported projects Å Exploiting media interest Å Celebrations of International Days eg. World malaria Day
Weaknesses Å Inadequate IEC/BCC materials in the communities. Å Lack of supervision/monitoring	**Threats** Å Inadequate internal funds to intensify and sustain communication activities Å Progress and performance in achieving annual targets and strategic targets

4.5.9 Successes, best practices and facilitating factors

- National Coordination, Delivery Capacity, Structures and Systems with identification of National Communication focal point for Program and Partners.
- Functional National Social Mobilisation Committee responsible for coordinating all health communication activities including malaria.
- Availability of a National Malaria Behavior Change and Strategic Communication and Strategic plan 2010- 2015 (Reference Document for all partners)
- National Champions for malaria control- parliamentarians, traditional, religious and community leaders (strong support from the leaders to advocate as Malaria Champions during the nets distribution
- Celebration of World Malaria Days- (The Minister of Health and other influential leaders played key role)
- Advocacy materials developed but needs to be revised and updated for use.
- Tax waiver on all Antimalarial medicines and commodities
- Students as peer health educators in schools and out of schools
- Introduction of the malaria self-assessment competence tool on the 14 best practices

4.5.10 Issues and Challenges

❖ Inadequate funding
❖ Inadequate capacity in producing IEC material at local level
❖ No tools to track IEC/BCC activities

- ❖ Inadequate skills for BCC/SM design, implementation and monitoring at the various levels
- ❖ Communication gap between DHMT and hospital staff on IEC/BCC. The posters arrive at central level but not diffused and explained to the hospital
- ❖ Non-inclusion of behavioural indicators in the strategic plan.
- ❖ Inadequate IEC/BCC materials at district and community level
- ❖ Research- No clear cut advocacy related KABP showing Advocacy impact on malaria control identified.

4.5.11 Conclusion and Recommendations

Table 26: Key Issues and Action Points

Key Issues	Action Points
1. Inadequacy of funds from SLG and sustainable external funding. 2. Little or no engagement with other sectors (Education, Roads & Transport, etc.) 3. Interventions not translating to improved knowledge and practice 4. Inadequacy of trained personnel 5. Difficult and hard-to-reach areas 6. Absence of indicator for monitoring proportion of population reached with BCC/IEC	1. Resource mobilisation 2. Improve coordination and engagement of potential partners 3. Ensure quality of delivery of interventions and periodic evaluation including barrier analysis. 4. Scale-up capacity building at all levels 5. Intensify advocacy & BCC campaigns at all levels 6. Review/update relevant policies and guidelines including review of IEC/BCC indicators and targets to incorporate behavioural objectives

4.6 Malaria in pregnancy

4.6.1 Introduction

Malaria is endemic in Sierra Leone and constitutes a major public health challenge. It accounts for about 40% outpatient morbidity with an estimate of 2,240,000 outpatient visits. Pregnant women constitute 4.4% of the total population and are among the most vulnerable groups. (National Malaria Strategic Plan 2011-2015).

The current practice of prevention and treatment of malaria in pregnancy is based on available evidence on WHO recommendation using the three-pronged approach:

- Promotion of Insecticide-treated nets (ITNs)
- Administration of Intermittent preventive treatment
- Effective case management of malarial illness
- In addition focused antenatal Care (ANC) which should include health education on malaria

The prevalence of parasitaemia appears greatest in the second trimester, and susceptibility to clinical malaria may persist into the early postpartum period.

In view of the endemicity and high transmission of malaria in Sierra Leone, pregnant women are susceptible to sub-clinical infections which may result in maternal anaemia and placental parasitaemia, both of which may subsequently lead to low birth weight (LBW). It has been established that pregnancy quadruples a womanôs risk of malaria illness and doubles her risk of deaths. In the rural areas, approximately 35% of pregnant women are affected by malaria and among them primigravidae show the highest prevalence of about 50% (WHO fact sheet).

The problem has long been neglected, but new approaches and commitment offer hope for reducing the burden of malaria in pregnancy and improving the health of mothers and new-borns.

Currently, 62% of pregnant women took the 2nd dose of SP as IPT during their last pregnancy and 76% are sleeping under an Insecticide treated nets (ITNs) as stated in the Malaria Indicator Survey (2013).

Antenatal Clinic attendance has increased to over 90% as a result of increased access to ANC services and availability of SP at community and PHU levels. Additionally, the Free Health Care Initiative has contributed to the high performance on this indicator.

4.6.2 Policy and Guidance

Policies and guidelines for the prevention and treatment of malaria are in place. The following documents are available:

(i) *National Malaria Control Policy 2010* designates the National Malaria Control Programme/MOHS and its partners jointly developed this document. Sierra Leone has adopted the use of IPTp for malaria in pregnancy as one of the intervention packages

aimed at making pregnancy safer and has endorsed the use of Sulfadoxine-Pyrimethamine (SP) for IPT.

(ii) *The National Strategic Plan to scale up Community-Based Interventions (2007-2012).* To scale up for impact, a draft strategic plan was developed with partners to scale up community-based interventions for the prevention and control of malaria in Sierra Leone.

(iii) The *National Malaria Control Strategic Plan 2011 – 2015* aims to increase access to the uptake of at least two doses of Intermittent Preventive Treatment (IPTp) among pregnant women at health facility and community levels from 72.3% to 90% by 2015.

(iv) *Guidelines for the Case Management of Malaria in Sierra Leone, 2010* states that treatment for Malaria in pregnancy is oral Quinine during the 1st trimester, and Artesunate +Amodiaquine combination or quinine during the 2nd and 3rd trimesters. Oral quinine 600mg should be administered three times per day for seven days. The drug of choice for the treatment of severe malaria is parenteral Quinine. Other recommended alternatives are parenteral Artemether or Artesunate.

Ministry of Health and Sanitation in collaboration with partners developed the above Malaria Policy and treatment guidelines in 2005. The malaria policy and malaria case management guidelines were then updated t in 2010 to reduce the burden (Morbidity and mortality) of malaria in pregnancy. The IPT guidelines (2005) are yet to be revised. In the policy, the strategies for implementation and the treatment guidelines are addressed, since over 80% of pregnant women do make at least one ante natal visit. All pregnant women must receive at least two doses of SP as IPT after quickening has been established at antenatal visit and an additional dose (3 doses) for those that are HIV positive. The use of LLINs is also integrated in the minimum ANC package to be distributed at 1st ANC visit and after heal

4.6.3 Organization of MIP service delivery

Currently, the Public Health Sister in the programme is the focal point for Malaria in Pregnancy at National level. She coordinates and monitors planned activities of DHMTs and NGOs in the country.

Malaria in Pregnancy preventive interventions (ITN/LLIN and IPTp) are mainly executed in Sierra Leone through the RCH network of services from district through the District Health Management Teams (DHMT) into the chiefdoms at Community Health Centres (CHCs), Community Health Posts (CHPs), Maternal and Child Health Posts (MCHPs) throughout the country. Treatment services are however provided through the routine integrated maternal and child health services at the health facilities both at public and some private facilities.

4.6.4 Human resources, training and capacity development

State Enrolled Community Health Nurses (SECHNs), Community Health Officers (CHOs), Community Health Aides (CHAs), Maternal and Child Health Aides (MCH Aides), as well as doctors and Midwives are the key health staff that provides the above MIP services.

4.6.5 Annual planning

MIP planning is part of the integrated Programme and annual health plans at all levels of the health service. Special plans and proposals are however developed by the NMCP for additional funding and resources such as to Global Fund and other earmarked partner support.

4.6.6 Performance indicators and targets

Surveys have been conducted to measure progress towards achieving the objective of increasing the percentage of pregnant women receiving IPT under direct observation (1st dose & 2nd dose) at health facility level from 72.3% to 90%) by 2015.

Prevention and Treatment Indicators

The National Malaria Control Strategic Plan for 2011 to 2015 is accompanied by a costed Monitoring and Evaluation (M & E) Plan. The plan states that in the area of multiple disease prevention indicators (including the prevention of malaria in pregnancy), the following overall objective will be achieved:

To increase access among pregnant women to at least two doses of Intermittent Preventive Treatment (IPTp) at community and health facility levels from 72.3% to 90% by 2015.

In order to achieve the above objective, the following outcome indicators were developed:

(i) % of pregnant women receiving at least two doses IPT under direct observation during 2nd /3rd trimesters (baseline: 72.3% MIS 2010).

(ii) % of targeted health workers trained on the implementation of IPT in targeted Ante-natal Clinics (baseline: 48.2% 2006 NMCP reports).

(iii) % of pregnant women who receive LLIN during Ante- Natal Clinics (baseline: 70.3% 2009 Routine data).

(iv) % of pregnant women who report having slept under LLINs the previous night (baseline: 46.8% MIS, 2010).

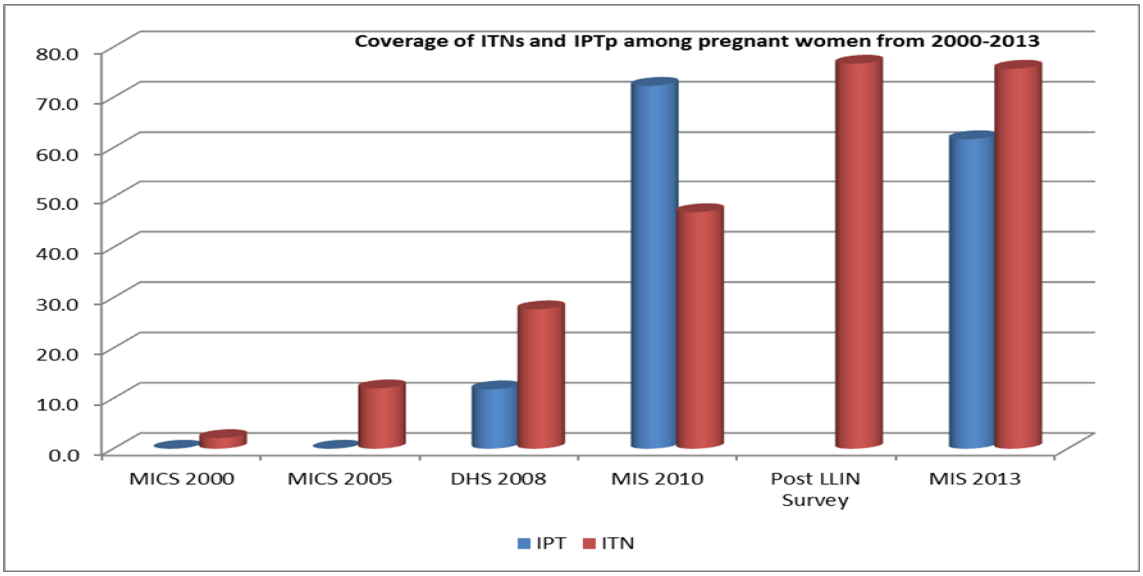
Table 27: Annual, medium and Long-term targets

Increase access among pregnant women to at least doses of IPTp at community and health facility levels from 72.3 % to 90% by 2015						
Indicator	**Baseline**	**Targets**				
		2011	**2012**	**2013**	**2014**	**2015**
% of pregnant women receiving at least 2 doses IPT under direct observation during 2nd/3rd trimesters	72.3% (MIS 2010)	80%	85%	85%	90%	90%
% of targeted health workers trained on the implementation of IPT in targeted Ante-natal Clinics	48.2 % (2006 NMCP Reports)	65%	80%	80%	80%	80%
% of pregnant women who receive LLIN during Antenatal Clinics	70.3% (2009 Routine data)	78%	80%	80%	80%	80%
Increase the utilisation of at least one prevention method, Long Lasting Treated Nets (LLINs), IRS and other appropriate methods among especially vulnerable groups such as children under-five years and pregnant women, to 80% by 2015.						
% of pregnant women who report having slept under LLINs the previous night	46.8% (MIS 2010)	75%	78%	80%	80%	80%

4.6.7 Service Delivery outputs and outcomes

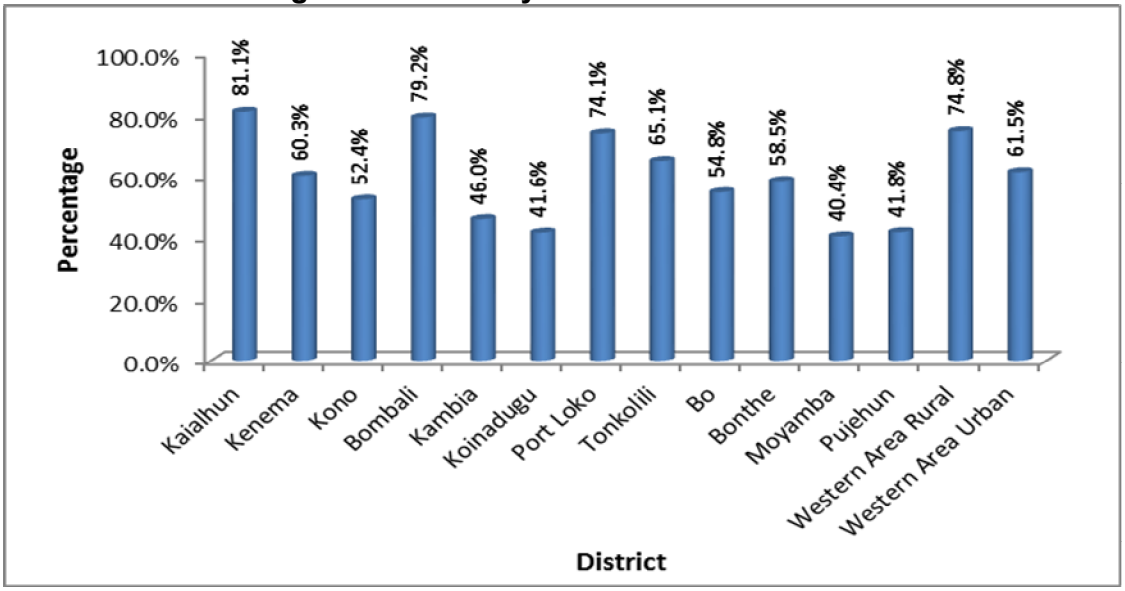
Figure 32 below gives a graphic illustration of the trend of both IPTp and ITN/LLIN use among pregnant women from the year 2000 to 2013. With respect to the objective of providing at least 2 doses of Sulphadoxine-Pyrimethamine (SP) under direct observation (IPTp2) to 90% of pregnant women by 2015, figure 31 shows there was some modest increase recorded. IPTp2 coverage increased from 2% in year 2005 to 69.2% in 2013 (SLMIS 2013). A similar increase was recorded in the use of LLINs by pregnant women: from 2 % in 2000 (MICS 2000) to 76% (SLMIS 2013).

Figure 29: ITNs and IPTp coverage among pregnant women



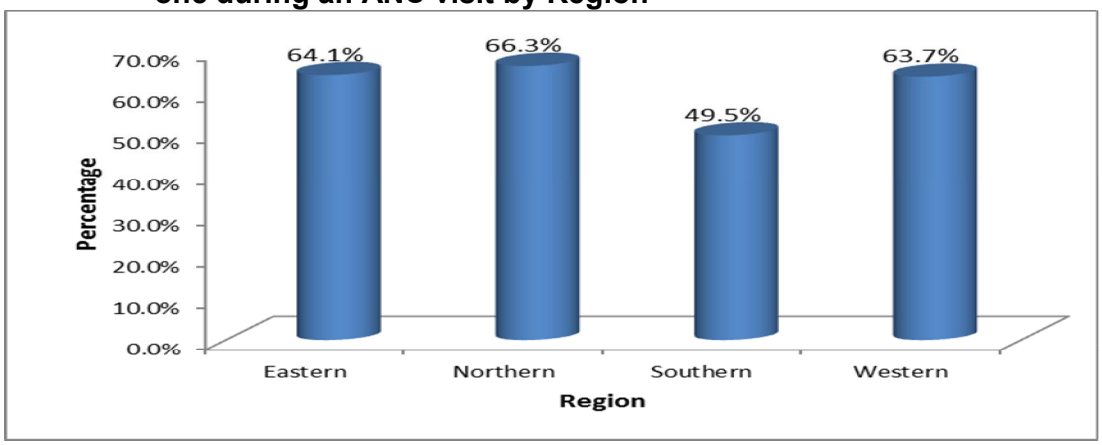
Source: Population-based National surveys, 2000-2013

Figure 30: Percentage who took 2+ doses of SP/Fansidar and received at least one during an ANC visit by District



Source; SLMIS 2013

Figure 31: Percentage who took 2+ doses of SP/Fansidar and received at least one during an ANC visit by Region



Source: SLMIS 2013

4.6.8 SWOT Analysis

Table 28: SWOT Analysis

Strength • High political commitment to the Programme • Improved coverage of IPT • Free Health Care Initiative in place • Resource collaboration from the following partners, Global Fund, NGOs • Health facility workers have been trained on MIP • TBAs have been trained to administer SP in the communities • Malaria policy, treatment guidelines and training manuals on MIP available • Administration of SP using DOTs strategy • SP availability at health facilities and in the communities • Reporting tools available • Reference materials and IEC materials available on MIP	**Weakness** • Coverage limited to Government health facilities at ANC and outreach points and with TBAs • Knowledge gap on complications of MIP among Pregnant women • Weak Public /Private partnership • Limited funding for effective programme management • Limited/irregular supervision and monitoring at all levels (District, PHU, outreach service) • Sometimes Stock out of Antimalarial medicines at health facilities • TBAs not motivated (monetary or otherwise) • Some illiterate TBAs assisted in reporting by other community members • Inconsistency of ITNs/LLIN supplies to district level • Impact indicators not monitored as stated in the national guidelines • Adverse effects (Pharmacovigilance) of SP not monitored • Absence of data on malaria cases confirmed in pregnant women in the data base at district and national level • Storage problems for ITNs/LLINs at PHU and district level • Misuse of ITNs
Opportunity • There is commitment on the side of all funding partners- GFATM • Integration with RCH Directorate • NMCP/Government plan to conduct integrated LLIN campaign in May 2014 • Health Ministry now a devolved sector • Ownership of the programme by the communities **Opportunity**	**Threat** • Emerging drug resistance of Antimalarial medicines • Inadequate funding especially for commodities • Medical Practitioners may be reluctant to use the recommended medication during the first trimester because of the side effects of quinine monotherapy. **Threat** • Side-effects of SP

• ANC coverage increasing and IPT is part of integrated package. • Outreach services in the districts • Presence of NGOs in the districts (e.g. provision of transport for outreach) • Willingness of TBAs to do IPT • Recognition of TBAs by Pregnant Women (PW)	• Unauthorized charges/fees by health workers • Presence of quacks / drug peddlers • Use of SP for treatment • Hard to reach areas

4.6.9 Successes, Best Practices And Facilitating Factors

The following are some of the successes, best practice and facilitating factors for malaria in pregnancy in Sierra Leone:

- Availability of policy and guidelines for MIP
- Outreach service of health facilities up to community level
- Collaboration between Reproductive and Child Health Directorate and other relevant partners in the districts.
- Support from partners (GFATM) for MIP interventions.
- Provision of free ITNs to pregnant women at 1st ANC visit & Health Facility delivery
- Provision of free SP to pregnant women after quickening during ANC visit at the Health Facility at community level.
- Antimalarial medicine included in Essential Medicines list

4.6.10 Issues and Challenges

Å Poor coordination between DMHT and hospital staff
Å Weak collaboration between NMCP and RCH directorate
Å Guidelines were not available at hospitals and some PHUs
Å Poor data collection and reporting ï poor documentation
Å NGO using own register and not possible to know whether client has done 1st or 2nd or 3rd dose of IPTp
Å Outdated IPT policy guideline
Å Hospital staff not trained on MIP

4.6.11 Conclusion and Recommendations

Table 29: Key Issues and Action Points

Key issues	Action Points
1. No existing technical subcommittee for coordination of activities. 2. Outdated IPT guidelines 3. Weak Public /Private partnership. 4. Lack of data on the use of SP. 5. Poor monitoring of SP efficacy & reporting of Adverse effects (Pharmacovigilance) 6. No plan in place for resource mobilisation	1. Formation of a technical subcommittee for planning and coordination of MIP activities within the RBM Taskforce. 2. NMCP and partners to review and update the current Malaria Policy and IPT guidelines 3. Improve coordination and engage partners. Revitalize information sharing among RBM partners on MIP 4. Strengthen M&E and operational research 5. Develop QA/QC system for IPT **6.** NMCP & partners to develop a sustainable resource mobilisation plan **(involve the private sector).**

4.7 Surveillance, Monitoring and Evaluation

4.7.1 Introduction

The Monitoring and Evaluation (M&E) system of the National Malaria Control was reviewed in October 2011 using the M&E System Strengthening Tools (MESST 2006 version).

The recommendations of the review exercise to strengthen this system are included in the M&E activity plan of the NMCP Monitoring and Evaluation Plan 2011-2015. This document is a framework for monitoring and evaluating the level of implementation of the National Malaria Strategic Plan for the period 2011 ï 2015. The specific M&E actions to be undertaken will generate information that will enable the National Malaria Control Programme (NMCP) to monitor the performance of the Programme.

The M&E plan describes the goals of the national Health M&E plan including key definitions of malaria monitoring and evaluation, the M&E framework, the indicators, data collection methods and data quality checks among other things. It also describes how the M&E plan will be implemented, M&E budgeted activities that will ensure that the necessary data are collected, analyzed and disseminated to relevant stakeholders.

In Sierra Leone, malaria is endemic all year round with seasonal variations at the start and end of the rainy season. It is presently the leading cause of morbidity and mortality amongst children under five years of age. It is the first on the list of Government priority diseases. The entire populace is at risk of developing the disease accounting for over 40.3% of outpatient morbidity, but the most vulnerable groups are under-five year old (U5) children and pregnant women. Malaria is a major threat to socio-economic development of the country with an estimated 7-12 days lost on the average per episode of malaria.

Surveillance is defined as ñthe on-going systematic collection, collation, analysis, presentation and interpretation of data, and the timely dissemination of public health information for assessment and public health responseò.

With regards to malaria, passive surveillance is used to collect data on suspected, confirmed and treated cases that report to health facilities and communities. These cases are recorded using under five and general disease/clinic registers and then reported on a monthly basis to DHMTs through the health management information system (HMIS). To improve timeliness, data are submitted to DHMTs not later than the 5th day after the end of the month.

At district level, Data Entry Clerk receives, enter and verify data from health facilities at the end of every month. The District M&E Officer coordinates and supervises all the data management procedures in the district. He/She ensures data quality including completeness, correctness, consistency and timely transmission of district data/reports to the Directorate of Policy, Planning and Information (DPPI) of the Ministry of Health and Sanitation.

Even though Sierra Leone is an endemic country for malaria, all suspected malaria cases (Fever) are confirmed before treatment (Revised Malaria Policy, 2010). Laboratory confirmation is done by the use of RDT kits (PHUs and Communities) and microscopy

(Hospitals) before treatment. However, for surveillance purposes, standard criteria have been developed to assist health workers in the diagnosis of cases especially in remote areas with no laboratory facilities.

4.7.2 Policy, Guidance, Coordination

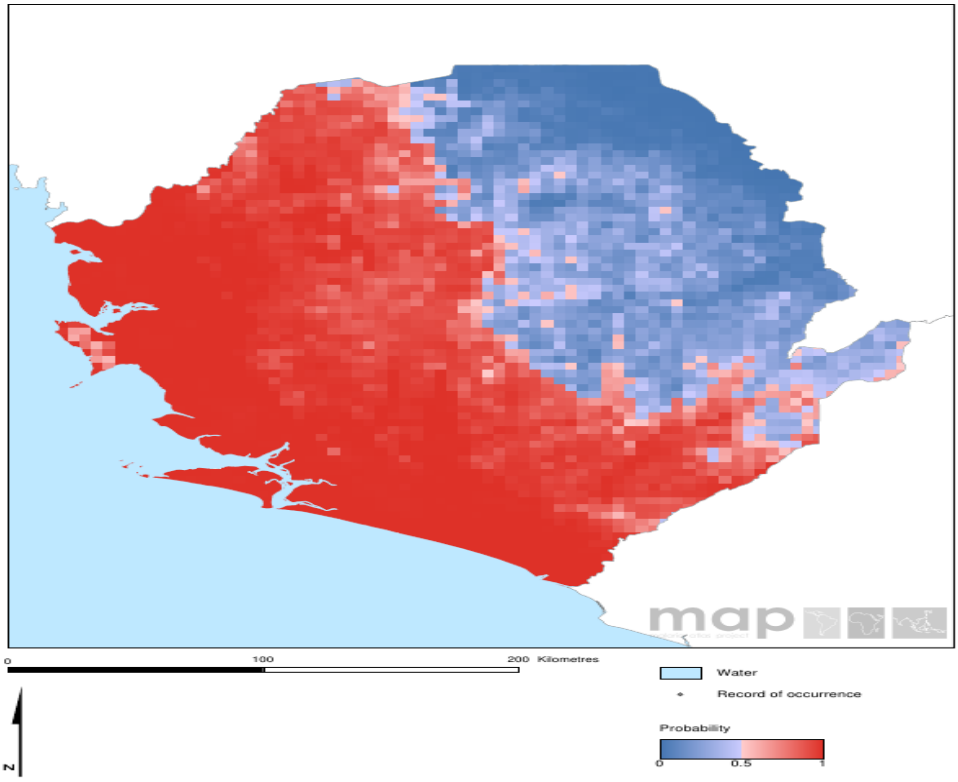
See 2.9 and 4.3.2

4.7.3 Malaria Country Profile, Risk Mapping and Stratification

The recent Malaria Indicator Survey (MIS,2010) reveals that, 50.4% of children under five years of age receive prompt and appropriate treatment of malaria according to national policy. Access to treatment by children under five years at health facilities and communities is 57.0% and 28.7% respectively. The percentage of those children with fever that sought treatment and received an ACT in the previous 2 weeks is 42.3% (CDC population based survey 2007).
The baseline survey conducted in 2005 revealed that the Intermittent Preventive Treatment in pregnancy (IPTp) usage rate was low, about one in five mothers (22%) had it in the last pregnancy and about 19% took at least 2 doses. The percentage of pregnant women receiving IPTp at Antenatal Care (ANC) clinics is 42% (Routine Data 2007) and 11% (DHS, 2008) respectively. The proportion of pregnant receiving at least two doses of IPTp increased to 72.3% in 2010 from the routine HMIS data.

According to survey conducted in 2005 the ownership of LLINs was 2% (MICS, 2005) and increased to 37% in 2008 (DHS, 2008). Considering the scope of malaria problem in Sierra Leone and the commitment to achieve universal coverage of LLINs by the end of 2010, a mass distribution of LLINs was conducted in 2010. Through a network of Global Fund (GF) partners and Community-Based Organisations (CBO), Faith-Based Organisations (FBO) and Roll Back Malaria (RBM) partners, over 3.2 million LLINs were distributed throughout the country. This ensured at least one net per two persons, satisfying the definition of universal coverage by the World Health Organisation (WHO). Currently the ownership of LLINs is 86.6% (post campaign ownership and utilization survey, 2011).The percentage of children under five that slept under LLINs the previous night before the survey increased from 5% (MICS, 2005) to 26% (DHS,2008) and further increased to 73% (post campaign ownership and utilization survey, 201). The percentage of pregnant women that slept under LLINs the night before the survey increased from 10% (MICS, 2005) to 27% (DHS, 2008) and then to 77% (post campaign ownership and utilization survey, 2011).

Figure 32: Probability of Occurrence for this Mosquito Species.



Source:

Red indicates where our model predicts that the probability of finding the mosquito species is high and blue areas are where the model predicts that the probability of finding the species is low. Regional versions of this map also display species occurrence data as reported in the published literature (the black dots).

These predictions were generated using the Boosted Regression Tree modelling methodology which also produced a ranked list of environmental variables assessed to be influential in predicting the presence of this species. These environmental variables are given in the paper below.

Note: *The mosquito species occurrence data were collated with the aim of providing a global perspective, and the predictive maps we have produced are based on a model output across a large, regional scale. Whilst remaining informative, it is important to note that some individual country maps may not be able to represent all of the fine scale variation that exists in the mosquito distribution.*

4.7.4 Human Resources, Training and Capacity Development

See 4.1.5 and 4.3.4

4.7.5 Routine Information Systems

The Health Information System (HIS) in the Ministry of Health and Sanitation (MoHS) is the processes and mechanisms through which health-related data is produced and made accessible to users, through networking within and outside the Health Sector. The HIS has several sub-systems, each with specialized roles and responsibilities based on their comparative advantage. HIS sub-systems in Sierra Leone comprise of Health Management Information system (HMIS), Integrated Disease Surveillance and Response (IDSR), Vital Registration (VR) for births and deaths, Human Resource Information System (HRIS), Logistics Management Information System, Population-Based Information Systems, and Research-generated health information.

Reporting of the Health Management Information System (HMIS):

Following data collection, entry and analysis, the information derived from the data are interpreted and summarized into quarterly and annual reports which the NMCP shares with RBM partners. The NMCP shares the reports with RBM stakeholders during the quarterly RBM stakeholdersô meetings and yearly ministry of health review meetings. The reports are also used to give feedback to the NMCP, District health management Teams (DHMT) and or Malaria Focal Persons and health workers on their performance with regard to malaria activities. Often this report/feedback is given by way of on-the-job training during supervision visits to the health facilities and/or communities with the desired outcome to improve service provision and utilization.

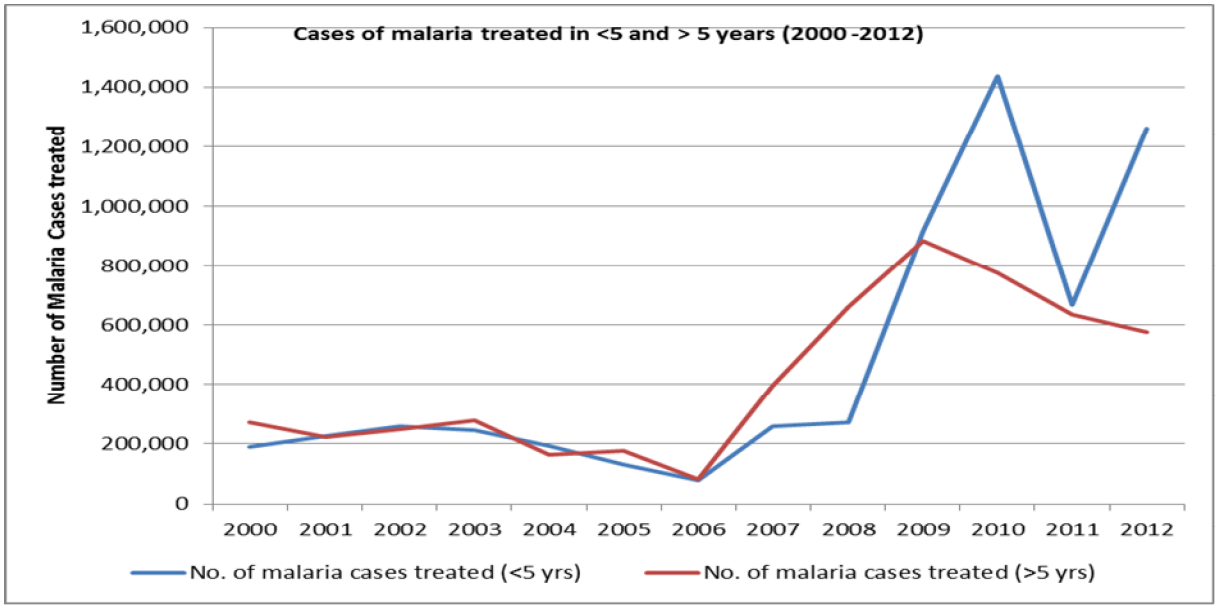
Global Fund specific technical reports are submitted to the Global Fund for Aids, Tuberculosis and Malaria (GFATM) Principle Recipient(s) (PR) who then share it with the Country Coordinating Mechanism (CCM) for their information and action. Other avenues for report sharing are annual sub regional meetings of the West Africa Regional Network (WARN). Reports from evaluation and research activities such as treatment efficacy studies and pharmacovigilance will be published in relevant peer review journals.

4.7.6 Sentinel Surveillance System

The NMCP/MoHS has sentinel surveillance system conducted at 8 sites of IRS piloted districts (Bo, Bombali, Kono and Western Area Rural districts). These sites are strategic for continuation of IRS activities. In 2002/2003, Therapeutic Efficacy Test for AS+AQ and SP was conducted at 4 sentinel sites. The MOHS has Health Management Information System (HMIS) software and HMIS tools used for data collection, analysis and reporting on various diseases including malaria nationwide. During the MPR period, the HMIS software was faced with series of challenges. Some districts are using the system for reporting whilst the other could not due to malfunctioning of the DHIS2. However, routine malaria data from health facilities are compiled on monthly basis by District Malaria Focal Points (MFP) and forwarded to NMCP for further analysis and reporting to MOHS and partners.

4.7.7 Monitoring and Evaluation Plan

Figure 33: Cases of malaria treatment in children under five years (2000-2012)



Source: NMCP Database

In support of the National Health Sector Strategic Plan 2010-2015, NMCP has an M & E Plan 2011-2015 for monitoring, supervision and evaluation of the strategic plan for Malaria Control Programme (2011-2015).

Staffing at National and district levels is inadequate as there is need for Data Manager and Information Technology (IT) Officer at NMCP and additional MFPs at district level (at least 2 MFPs per district). The M & E Unit is constrained with irregular disbursement of funds for quarterly supportive supervision, data analysis and timely reporting to MOHS/partners. Lack of regular disbursement of funds to DHMTs including fuel and bike maintenance for MFPs contributes to low supervision coverage. Support to PHUs for outreach services/supervision of Community Health Workers is very crucial for the success of the malaria control programme implementation. Moreover, adequate budget allocation should be provided as performance based incentives for the Community Health Workers for timely reporting to PHUs and replenishment of stock to prevent frequent stock out at community level and to ensure retention.

4.7.8 Malaria Surveys

The most recent Sierra Leone Malaria Indicator Survey (SLMIS) was conducted in 2013. Prior to this, SLMIS was conducted in 2010. Sierra Leone LLIN Universal Access Campaign Post-Campaign, Ownership and Use Survey were done in June 2011.The first malaria indicator survey was conducted in 2005. Other vital surveys were conducted as follows: SLMICS 2005, MICS4 2010, DHS 2008, Service Availability and Readiness 2010, Sierra Leone Malaria Knowledge, Attitudes and Practices (KAP) Study, August 2012. The results of these surveys are being used for informed decision making.

Table 30: Key indicators of the National Malaria Control Programme

No	Impact And Outcome Indicators	Baseline	Year/ Source	DHS 2008	MIS 2010	MICS 2010	HMIS 2012	MIS 2013	Target
1	All-cause under-5 mortality rate in highly endemic areas (MAL-I1)	286/1000	MICS 2005	190/1000		217/1000			2% Reduction/ year from the baseline
2	Percentage of slides or rapid diagnostic tests found positive among all slides and Rapid Diagnostic Tests (RDTs) [MAL-I6]	N/A					63%		50%
3	Parasite prevalence: children aged 6 - 59 months with malaria infection (detection of parasitemia by microscopy) (percentage) (MAL-I3)	65%	WHO 2000					43%	30%
4	Percentage of children under 5 with confirmed malaria in the last two weeks who received ACT within 24 hours of onset of fever at the community level [MALT7]	N/A							80%
5	Percentage of children under 5 with confirmed malaria in the last two weeks who received ACT within 24 hours of onset of fever at the facility level [MALT7]	N/A					75.9%		80%
6	Percentage of children U5 who slept under a Long Lasting Insecticidal Net (LLIN) the previous night (MAL-P5)	5%	MICS 2005	25.9%	44.0%	30.0%		69.2%	80%
7	Percentage of pregnant women who slept under a Long Lasting Insecticidal Net (LLIN) the previous night (MAL-P9)	12%	MIS 2005	27.7%	47.0%	28.0%		75.9%	80%
8	Percentage of households with at least one LLINs	15%	MIS 2005	39.5%	33.0%	36.0%		61.5%	80%
9	Percentage of households with at least two LLINs	35.8%	MIS 2013					35.8%	80%
10	Percentage of women who received two or more doses of Intermittent preventive treatment (IPT) for malaria during their last pregnancy (in last 2 years) [MAL-P10]	2%	MICS 2005	11.8%	72.3%	41.0%	88.4%	61.7%	80%
11	Percentage of children with fever in last 2 weeks	51%	MIS 2005		57.0%			33.4%	80%
No	**Impact And Outcome Indicators**	**Baseline**	**Year/ Source**	**DHS 2008**	**MIS 2010**	**MICS 2010**	**HMIS 2012**	**MIS 2013**	**Target**
12	Among children with fever Percentage who took antimalarial drugs same/next day	48%	MIS 2005	15.1%	46.0%	50.0%		37.4%	80%
13	Among children with fever Percentage who sought	22%	MIS 2005		26.0%			62.5%	80%

	treatment from a health facility/provider same/next day								
14	Percentage of children with fever whose first action was to go to a health facility	22%	MIS 2005		68.0%			74.0%	80%
15	Among children under five years of age with fever in the two weeks preceding the survey, percentage who took Artesunate+Amodiaquine	0%	2005 MIS		66.0%			31.6%	80%

4.7.9 Malaria Reporting

The MOHS does malaria reporting through the Health Management Information System (HMIS). Reporting from community to health facilities, health facilities to districts and from districts to NMCP are done on monthly basis. Districts malaria reports received at NMCP are analysed through the customised DHIS software and reported to MOHS and partners on quarterly and annual basis.

Reports of national reviews and planning meetings are also available: Malaria annual review meeting 2010, Malaria annual review meeting 2011 and Malaria Annual review meeting-2012.

4.7.10 Malaria database and informatics System

There is district DHIS software in place though not functional in all districts at the time of the review. There is inadequate informatics support to districts and national (computers, software, e-mail and internet network for districts and national).

4.7.11 Successes, best practices and facilitating factors

Successes

- Functional IDSR, HMIS (DHIS 2), LMIS. DHIS 2 has customised malaria module
- An integrated supervisory checklist exists and supervision is working, although irregular
- DHMT submit regular monthly reports to NMCP. Also, annual review and planning meetings take place and annual reports are prepared and shared
- Availability of integrated reporting tools at all levels (except in the NGO facilities and hospitals)
- All PHUs have phones which are used for reporting data and events
- Considerable work on data collection at DHMT and PHU and lower levels
- Disease Surveillance Officers, M & E Officer and Malaria Focal Points are in all districts
- There is existence of M & E Structure at all levels
- Improved HR capacity (M & E Officers at national and district levels, Data Entry Clerks at district and national level, Malaria Focal Points at district level)
- Availability of the National M & E Plan 2011-2015 (in line with national M & E Plan 2011-2015)
- Availability of the data management procedure manual (SoP)
- Availability and use of national guidelines and on malaria interventions at national and district levels
- The program has benefited /conducted several surveys and data is available
- Improved collaboration between MoHS/DHMTs/Programs and partners (RBM partnership)
- Improved data quality (Completeness of reports, timeliness of reporting, consistency)
- Consistently conducted Therapeutic Efficacy Test (TET) and used results for policy formation

Best practices

- Management of data through HMIS
- Use of integrated supervisory checklist for supportive supervision at all levels
- Sharing of program information through monthly RBM meetings at NMCP
- Feedback to districts/PHUs during DHMT/ In-charges meetings at district level
- Tracking district reports at national level for completeness, correctness and consistencies in reporting
- Integration of data quality assessment in supportive supervision of health facilities
- Prioritise health facilities for supervision based on data quality issues (district data is cross-checked to identify health facilities with suspicious data for follow- up visits during supervision

Facilitating factors

The following factors are contributing to the above achievements:

- MOHS has trained health staff at national, districts and in all health facilities
- Commitment of staff to program activities
- Collaboration with partners support to various areas of intervention
- MOHS and donor supports to program activities

4.7.13 Issues and challenges

- Vertical reporting by other players in malaria intervention
- Lack of backup system for electronic program data
- Lack of district malaria profile for localized action
- There is research agenda and there is limited local research capacity for use by NMCP
- There are grey areas in the area of the oversight role of DHMT over NGO health facility
- Uncoordinated (and irregular) supervision, monitoring and evaluation of planned activities (by all stakeholders) due to low funding
- Late disbursement of funds for maintenance of vehicles for supervision at all levels
- Weak collaboration between DHMT and hospital management
- Low human resource capacity at all levels
- Attrition of health workers at all levels
- High turnover of malaria focal persons at DHMTs
- DHS2 not working in some districts compromises workers who have had to resort to manual system of compilation and analysis
- Poor data collection and documentation at hospital level coupled with lack of qualified information personnel at the hospital level
- Inadequate malaria epidemiological data at district and national levels for action
- Inadequate data analysis and use at all levels (including inadequate capacity)

4.7.14 Conclusion and Recommendations

- Å NMCP should strengthen the logistics support to supervision of hospitals and the supervision of PHUs by DHMTs
- Å The M & E team to review the processes for improved data collection, collation, analysis (including mapping) and use at all levels
- Å Regular maintenance of DHIS2 , and need to have several training of staff on DHIS2 to ensure it continuity
- Å Strengthen the staffing capacity for health information at hospital level
- Å Government of Sierra Leone should increase the human resource capacity at all levels of the health system
- Å Develop and share the Malaria Research Agenda

Ky recommendations

Malaria Programme Management and leadership

1. Increase and sustain government counterpart funding
2. Include and prioritize malaria control activities in the Local Council Health Plans and hospital plans
3. Ensure the functioning of the RBM oversight committee and technical working groups
4. Review the district coordination arrangement or structure for improved performance
5. Strengthen the capacity of the District and Sub-district teams to coordinate RBM activities so as to ensure effective management, supervision and monitoring of service delivery in the region using opportunity of Leadership Development Programme
6. Take steps to improve partnership with the private sector and the Teaching Hospitals
7. Improve integrated supportive supervision to include malaria activities from National to district level and from district to the PHU level.
8. NMCP should widely disseminate any revision of policies and guidelines in malaria especially to the clinical health staff.
9. Include malaria in the package for pre ï service training institutions and support them as required

Procurement Supply and Management

1. Update out-dated policies and guidelines, and institute compliance monitoring.
2. Strengthen mechanisms for coordination of partners.
3. Integration of NMCP procurement processes with CMS/NPPU.
4. Build new and renovate storage facilities at national and district levels.
5. Strengthen QA/QC system including field supervision and linkage with External QA programme.
6. Strengthen LMIS for effective monitoring of service and quantification of commodities.

Integrated Vector Management

1. Review/update relevant policies & guidelines on LLIN and IRS
2. Strengthen coordination of donor and implementing partners
3. Strengthen participation & commitment of NGOs, FBOs, and private organizations in malaria vector control
4. Sustain and scale-up IRS in targeted districts
5. Develop routine LLINs distribution system
6. Establish and fund entomological and insecticide resistance monitoring

Case Management (Malaria Diagnosis and Treatment)

1. Ensure compliance with policies and guidelines.
2. Build human resource capacity and infrastructure for QA/QC system for Malaria diagnosis and treatment.
3. Supply RDT for community case management of Malaria.
4. Strengthen and conduct regular supervision, particularly of CHWs.
5. Improve pharmacovigilance of anti-malaria medicines.

Malaria in Pregnancy

1. Review and update of MIP policy and guidelines.
2. Establish MIP technical subcommittee within the RBM Taskforce.
3. Develop and implement resource mobilisation plan for MIP.
4. Engage and integrate the private sector institutions into MIP.
5. Conduct an operational research on the effect of SP and pregnancy outcome
6. Conduct SP pharmacovigilance and efficacy monitoring.
7. Strengthen monitoring and supervision of MIP activities at all levels.

Advocacy, Communication and Social Mobilization (ACSM)

1. Mobilize resources for IEC/BCC activities
2. Improve coordination and engagement of potential partners
3. Ensure quality of delivery of interventions and periodic evaluation including barrier analysis.
4. Scale-up capacity building at all levels
5. Intensify advocacy & BCC campaigns at all levels
6. Review/update relevant policies and guidelines including review of IEC/BCC indicators and targets to incorporate behavioural objectives

Surveillance, Monitoring and Evaluation and Operational Research

NMCP should strengthen the logistics support to supervision of hospitals and the supervision of PHUs by DHMTs

ÅThe M&E team should review the key processes to standardize analysis (including mapping) and use of collected and collated data at district level.

ÅTo ensure consistent functionality of the DHIS the MOHS should ensure that the system is maintained by several people to ensure continuity of the system in the public interest.

ÅStrengthen the staffing capacity for health information at hospital levels
ÅGOSL should increase the HR capacity at all levels of the health system
ÅDevelop and share the malaria research agenda
ÅThe MOHS should strengthen the oversight role of DHMTS over NGOs working under their jurisdiction to ensure their compliance to set rules and functioning as public health facilities.

Annexes

Annex 1: Agenda for all the phases of the MPR

Phase 2 of the MPR

AGENDA – THEMATIC DESK REVIEW

DATE	TIME	ACTIVITY	RESPONSIBLE PERSON (S)
DAY 1 10/09/2013	8:30am-9:00am	Registration of Participants	NMCP
	9:00am-9:15am	Prayers and self introduction of participants	All
	9:15am-9:20am	Objective of workshop	NMCP
	9:20am-10:00am	Overview of MPR	Programme Manager-NMCP
	10:00am-10:30am	TEA BREAK	
	10:30am-11:15am	Background of MPR	NMCP
	11:15am-11:30am	Formation of groups and TOR for thematic areas and sets of required documents to be reviewed.	
	11:30am-11:40am	Assemble information/document by thematic areas	
	11:40am-1:30pm	Group work ï reviewing of documents	
	1:30pm-2:30pm	LUNCH BREAK	
	2:30pm-4:30pm	Group work continues	
Day 2 11/09/2013	8:30am-9:00am	Registration of Participants	NMCP
	9:00am-10:30am	Group presentation and discussions (*10mins presentations and 5 mins discussion)*	ALL
	10:30am-11:00am	TEA BREAK	NMCP
	11:00am-1:00pm	Group work continues	ALL
	1:00pm-2:00pm	LUNCH BREAK	NMCP
	2:00pm-4:00pm	Group work continues	ALL
Day 3 12/09/2013	8:30am-9:00am	Registration of Participants	NMCP
	9:00am-10:30am	Group work continues	ALL
	10:30am-11:00am	TEA BREAK	NMCP
	11:00am-1:00pm	Group work continues	ALL
	1:00pm-2:00pm	LUNCH BREAK	NMCP
	2:00pm-4:00pm	Group work continues	ALL
Day 4 13/09/2013	8:30am-9:00am	Registration of Participants	NMCP
	9:00am-10:30am	Group work continues	ALL
	10:30am-11:00am	TEA BREAK	NMCP
	11:00am-1:00pm	Group work continues	ALL
	1:00pm-2:00pm	LUNCH BREAK	NMCP
	2:00pm-4:00pm	Group work continues	ALL
Day 5 14/09/2013	8:30am-9:00am	Registration of Participants	NMCP
	9:00am-10:00am	Group presentations and discussions (*15mins presentation and 5 mins discussion)*	ALL
	10:00am-10:30am	TEA BREAK	NMCP
	10:30am-12:00pm	Group presentations and discussions (*15mins presentation and 5 mins discussion)*	ALL
	12:00pm-1:00pm	LUNCH BREAK	NMCP
	1:00p,-1:30pm	Closing and next steps	NMCP

PHASE 2: Workshop Agenda: COMPILATION OF THE THEMATIC DESK REVIEW REPORTS

DATE	**TIME**	**ACTIVITY**	**RESPONSIBLE PERSON(S)**
Day 1	8:30a.m-9:00a.m	Registration of Participants	NMCP SEC.
17/09/2013	9:00a.m-10:00a.m.	Group work continues on the thematic areas	ALL
	10:00a.m-10:30a.m.	**TEA BREAK**	
	10:30a.m-1:00pm	Group work continues on the thematic areas	ALL
	1:00 ï 2:00	**LUNCH BREAK**	NMCP SEC
	2:00p.m-4:00p.m	Group work continues	ALL
DATE	**TIME**	**ACTIVITY**	**RESPONSIBLE PERSON(S)**
Day 2	8:30a.m-9:00a.m	Registration of Participants	NMCP SEC.
18/09/2013	9:00a.m-10:00a.m.	Group work continues on the thematic areas	ALL
	10:00a.m-10:30a.m.	**TEA BREAK**	
	10:30a.m-1:00pm	Group work continues on the thematic areas	ALL
	1:00 ï 2:00	**LUNCH BREAK**	NMCP SEC
	2:00p.m-4:00p.m	Group work continues	ALL
DATE	**TIME**	**ACTIVITY**	**RESPONSIBLE PERSON(S)**
Day 3	8:30a.m-9:00a.m	Registration of Participants	NMCP SEC.
19/09/2013	9:00a.m-10:00a.m.	Group work continues on the thematic areas	ALL
	10:00a.m-10:30a.m.	**TEA BREAK**	
	10:30a.m-1:00pm	Group work continues on the thematic areas	ALL
	1:00 ï 2:00	**LUNCH BREAK**	NMCP SEC
	2:00p.m-4:00p.m	Group work continues	ALL
DATE	**TIME**	**ACTIVITY**	**RESPONSIBLE PERSON(S)**
Day 4	8:30a.m-9:00a.m	Registration of Participants	NMCP SEC.
20/09/2013	9:00a.m-10:00a.m.	Group work continues on the thematic areas	ALL
	10:00a.m-10:30a.m.	**TEA BREAK**	
	10:30a.m-1:00pm	Group work continues on the thematic areas	ALL
	1:00 ï 2:00	**LUNCH BREAK**	NMCP SEC
	2:00p.m-4:00p.m	Group work continues	ALL
DATE	**TIME**	**ACTIVITY**	**RESPONSIBLE PERSON(S)**
Day 5	8:30a.m-9:00a.m	Registration of Participants	NMCP SEC.
21/09/2013	9:00a.m-10:00a.m.	Group work continues on the thematic areas	ALL
	10:00a.m-10:30a.m.	**TEA BREAK**	
	10:30a.m-12:00pm	Group work continues on the thematic areas	ALL
	12:00-2:00	Group discussions and next steps	ALL
	2:00-3:00	**LUNCH BREAK**	
	3:00 ï 5:00	Group work continues on the thematic areas	All

PHASE 3 OF THE MPR

JOINT WHO TECHNICAL SUPPORT FOR THE PHASE 3 OF THE MPR IN SIERRA LEONE
30 September to 12 October 2013

PROVISIONAL AGENDA

DATE/ TIME	ACTIVITY	RESPONSIBLE	OBSERVATION
MONDAY 30 SEPTEMBER 2013			
08:30 ï 10:00	Briefing with the WR ï Sierra Leone Briefing with the MOH		
11:00 ï 17:00	Briefing with the NMCP Working session on preparation of the Review of the entry meeting: Thematic desk review report		
TUESDAY 01 OCTOBER 2013			
08:30 ï 17:00	Entry meeting for local consultants, technical working group, Secretariat of the MPR and WHO technical team,		Power point presentation
	Consensus building on findings of thematic internal desk review		
WEDNESDAY 02 OCTOBER 2013			
08:30 ï 17:00	Review/validation of the Thematic desk review report Stakeholders meeting for Familiarization with data collection tools for field visits		Data collection tools
THURSDAY 03 OCTOBER 2013			
	Data collection at Central level to national institutions and organizations Regional, district and community field visits to malaria service delivery points		Central level tools & Regional and district levels tools
FRIDAY 04 OCTOBER 2013			
08:30 ï 17:00	Data collection at Central level to national institutions and organizations		Central level tools
	Regional, district and community field visits to malaria service delivery points		Regional and district levels tools
SATURDAY 05 OCTOBER 2013			
08:30 ï 17:00	Regional, district and community field visits to malaria service delivery points		District and community level tools
MONDAY 07 OCTOBER 2013			
08:30 ï 17:00	Field visit report	All teams	Report outline
TUESDAY 08 OCTOBER 2013			
08:30 ï 17:00	Sharing of reports and presentations from field review and consensus on key findings		Power point presentations

			(Report)
WEDNESDAY 09 OCTOBER 2013			
08:30 ï 17:00	Preparation of executive summary, aide-memoire and slide presentation of key findings and recommendations	Sharing of reports and presentations from field review and consensus on key findings	Aide memoire Power point presentation
THURSDAY 10 OCTOBER 2013			
08:30 ï 13:00	Presentation of review findings and recommendations and Aide - Memoire to the TWG	Sharing of reports and presentations from field review and consensus on key findings	
15:00 ï 17:00	Aide memoire signature		
FRIDAY11 OCTOBER 2013			
08:30 ï 17:00	Development of zero draft MPR report		Report outline
SATURDAY 12 OCTOBER 2013			
08:30 ï 17:00	Development of zero draft MPR report		Report outline
SUNDAY 13 OCTBER 2013			
08:30 ï 17:00	Departure of the External Reviewers		

Annex 2: People involved in MPR

NO.	NAME	TITLE	ORGANISATION
NATIONAL MALARIA CONTROL PROGRAMME (NMCP)			
1	Samuel J. Smith	Programme Manager	NMCP
2	Hassan Bangura	Senior Project Accountant, GF /Malaria/TB Grant	NMCP
3	Michael Gray	Finance Officer	NMCP
4	Anitta Kamara	Case Management Focal Point	NMCP
5	Wani K. Lahai	IEC/BCC Focal Point	NMCP
6	Ngadie Lombi	Partnership focal Point	NMCP
7	Musa Silla-Kanu	M&E Officer	NMCP
8	Frederick Yamba	M&E Officer	NMCP
9	Thomas Ansumana	M&E Officer	NMCP
10	Nelson Fofana	Data Entry Clerk	NMCP
11	Philip Brewa	Data Entry Clerk	NMCP
12	Magdalene Nze Daniel	Data Entry Clerk	NMCP
13	Mohamed Juana	IRS focal Point	NMCP
14	Solomon T. K. Johnson	LLINs focal Point	NMCP
15	Marie I. Kamara	Programme Pharmacist	NMCP
UN AGENCIES			
1	Ngozi Kennedy	Health Specialist	UNICEF
2	Jackson-Sillah	Technical Assistant	WHO
3	Louisa Ganda	DPC	WHO
4	Chengetanai Mangoro	PSM Expert	UNICEF/NMCP
MINISTRY OF HEALTH OFFICIALS			
1	Miatta Kargbo	Minister of Health	MOHS
2	AbuBakarr Fofanah	Dep. Minister of Health 1	MOHS
3	Foday Sawi	Dep. Minister of Health 11	MOHS

4	Brima Kargbo	Chief Medical Officer	MOHS
5	Sarian Kamara	Deputy Chief Medical Officer	MOHS
6	Amara Jambai	Director Disease Prevention and Control	MOHS
7	Donald Bash-Taqi	Director Hospital and Laboratories	MOHS
8	SNK Lansana	Director Internal Auditor	MOHS
9	Sorie Kamara	Director Financial Resource	MOHS
10	Prof. Gevao	Director National Laboratory Services	MOHS
11	Bassie Turay	Director Drugs and Medical Supplies	MOHS
12	Isatta Wurie	Coordinator Central Public Health Reference Laboratory	CPHRL
13	Fodie J. Konneh	Director Procurement Unit	MOHS
14	Hosianatu Kanu	Chief Nursing Officer	MOHS
15	Thomas Conteh	Pharmacist, Pharmacy Board of Sierra Leone	MOHS
16	Mohamed Kamara	LMIS officer, CMS	MOHS
17	Musu Fanta Amara	Public Health Sister, HED	MOHS
18	Alpha S. Swaray	Head, Connaught Referral Laboratory	MOHS
19	Doris Harding	Deputy Laboratory Manager/Head, Central Public Health Reference Laboratory Services.	MOHS
20	Sonia Makaye	Laboratory Technician	MOHS
21	Denise Thomas	Dep. Director Medical Stores, CMS	MOHS
22	Micheal Lahai	Pharmacist, QC lab/PBSL	MOHS
23	Edward MCewen	M&E Officer, DPI	MOHS
24	Sally Carew	Public Health Sister, Reproductive Health	MOHS
25	Mabinty Tarawallie	IMNCI focal Point	MOHS
PRINCIPAL RECIPIENT GF R10			
1	Abu K. Kamara	PR Coordinator GF R10, Malaria/TB grant	MOHS
2	Claudia Shilumani	Project Director, GF R10, Malaria	CRS
3	Nancy Mansaray	BCC Coordinator, GF R10 Malaria	CRS

4	Bockarie Sesay	M&E Officer	CRS
RBM PARTNERS			
1	Phileas Jusu	Director, Communications	UMC
2	Roselyn John	Receptionist	TBFF
3	Regena Kain	Malaria Programme Coordinator	BRAC
4	Daniel Sowa	Programme officer	HFAC
5	Paul Gibson	Paediatrician	OLDH
6	Lynette Palmer	Family Physician	Blue Shield. Curney Barnes
7	Amara Bahun	Project Officer, Global Fund Round 10, Pikin to Pikin Movement	
8	Laura Miller	ICCM Coordinator	IRC
9	Augustine Demby	Assistant Programme Officer	Save the Children
10	Edward Dumbuya	Director	FHADA
11	Musa Sesay	Programme Officer	CF
12	Abdul Sankoh	Programme Director	CAWeC
13	Nancy Mansaray	BCC Coordinator, GF R10 Malaria	CRS
14	Bockarie Sesay	M&E Officer	CRS
15	Alieu Bangura	Programme Director	WV SL
16	Ibrahim Kamara	Health Advisor	Plan SL
17	Claire Baden	Programme Officer	SC
18	Laura Hastings		Concern Worldwide
19	Mamoud Sesay		MIRAL Phamaceuticals
SUB-RECIPIENT FOR GF R10			
1	Sallieu M. Kargbo	Field Supervisor	CAWeC
2	Abdul B. Sankoh	Director	CAWeC
3	Edward Dumbuya	Director	FHADA

DISTRICT HEALTH MANAGEMENT TEAMS			
1	Joseph N. Kandeh	District Medical Officer	WA
2	Christian Massallay	District Health Sister	WA
3	William T. Pessima	Malaria Focal Point	WA
4	Adikali Kamara	District Medical Officer	Port Loko
5	Jonathan Ellie	Malaria Focal Pont	Port Loko
6	Mohamed Kamara	M&E Officer	Port Loko
7	Yakuba M. Bah	District Medical officer	Bombali
8	Hamid Kamara	Malaria Focal Point	Bombali
9	Charlse Kanu	Malaria Focal Point	Bombali
10	Mohamed Vandy	District Medical Officer	Pujehun
11	Hawa Kallon	District Health Sister	Pujehun
12	Foday Brima	Malaria Focal Point	Pujehun
13	Alhaji S. Turay	District Medical Officer	Bo
14	Bairu Kanu	Malaria Focal Point	Bo
15	Fatmata Sheriff	Malaria Focal Point	Bo
16	Thomas T. Samba	District Medical Officer	Kenema
17	Janet Hindowa	Malaria Focal Point	Kenema
18	Ibrahim T. Kawa	M&E Officer	Kenema
LOCAL /NATIONAL CONSULTANTS			
1	Kristin Banek	National Consultant	
2	Prince Albert T. Roberts	National Consultant	
EXTERNAL CONSULTANTS			
1	Khoti Gausi	WHO/IST	ESA
2	Moses Jeuronlon	WHO	Liberia
3	Oluseye Babatunde	WHO	Nigeria
4	Stephan Abel Tohon	WHO/IST	WA

Annex 3: Thematic review teams

CASE MANAGEMENT TEAM

1. Anitta KAMARA	-	Case Management Focal Person, NMCP
2. Lynette PALMER	-	Consulting Family Physician, Blue Shield/ Curney Barnes Hospital
3. J.N. KANDEH	-	DMO Western Area
4. Alpha S. SWARAY	-	Head, Connaught Referral Laboratory/
5. Doris HARDING	-	Deputy Laboratory Manager/Head, Central Public Health Reference Laboratory. Services
6. Pharm. Thomas A. CONTEH	-	Pharmacovigilance Department, Pharmacy Board of Sierra Leone
7. Ngozi KENNEDY	-	Health Specialist, UNICEF
8. Paul GIBSON	-	Paediatrician, Ola During Childrenôsô Hospital
9. Amara BAHUN	-	Project Officer, Global Fund Round 10, Pikin to Pikin Movement
10. Laura MILLER	-	ICCM Coordinator, IRC
11. William T. PESSIMA	-	Malaria Focal Point, DHMT, Western Area
12. Augustine A. DEMBY	-	Assistant Programme Officer, Save The Children, Pujehun
13. Mabinty TARAWALLIE	-	IMNCI Focal Point
14. Sonia MAKAYE	-	Laboratory Technician, Central Public Health Reference Laboratory.

MONITORING AND EVALUATION TEAM

1. Musa SILLAH-KANU	-	M&E Officer	-	NMCP
2. Frederick YAMBA	-	M&E Officer	-	NMCP
3. Thomas ANSUMANA	-	M&E Officer	-	NMCP
4. Nelson FOFANA	-	DEC	-	NMCP
5. Philip BREWA	-	DEC	-	NMCP
6. Magdalene NZE DANIEL	-	DEC	-	NMCP
7. Edward McEWEN	-	M&E Officer	-	DPI
8. Bockarie SESAY	-	M&E Officer	-	CRS

MALARIA IN PREGNANCY TEAM

1. Wani K. LAHAI	-	IEC/BCC Focal Point	-	NMCP
2. Sally CAREW	-	Public Health Sister	-	Reproductive and Child Health
3. Christiana MASSALLY	-	District Health Sister	-	DHMT Western Area
4. Ngadi LOMBI	-	Partnership Focal Point	-	NMCP
5. Dr. A.P. Koroma	-	Specialist Gynaecologist/Obstetrician	-	PCMH

ADVOCACY, INFORMATION, EDUCATION, COMMUNICATION AND COMMUNITY MOBILIZATION TEAM

1.	Nancy MANSARAY	-	BCC Coordinator, GF R10 Malaria	-	CRS
2.	Claudia SHILUMANI	-	Project Director, GF R10, Malaria	-	CRS
3.	Phileas JUSU	-	Director, Communications	-	UMC
4.	Roselyn JOHN	-	Officer	-	TBFF
5.	Regena KAIN	-	Malaria Programme Coord.	-	CAWeC
6.	Sallieu M. KARGBO	-	Field Supervisor	-	CAWeC
7.	Abdul B. SANKOH	-	Director	-	CAWeC
8.	Ngadie LOMBI	-	Partnership Focal Point	-	NMCP
9.	Musu Fanta AMARA	-	Public Health Sister	-	HED
10.	Wani Kumba LAHAI	-	IEC/BCC Focal Point	-	NMCP

PROCUREMENT AND SUPPLY MANAGEMENT TEAM

1.	Marie I KAMARA	-	Pharmacist	-NMCP/MoHS
2.	Denis THOMAS	-	DDMS	-CMS/MoHS
3.	Mohamed KAMARA	-	LMIS officer	-CMS/MoHS
4.	Chengetanai MANGORO	-	PSM Expert	- UNICEF/NMCP
5.	Daniel SOWA	-	Officer	- HFAC
6.	Michael LAHAI	-	Pharmacist	- QC lab/PBSL

PROGRAMME MANAGEMENT TEAM

1.	SNK. Lansana	-	Director of Internal Audit	-	MoHS
2.	Sorie Kamara	-	Director of Financial Resource-		MoHS
3.	Fodi J. Konneh	-	PM, Procurement Division	-	MoHS
4.	Abu Kamara	-	PR Coordinator	-	GF, TB Malaria Grant
5.	Hassan Bangura	-	Senior Project Accountant	-	GF, TB Malaria Grant
6.	Samuel J. Smith	-	Programme Manager	-	NMCP
7.	John Seppeh	-	M&E Officer	-	NMCP
8.	Michael Gray	-	Finance Officer	-	NMCP

Annex 4: Field teams

PUJEHUN FIELD TEAM

1. Anitta KAMARA ï NMCP
2. Magdalene NZE-DANIELS ï NMCP
3. Bockarie SESAY ï CRS
4. Thomas A. CONTEH ï PHARMACY BOARD
5. Foday BRIMA - DHMT
6. Hawa KALLON - DHMT
7. Baba KANU ï DRIVER

BO FIELD FIELD TEAM

1. Frederick Yamba - NMCP
2. Wani Kumba Lahai - NMCP
3. Nelson Fofanah - NMCP
4. Bairu Khanu- DHMT Bo
5. Fatmata Sheriff ï DHMT, Bo
6. Khoti Gausi - M&E, WHO
7. Eric, WHO

BOMBALI FIELD TEAM

1. Mohamed Juana - NMCP
2. Philip Brewa - NMCP
3. Jusu Phileas - UMC
4. Hamid Kamara - District Malaria Focal Person
5. Zainab Conteh - M&E Officer, Bombali
6. Moses Jeuronlon - M&E WHO
7. Abdul Kanu - NMCP

PORT LOKO FIELD TEAM

1. John Seppeh - NMCP
2. Thomas Ansumana - NMCP
3. Jonathan Ellie ï District Malaria Focal Person
4. Dr. Oluseye Babatunde - WHO
5. Mohammed Kamara - M&E Officer, Port Loko
6. Doris Maturi ï Plan SL
7. Mohamed Sesay - NMCP

KENEMA FIELD TEAM

1.	Musa Sillah-Kanu	-	NMCP
2.	Ngadi Lombi	-	NMCP
3.	Marie Kamara	-	NMCP
4.	Daniel Sowa	-	Health For All Coalition
5.	Janet Hindowa	-	District Malaria Focal Person
6.	Ibrahim T. Kawa	-	M&E Officer, Kenema
7.	Tommy Sesay	-	NMCP

WESTERN AREA FIELD TEAM

1.	Samuel J. Smith	-	NMCP
2.	Solomon T.K. Johnson	-	NMCP
3.	Doris Harding	-	Central Referral Laboratory
4.	Musu Fanta Amara	-	Health Education Division
5.	Hassan Bangura	-	Senior Project Accountant
6.	Micheal Gray	-	NMCP
7.	William Pessima	-	District Malaria Focal Person
8.	Festus Pessima	-	M&E Officer
9.	Jackson-Sillah	-	WHO, country office
10.	Stephan Tohon	-	IST, WHO
11.	Abu Sesay	-	NMCP

Annex 5: People visited

CENTRAL TEAM

The areas visited and assessed were;

- The Ministry of Healthôs Head quarters.
- The central medical stores
- The partners;
  - Health for all coalition;
  - UMC;
  - Plan Sierra Leone;
  - Save the children;
  - CRS;
  - World vision Sierra Leone;
  - UNICEF;
  - Child Fund;
- Hospitals (Teaching)
  - PCMH and Connaught,
- Community Health Facilities
- Malaria Programme Office

Individuals interviewed

- Å The Minister of Health and sanitation
- Å Chief Medical Officer
- Å Deputy Chief Medical Officer
- Å Permanent Secretary and Other Directors
- Å Deputy Permanent secretary
- District Medical Officer and DHMT members (Western Area)
- Teaching Hospital
- Community Health Officer
- NGOs (UMC)

PUJEHUN DISTRICT

Areas visited

1. Outpatient Department
2. IPD (Adults and Paed.)
3. District Pharmacy
4. Hospital Pharmacy
5. ANC
6. District Pharmacy
7. District Medical Store
8. Laboratory
9. Maternity Ward
10. Gbondapi Health centre
11. Bayama Health Centre

INDIVIDUALS INTERVEIWED

1. District Medical Officer
2. Community Health Officer
3. District Pharmacist
4. Hospital Pharmacist
5. M&E Officer
6. District Health Sister
7. Malaria Focal Point
8. In-charge ANC
9. District Store keeper
10. Laboratory superintendent
11. PHU in-charge
12. In charge, Paediatric ward
13. Nurse in Training
14. Community leaders
    - VDC Chairman
    - Town Chief
    - Vice chairman, VDC

BOMBALI DISTRICT

Areas visited

1. DHMT
2. Bombali Regional Hospital
3. Holy Spirit (Catholic) Hospital
4. Binkolo Community Health Centre
5. Masongbo Community Health Centre
6. Binkolo Town for community group discussion

INDIVIDUALS INTERVEIWED

1. DMO
2. Malaria Focal Persons and the Finance Officer.
3. Bombali Regional Hospital: Medical, Pharmacy, Lab.
4. Holy Spirit (Catholic) Hospital: Matron, Peds., Pharm., Lab.
5. Binkolo and Masongbo Community Health Centres: Officers in Charge, MCH Nurse.
6. Community group discussion in Binkolo Town.
7. Cross section of community members
8. Secretary (male) and a member (female) of the health development committee.
9. Teachers (M), Farmers (F), Mothers, and Youths (M).

BO DISTRICT

Areas visited

1. District Health Management Team Bo
2. Bo Government Hospital
   --Maternity ward
   -OPD
   -Paediatric ward
   -Laboratory
   -Pharmacy
   -MCH Static
3. Koribondor CHC
4. Gandorhun Community (FGD) (jaiama Bongor chiefdom)
5. Gondama Referral Center (MSF-B)

INDIVIDUALS INTERVIEWED

1. District Medical Officer
2. Medical superintendent
3. Medical Officer
4. Matron
5. Laboratory Superintendent
6. Community Health Officer
7. State Registered Nurse

8. State Enrolled Community health Nurse
9. Midwife
10. PHU in-charges
11. Community members

KENEMA DISTRICT

Areas visited

1. Hospital Management Team
2. Out-Patient Department
3. In-Patient Department (paediatric ward)
4. Maternity ward
5. Laboratory
6. Pharmacy
7. District Health Management Team (DHMT)
8. District Medical Stores
9. Antenatal Clinic
10. Health Centre
    - Blama CHC)
    - Kenema Government hospital
    - Gelehun community
    - Panguma Mission Hospital
    - Ngeihun MCHP
    - Ngeihun community

INDIVIDUALS INTERVEIWED

1. District Medical Officer
2. District Malaria focal person
3. Soc. Mob officer
4. District Pharmacist
5. Store Keeper
6. Hospital Secretary
7. Hospital Data Clerk
8. CHO In-Charge
9. State Enrolled Community Health Nurse
10. Registration Clerk
11. Director, Laboratory services
12. Pharmacy technician
13. Mid-Wife

PORT LOKO DISTRICT

Areas visited

1. Port Loko District Health Management Team;
2. Port Loko District Hospital
    - Maternity ward
    - In-patient
    - Out- patient

- Laboratory
- ANC
- Pharmacy

3. St. John of God Hospital
   - Hospital Management
   - Pharmacy
   - Out-patient
   - In-patient
   - Maternity
   - ANC
   - Laboratory
4. New Maforki CHP
5. Rogbere CHC

INDIVIDUALS INTERVIEWED

1. District Medical Officer
2. District Malaria Focal Point
3. Focus Group Discussion with cross section of community people who seek treatment from the health facility
4. Pharmacy Technician
5. Records Clerk
6. District store keeper
7. District Pharmacist
8. Community Health Officer
9. Community Health Worker
10. Midwife
11. State Registered Nurse
12. Hospital Secretary
13. State Enrolled Community Health Nurse

Reference:

1. Assessment of the Malaria Diagnosis System in Sierra Leone Report ,December 2012
2. Bockarie, M., A. Gbakima, et al. (1999). "It all began with Ronald Ross: 100 years of malaria research and control in Sierra Leone (1899-1999)." Annals of Tropical Medicine and Parasitology**93**(3): 213-224.
3. Basic Package of Essential Health Services for Sierra Leone, 2010
4. Community Health Worker Policy, 2012
5. de Souza, D. K., B. G. Koudou, et al. (2013). "Filling the Gap 115 Years after Ronald Ross: The Distribution of the Anopheles coluzzii and Anopheles gambiae ss from Freetown and Monrovia, West Africa." PLoS ONE**8**(5): e64939.
6. de Souza D, et al. Environmental factors associated with the distribution of *Anopheles gambiae s.s* in Ghana; an important vector of Lymphatic Filariasis and Malaria. PLos one 5: e9927
7. Draft CHW training manual (incl. flash cards)
8. Demographic and Health Survey Report, 2008
9. Guidelines for Case Management of Malaria in Sierra Leone, December 2010
10. Guide for the Implementation of Community Case Management of Malaria, February 2013
11. IPT training manual for facilitators, November 2005
12. ICON Safety sheet
13. IRS narrative report, 2011
14. IRS Technical Document, 2012
15. Joint Programme of Work and Funding, 2011
16. Joint Programme of Work and Funding (JPWF), 2012
17. Malaria Indicator Survey, 2013
18. Manual for teachers on the management of malaria in schools, YYYY
19. Malaria Programme Review Manual-2010
20. Multi Indicator Cluster Survey Report, 2005
21. Malaria Indicator Survey report, 2013
22. Malaria Free Sierra Leone for health clubs (school and community)
23. Manual for BRAC Community Health Promoters, 2008
24. National Health Sector Strategic Plan (2010-2015)

25. National Laboratory Manual for Malaria Diagnosis, December 2012

26. National Malaria Communication Strategy, 2012

27. National Health Policy,

28. National Primary Health Hand book

29. National Malaria Control strategic plan-2011

30. National Malaria Control Policy, 2010

31. National Health Education Policy, 2010

32. National Census 2004, Statistics Sierra Leone

33. National Malaria Control Program. National Roll Back Malaria Strategic plan, 2004-2008

34. National Malaria Control Program National Malaria Control Strategic Plan, 2011-2015

35. National Guidelines and Strategies for Malaria Prevention and Control during Pregnancy, November 2005

36. National Guidelines on Intermittent Preventive Treatment (IPT) of Malaria in Pregnancy in Sierra Leone, August 2005

37. National Strategic Plan for Malaria Control in Sierra Leone (2004-2008), March 2004

38. Net Treatment analysis report

39. Sierra Leone Malaria Control Strategic Plan (2011-2015), October 2010

40. Sierra Leone LLIN Universal Access Campaign Post- Ownership and use survey Report , June 2011

41. National Malaria Control Programme (NMCP) Sierra Leone, Statistics Sierra Leone, Catholic Relief Services, and ICF International. 2013. *Sierra Leone Malaria Indicator Survey*. Freetown, Sierra Leone: NMCP, SSL, CRS and ICF International.

42. Partners in Malaria, 2012Primary Health Workers Manual, December 2012

43. Policy for Community Health Workers in Sierra Leone, November 2011

44. PRSP 1, -2004-2007,

45. PRSP 2,-2008-2012

46. Result and Accountability Framework, 2011

47. Reproductive Health Policy, YYYY

48. Susceptibility Study, IRS

49. Sierra Leone National Malaria Strategic Plan 2011-2015, August 2010

50. Sierra Leone Ministry of Health and Sanitation Health Bulletin. Scaling up maternal and child health through Free health Care services, one year on. FHC (April 2010-March 2011) Edition

51. Sierra Leone Ministry of Health and Sanitation, HMIS recorded deaths, 2012

52. SL National Malaria Control Strategic Plan 2011-2015

53. SL KAP survey, 2012

54. Training Manual for Management of Malaria at the Peripheral Health Facilities,

55. Training Manual for Diagnosis of malaria, December 2008

56. World Health Organisation report, 1980

57. World Malaria Report 2012