NATIONAL MALARIA STRATEGIC PLAN

2010 – 2015

MALARIA CONTROL PROGRAM

MINISTRY OF HEALTH & SOCIAL WELFARE

REPUBLIC OF LIBERIA

GLOSSARY OF TERMS

ACT	Artemisinin-based Combination Therapy
BCC	Behavior Change Communication
CCA	Common Country Assessment
CCM	Community Case Management
CHD	Community Health Department
CHO	County Health Officer
CHT	County Health Team
CHSWT	County Health & Social Welfare Team
CHW	Community Health Workers
CMO	Chief Medical Officer
CWG	County Working Group
DCMO	Deputy Chief Medical Officer
GOL	Government of Liberia
HDI	Human Development Index
HFS	Health Facility Survey 2009
HPI	Human Poverty Index
IRS	Indoor Residual Spray
IEC	Information Education and Communication
ITM	Insecticide Treated Material
ITN	Insecticide Treated Net
IPT	Intermittent Preventive Treatment
IDPs	Internally Displaced Persons
KAP	Knowledge Attitude and Practice
LIBR	Liberian Institute of Biomedical Research
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LLIN / LLINs	Long Lasting Insecticidal Nets
MCD	Malaria Control Division
MENTOR	Malaria Emergency Technical and Operational Response
MOE	Ministry of Education
MOH&SW	Ministry of Health & Social Welfare
MPEA	Ministry of Planning & Economic Affairs
MSC	Malaria Steering Committee
NDS	National Drug Service
NGOs	Non-Governmental Organizations
NPM	National Program Manager
NMCP	National Malaria Control Program
OR	Operational Research
OPD	Out Patient Department
RBM	Roll Back Malaria
RFTF	Result Focus Transitional Framework
SP	Sulphadoxine-Pyrimethamine
UL	University of Liberia
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission for Refugee
USAID	United States Agency for International Development
UN	United Nations
WHO	World Health Organization

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EXECUTIVE SUMMARY

Malaria is endemic in Liberia and the entire population of more than 3.47 million is at risk of the disease[1]. Children under five and pregnant women are the most affected groups. According to data from the recent Health Facility Survey (HFS, 2009) malaria accounts for over 34.6% of outpatient department attendance and 33% of in-patient deaths, compared to 37.5% and 44.3% in 2005.

Since August 2005, as part of the previous National Malaria Strategic Plans with funding largely from the Global Fund, some progress has been made in malaria control and prevention based on WHO Roll Back Malaria recommendations to use more effective strategies. The major achievements[2] from August 2005 to October 2009, documented in the 2009 Malaria Indicator Survey (LMIS) include:

- 17% of children under five are receiving prompt and effective treatment for malaria within 24hrs from the onset of fever, up from 5.26% in 2005
- 45% of women are receiving two or more IPTp during their most recent pregnancy, up from 4.5% in 2005
- 47% of households have at least one ITN, up from 18% in 2005
- 27% of children under five slept under an ITN the previous night, up from 2.6%
- 33% of pregnant women slept under an ITN the previous night, up from 31%

This third Liberia National Malaria Strategic Plan for 2010 – 2015 addresses the need to scale-up these malaria control and prevention activities to achieve the *Roll Back Malaria (RBM)* target of reducing malaria morbidity and mortality by half by 2010, as well as the Millennium Development Goals (MDG) of sustaining this progress and beginning to reverse the incidence of malaria by 2015. The third Strategic Plan addresses any gaps observed in the implementation of the First and Interim Strategic Plans and also puts forth a more detailed and well-assessed strategy in dealing with the malaria situation in Liberia by these target dates.

The objectives and activities set out in this document reflect the recommendations of WHO, the Roll Back Malaria Program and best practices and successes from other African countries, to scale-up the most effective malaria control and prevention measures, from the health facility down to the community level, and to involve the private sector and all partners supporting health care delivery in Liberia.

The first strategy for more effective malaria control and prevention is improved treatment through scaled up availability and use of Artemisinin-based Combination Therapy (ACT) as the 1st line treatment for malaria, a product first introduced in 2003. The scale-up is three-tiered: firstly, making available these fixed-dose combination therapies to all health facilities and training the health staff in their use; secondly, reinforcing the role of the community, the community health workers, and community volunteers for Community Case Management of malaria by providing malaria control tools and training these workers for this task; and thirdly, making the same ACT drugs available to the private sector: the private health care providers, pharmacies and drug/medicine stores.

The second strategy is an Integrated Vector Management approach that is also three-tiered. IVM will provide long lasting insecticide mosquito nets through mass distribution to all family units and targeted distribution to pregnant women and children under five, to achieve maximum results for prevention of transmission of malaria. The strategy will also continue targeted indoor residual spraying (IRS) of households and will consider other vector management strategies for environmental control as the complete package to achieve maximum results.

[1] National Population and Housing Census, LISGIS 2007, estimate.
[2] Liberia Malaria Indicator Survey, NMCP 2009

The third strategy will be to increase support for advocacy, health education and behavior change communication at all levels of society – using TV, radio, schools, places of worship – on the importance of ACT therapy, LLIN and other vector management, and the role of the community in malaria control and prevention activities. Cross-cutting strategies with other programs of the MOH&SW will include strengthened health information and capacity building for monitoring and evaluation, strengthened procurement and supply chain management and targeted operational research to review the strategies and activities in place and to identify other activities specific to Liberia's efforts to *Roll Back Malaria*.

To support these strategies and provide the necessary oversight, the capacity of the National Malaria Control Program (NMCP) and its staff will be strengthened to assure the implementation, scale-up, and success in reaching or exceeding the RBM and MDG targets for malaria control and prevention. The NMCP will coordinate the decentralization of malaria control activities throughout the Country and to the County and Community Health Teams. It will lead coordination efforts with all health partners in Liberia, bilateral, INGO, LNGO, and the private sector to accomplish this.

This six- year National Malaria Strategic Plan builds on the achievements made thus far while recognizing the challenges and addresses the essential actions to be taken to reduce the morbidity and mortality trend of malaria in Liberia.

Acknowledge the support of MOH, Deputy, Donors, etc. ???

CHAPTER 1

BACKGROUND AND CURRENT STATUS

1.1 Introduction

This National Malaria Strategic Plan was developed in consultation with partners and stakeholders in malaria control and prevention. The plan creates a framework of priority activities to be carried out at various levels to increase access to and utilization of key malaria control and prevention interventions.

Through previous analysis, surveys, studies and reviews, factors that exacerbate the malaria situation in Liberia have been identified. This document identifies strategic approaches and activities that can alleviate these problems, coordinate efforts and facilitate the achievement of the overall goal of improved malaria control and reduction in morbidity and mortality due to malaria.

Political commitment exists at the highest level as exemplified by the fact that Liberia is a signatory to the Abuja Declaration on Roll Back Malaria (RBM) and currently represents Anglophone West Africa on the board of RBM Africa. This political commitment is also exemplified by the reduction of tariffs and taxes from 25% to 2.5% for insecticide treated nets and insecticides.

This third National Malaria Strategic Plan is being prepared at the time when Liberia is becoming more stable and continuing its transition from humanitarian response to a focus on development. This transition period is characterized by low access to health care (last estimated at 41% in 2007, IPRS)[3] and continued challenges to health care delivery: unrepaired health units, unrepaired roads affecting patient access and health facility support, poor motivation of health staff with low remuneration and incentives, and insufficient trained manpower from a "brain-drain" during the conflict years and insufficient training institutions in the country.

This Plan is based on international best practices and is in line with the RBM recommended strategies for malaria control and prevention in malaria endemic countries. This document provides a blueprint to scale up malaria control in Liberia for the next six years, and builds on the recommendation put forth in the first Strategic Plan (2004-2008) that the strategies for malaria control and prevention should be reviewed periodically and changed as necessary to conform to the existing reality.

To prepare for this revision, the NMCP organized two types of review of the Strategic Plan. The first review in June 2009 lasted two weeks and consisted of short sessions with key NMCP Staff, a Consultant hired by USAID and key NMCP partners and stakeholders. The Plan was reviewed section by section with SWOT Analysis, and then revised based on these findings. This first draft of the Strategic Plan formed the basis of the second exercise: a three-day meeting in November 2009 with key partners to update and finalize the Third Strategic Plan (2009-2015) and make any remaining recommendations for improvement.

The participants at the November review recognized that many issues had arisen during the current year, requiring additions to the Third Strategic Plan and extending the period to 2015. The issues identified included:

- Availability of data on current status of malaria in Liberia (Liberia Malaria Indicator Survey and Health Facility Survey, 2009) which show that, though some improvements have been

[3] Interim Poverty Reduction Strategy (IPRS, 2006)

made, more work needs to be done in order to meet RBM targets for 2010 and Millennium Development Goals (MDG) for 2015.

- Establishment of the Community Health Services Division of the Ministry of Health and Social Welfare and subsequent introduction of a Policy and Strategy for community services which encourages community case management of malaria (CCM).
- Resumption of Integrated Vector Management for vector control, with both long-lasting insecticide nets (LLINs), Indoor Residual Spraying (IRS), and other environmental approaches.
- The need to address both patient and provider concerns of ACT containing Amodiaquine, patient adherence, and lack of access to this product in many communities.

1.2 Liberia Country Profile

Liberia covers 43,000 square miles in West Africa and is bounded by nearly 350 miles of Atlantic Ocean coastline off the southwest and by the neighboring countries of Sierra Leone (northwest), Guinea (north) and Côte d'Ivoire (east and southeast). Its greatest width is 150 miles. Liberia is administratively divided into 15 counties and 95 districts.

Most of the country lies below 500 meters. The coastal areas are characterized by mangrove swamps, which give way to tropical rain forest that gradually thins out northwards to be replaced by deciduous forest. All geographic areas of Liberia are favorable for the vector mosquito of malaria.

Liberia is grouped among the least developed countries in the world and ranks 169 out of 180 countries in the UNDP Human Development Index for 2009[4]. However, this represents a rise of seven (7) ranks since the HDI of 2005. Specific values for the socio-economic profile of Liberia, by year of estimate are illustrated in **Table 1** below.

Poor economic growth performance, high rates of inflation, massive displacements of the agricultural labor force combined with disruption of farming activities in rural areas, and high unemployment rate are manifestations of this unprecedented level of poverty and affect the health care options for the population.

Table 1 – Selected Human Development Indicators[5] [6]

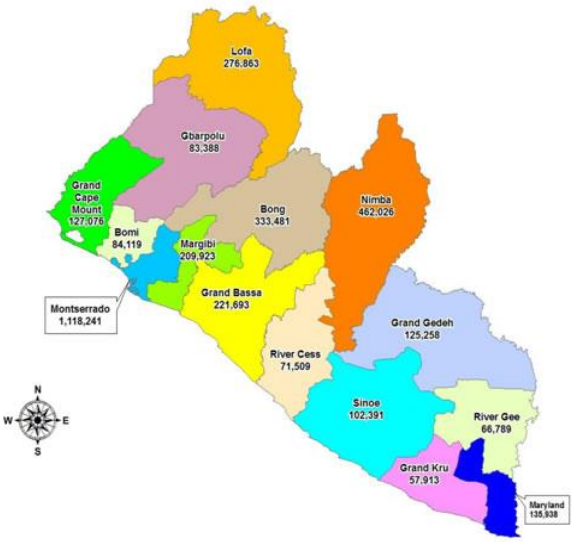
Economic growth rate, 2009	7.1%
GDP Per Capita estimate 2009	$500
External debt burden, GOL April 2009	$1.8 billion
Population in severe poverty, 2008	48% [7]
Population with access to sanitary facilities	45% access to improved; 43% no access[8]
Population with access to safe drinking water	76% [9]
Literacy rate (age 15 – 49)	41% women; 70% men in 2008
Employment rate	77.5% men, 59.2 % women

[4] UNDPs Human Development Index, 2009
[5] National Health Plan, 2007, LISGIS, 2008
[6] 2009 CIA Factbook
[7] Poverty Reduction Strategy, 2008
[8] HMIS 2009
[9] HMIS 2009

1.3 Demographic Characteristics

The most recent national census set the total population of Liberia at 3.47 million[10]. The population distribution by county is illustrated in Figure 1.

Figure 1- Population Distribution of Liberia – 2008 Census



Lofa County	276,836
Bong	333,481
Nimba	462,026
Grand Gedeh	125,258
River Gee	66,789
Maryland	135,938
Grand Kru	57,913
Sinoe	102,391
River Cess	71,509
Grand Bassa	221,693
Margibi	209,923
Montserrado	1,118,241
Bomi	84,119
Grand Cape Mount	127,076
Gbarpolu	83,388
TOTAL	**3,479,581**

Massive population displacement in the rural areas during the fourteen years of crisis accelerated urbanization, resulting in severe overcrowding in towns and cities. Although many people have returned to their homes, particularly in Lofa County, crowding remains a problem for urban areas. The years of instability interrupted education and now Liberia has a literacy rate of only 41% for women. Three fourths of the population live below the poverty line on less than US$1 a day. The economy is, however, making a modest recovery, and there is a gradual improvement in security in rural areas.

Table 2: Selection of Demographic Characteristics 2008 [11]

Population		3.47 million
Annual Population Growth		2.1%
Total Fertility rate		5.2%
Population density		93 per sq mile
Crude mortality rate		90
Under 5 mortality rate		110 per thousand live births
Infant mortality rate		71 per thousand live births
Maternal Mortality Rate		994 deaths per 100,000 births
Average life expectancy		42 years
Population structure	**0 to 4 years**	17.7%
	5 to 14 years	14.8%
	15 and over	67.5%

[10] National Population and Housing Census, 2008
[11] National Population and Housing Census, 2008

1.4 Current Health Status

The health status of Liberia may be summarized as follows:[12]

1)	Infant mortality rate compared to Sub-Saharan average	**71** /1,000 live births versus 102
2)	Under 5 Child Mortality rate compared to Sub-Saharan average	**110** /1,000 live births versus 171
3)	Maternal mortality ratio per 100,000 live births (among highest in the world)	**994**
4)	HIV prevalence estimate (overall, Urban, Rural)	**1.5%; 2.5%** Urban, **0.8%** Rural
5)	Exclusive breast-feeding of children < six months	**19%**
6)	Malaria prevalence (LMIS 2009)	**32%**
7)	Stunted and underweight rates of under-fives	**39%** and **19%**

1.5 Health Care Services Delivery

The Ministry of Health & Social Welfare (MOH&SW) is implementing a National Health Plan (2007 – 2011), with priorities for a Basic Package of Health Services (BPHS) and decentralization of management and implementation of programs to the counties. This plan has identified other priorities for infrastructure development, standardization of incentive structure for health care workers, and support for leadership and management training for the supervisory personnel.

At the central level, all programs of the MOH&SW fall under one of three categories: preventive, curative or social services. Each program, including the National Malaria Control Program (NMCP), develops their activity plans which are then shared to County Hospitals and County Health & Social Welfare Teams (CHSWT). The CHSWT implement many of the programs directly but also support health centers, with training and supervision, to extend health services into the communities. Health centre staff then support, train and supervise the community health workers and volunteers to extend health services to the family level. Local and international non-governmental organizations (NGOs) work in collaboration with the county health teams to support health facilities and have helped to restore services.

Drug and supply chain management for the health services has two components, the National Drug Service (NDS) and the Integrated Supply Chain Management System (ISCMS). The NDS is a semi-autonomous body whose role for malaria control is to store and distribute drugs and consumable supplies to the counties, as directed by the NMCP. For the Integrated Supply Chain Management System there is one Supply Chain Manager in the MOH&SW with overall responsibility and a Supply Chain Manager in each program area, including the NMCP, who are responsible for forecasting supply requirements, procurement of malaria commodities, and monitoring and supervising the use of the products at health facility and community level. The ISCMS has one central depot and nine county depots, with deliveries to the depots quarterly using the push/pull system. Health facilities then request

[12] DHS 2007

from the depots monthly, using the pull system. It is planned to add six depots so that all counties are implementing the ISCMS. At the central level there is a Supply Chain Working Group which has prepared a new logistics management tool to track movement of drugs and other commodities and a SOP Manual for use at health facilities. The SOP Manual has been rolled-out in the capital of all counties. Thirty persons have been trained and certified as master trainers for the ISC Management System. The Logistics Management Information System tools have been distributed to 95% of the health facilities and more than 1000 health workers trained in their use.

Funding for health care in Liberia is a combination of funds from the national budget, bilateral donors, and funding though donors to INGOs and national NGOS. This donor funding has greatly improved the health system since 1997, allowing many health centers to reopen and resume care for the communities. All of these partners are involved in building capacity and improving the health care delivery services of the Ministry of Health & Social Welfare especially through the Basic Package of Health Services (BPHS). This Basic Package focuses on two strategies: (1) a system based on the principles of primary health care, with services available at the peripheral levels of the system and (2) progressive decentralization of the management of the health services to the County level.[13]

Prior to the 1989 civil war, there were 30 hospitals, 130 health centers and 330 health posts. During the war, 90% of the health facilities were destroyed with only 20% being renovated immediately after the war. By 2006, the number of health facilities had increased to 18 hospitals, 50 health centers and close to 286 health clinics. Survey data from the 2008 BHP identified 471 health facilities, with only 361 of them functioning (77%), and the need to reopen, repair, or build 194 additional facilities for a total of 555 to assure access in all areas of Liberia. Currently, the main referral hospital, John F. Kennedy Medical Center, Monrovia, although again open does not have the staffing and infrastructure to function at full capacity for complicated tertiary care.

The current health workforce in 2009 is estimated at 4,000 full-time and 1,000 part-time staff, which includes other professional health workers in lab, pharmacy, OR, etc., in addition to 168 physicians, 273 physician assistants, 453 registered nurses, and more than 1,000 nurse aides and other health professionals. In 2009 there is one training program for physicians and seven training institutions for nurses and other health professionals.

However, the health facilities and staff are not equally distributed throughout Liberia, nor are the staff equally supported with salary and incentives.[14] With renovations of some health facilities by the MOH&SW and support to many other facilities by international NGOs and faith based organizations, there has been an increase in access to a health facility from 16% during the conflict to 41% post conflict. NGOs directly support seventy-two percent (72%) of the government facilities in Liberia[15].

1.6 Challenges to Health Care[16]

The challenges for rebuilding the health system are many and diverse and limit the ability of the MOH&SW to respond fully to the challenge of malaria control and prevention. The most immediate challenge is expanding access to basic health care of acceptable quality, with a health facility within 10km. The Ministry has identified the following key interventions:

- Ensuring the availability of funds at county level to support the continuous delivery of basic services;

[13] Basic Package of Health Services, MOH&SW, June 2008.
[14] National Health Policy, 2007
[15] Ibid, p.15
[16] National Health Plan, 2007

- Improving the availability of essential medicines and other critical health commodities;
- Upgrading the skills of health workers and redeploying them to areas where they are most needed;
- Boosting management capacity at all levels to support the delivery of services, starting with an improved information base and monitoring and evaluation capacity;
- Improving availability of safe water and sanitary facilities for residents of Liberia.

Interventions to address long-term challenges for the Health System include:[17]

- Ensuring the availability of adequate resources to sustain the investments called for by reconstruction, as well as the increased recurrent expenditure induced by it;
- Restructuring resource allocation patterns, so that underserved communities benefit adequately from health sector recovery;
- Reducing the present strategic and operational fragmentation to ensure coherence and efficiency of sector development;
- Upgrading, streamlining and restructuring the workforce, through a long-term training program and the introduction of effective personnel management practices to improve motivation and staff retention;
- Strengthening the supply chain and pharmaceutical management to ensure the availability of affordable, safe, effective essential drugs and other critical commodities;
- Training additional OIC and health staff in the new integrated supply chain management system to assure timely delivery of health products at the service delivery points.
- Revamping the health care network, through targeted investments in health care and support facilities, to increase access to primary and referral health services;
- Establishing effective management systems that are capable of operating a modern health sector and are able to evolve as the context and health needs of the Liberian population change over time;
- Introducing effective regulatory provisions and mechanisms to ensure adhesion to norms, fair and productive competition and quality health services.

1.7 The Malaria Problem in Liberia

1.7.1 Epidemiology

Results from prevalence studies prior to the war classified Liberia as a country with hyper-holoendemic malaria, perennial[18] intense transmission, and considerable immunity outside of childhood. The climate is favorable for mosquito breeding of major vectors for malaria: *Anopheles gambiae* s.s, *An funestus*, and *An melas*. The major parasite species causing disease are *P falciparum* (>90%), *P. Ovale*, and *P. malariae*[19]. Information on the frequency of co-infections, while known to exist, is not available.

According to results from the first post-war *Liberia Malaria Indicator Survey* (LMIS) in 2005, the prevalence of malaria in children under five was 66%. Prevalence rates have since reduced to 32%[20] according to the recent LMIS 2009 data, and are illustrated by region in **Figure 2** below.

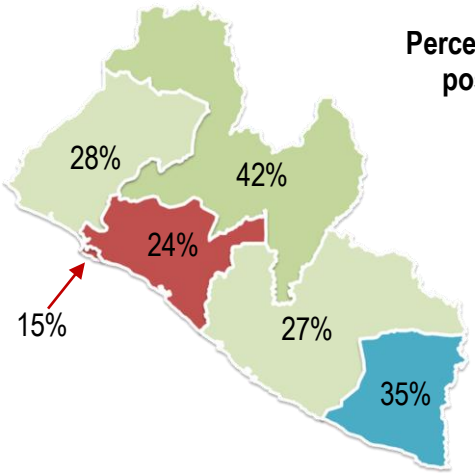
1.7.2 Morbidity and Mortality

Malaria is endemic in Liberia and one of the main public health problems. The entire population of more than 3.4 million is at risk of the disease, with an increased risk to pregnant women and children under

[17] NHP 2007
[18] Hyper – prevalence >75%, Holo – prevalence from 50 to 75%, perennial – transmission from 7 – 12 months/year
[19] Roll Back Malaria-National Desk Analysis-Liberia- 2001
[20] By RDT testing, the prevalence was slightly higher at 37%

five. It is the leading cause of OPD attendance (34.5%) and is also the number one cause of inpatient deaths (33%).[21] Severe anemia from recurrent disease is also a co-morbidity for other diseases and outpatient visits. Lack of access to health care by families and inadequate surface roads preventing medication and control tools from reaching health units contribute to the continued high morbidity and mortality.

Figure 2: Prevalence of Malaria in Children in Liberia by Region[22]



Percent of children 6 to 59 months testing positive for malaria by blood smear:

National average: 32%

North Western: 28%
North Central: 42%
Monrovia: 15%
South Central: 24%
South Eastern A: 27%
South Eastern B: 35%

1.7.3 Socio-economic impact

Even though the socio-economic impact of malaria has not been formally assessed, the cost of treatment to families can be considerable, with payments for medicine and transport to hospital or clinic. The LMIS 2009 survey found a higher prevalence of malaria in children from families in the lowest wealth quintile or with less education. Sickness may cause further losses due to an inability to work or the need to look after other family members thereby preventing attendance at work. The effects of malaria on the community may include substantial financial loss due to the payment of treatment/consultation costs and vector control measures at the household level. Patients with malaria contribute to overburdening an already over-stretched health service. The Global Funds Round 3 and 7 Grants to Liberia, UNICEF and the USAID-funded President's Malaria Initiative (PMI) are helping to reduce the economic burden of malaria by subsidizing the cost of treatment and IPT and IVM for prevention.

1.7.4 Drug Selection and Resistance

The least expensive treatment options of Chloroquine or Fansidar®/SP are no longer appropriate for treatment of malaria in most of Africa, including Liberia. Resistance to chloroquine, which was the 1st line drug for the treatment of uncomplicated malaria until 2003, was first noted in Liberia in 1988. Published and unpublished works by Liberians and partners suggested that chloroquine resistance was between 5% and 17% in 1993 in different parts of the country, and by 1995, had risen to 38%.[23] Extrapolations from PCR analysis studies done in 2001 in Maryland County indicated that resistance to chloroquine was 74% on day 14 (CI 59.7-85.4) and 84% on day 28 (CI 95%: 70.9 – 92.8%).

Resistance to Sulphadoxine Pyrimethamine (SP) which was the 2nd line drug for treatment of uncomplicated malaria was also documented in 2002 in one site in the country, following the pattern of

[21] Health Facility Survey, NMCP, 2009
[22] Liberia Malaria Indicator Survey, 2009
[23] Freeman, T.L., & Bolay, F.T (1995). In vivo response of Plasmodium falciparum to standard chloroquine regimen in Buchanan, Grand Bassa County, Liberia (Unpublished)

SP resistance in other countries in West Africa. Those 2002 results showed a resistance level of 48.5% on day 14 (CI 95%: 36.2-61.0) and 69% on day 28 (CI 95%: CI 95%- 71), [24]

During the complex emergency period (2003), a consensus was reached on the need for a policy change for antimalarial treatment after Artemisinin-based combination therapy or ACT (Artesunate and Amodiaquine) was introduced by humanitarian INGOs working in South-eastern Liberia where Chloroquine resistance had been noted. The new policy recommended the use of ACT instead of Chloroquine for the treatment of uncomplicated malaria and reserved Fansidar® (S/P) for use by pregnant women as IPT.

Since 2003, the approved first line drug for treatment of malaria in Liberia is the Artemisinin-based combination therapy (ACT) of Artesunate and Amodiaquine. No resistance to these drugs has been reported to date in Liberia, although results for an efficacy study of the fixed-dose combination of this drug done in collaboration with MSF/EPICENTRE/DNDI are still pending[25].

1.7.5 Mosquito Net Utilization

The proper use of insecticide treated nets or the long lasting insecticidal nets (LLIN) has been shown to reduce the mortality and morbidity from malaria, especially for those who regularly use them.[26] In addition, it has been shown that when LLIN distribution is high, ITNs/LLINs can also provide protection to others in the same household or nearby.[27] [28]

In Liberia, LLIN availability is now widespread due to the Global Fund Round 3 & 7 grants, the USAID/PMI grant and support from other partners like UNICEF and INGOs. The recent LMIS of 4,162 households documented that 47% of households nationwide have at least one LLIN, while the percentage of children under five who slept under an LLIN the previous night was 26.4%[29]. From this survey, the proportion of women who knew that malaria can be prevented had increased to more than 90% and of these women, about 75% could cite the use of mosquito nets as a means to prevent malaria.[30].

1.7.6 Indoors Residual Spraying

The NMCP has used IRS sparingly and primarily as an emergency response in IDP camps during and after the conflict. In 2008, the use of IRS increased with financial support from PMI. These efforts are the first large-scale IRS intervention to be implemented in Liberia since the malaria eradication era of the 1960s. Activities include important measures to strengthen and develop capacity for IRS, build consensus on strategic issues, facilitate partnership, and ensure effective collaboration to support national efforts to scale up IRS implementation.

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[24] Checchi, F *et al* (2002). High *Plasmodium falciparum* resistance to chloroquine and sulfadoxine-pyrimethamine in Harper, Liberia: results *in vivo* and analysis of point mutations

[25] *Joint Antimalarial Efficacy Study*, Saclepea Health Center, Nimba, 2008-09 (Unpublished)

[26] Lengeler C. *Insecticide-treated bednets and curtains for preventing malaria (Cochrane Review).* The Cochrane Library Update Software [Issue 2], CD000363. 2004. Oxford.

[27] Binka F, Indome F, Smith T: "Impact of spatial distribution of permethrin-impregnated bed nets on child mortality in rural northern Ghana". *Am J Trop Med Hyg* 1998, 59: 80-85.

[28] Hawley WA, Phillips-Howard PA, Kuile FO, Terlouw DJ, Vulule JM, Ombok M *et al*.: "Community-wide effects of permethrin-treated bed nets on child mortality and malaria morbidity in western Kenya". *Am J Trop Med Hyg* 2003, 68: 121-127.

[29] *Liberia Malaria Indicator Survey*, 2009 MOH&SW

[30] Ibid

1.8 Current Malaria Control and Prevention in Liberia

1.8.1 The NMCP and MSC

As a response to the malaria situation in the country, a malaria steering committee (MSC) was formed in 2003 in line with the Roll Back Malaria (RBM) Initiative to strengthen partnerships and coordination. The committee advises and guides the NMCP and other participating partners on the content and organization of their malaria work plan and projects. There are Terms of Reference for this committee, and new organizations working in malaria control and prevention can apply for membership. The MSC meets every month, chaired by the NMCP Program Manager, and is attended by staff of the NMCP and representatives of implementing partners, including other relevant government ministries and agencies, international and national NGOs and funding partners.

Since 2005, there have been widespread malaria prevention and control activities in Liberia as part of the first *National Malaria Strategic Plan, 2005-2008*. This was due to the introduction of a policy for malaria control and prevention by the Ministry of Health & Social Welfare in 2004 and subsequent funding of part of this plan by the Global Fund, USAID/PMI, and other key partners. This third *National Malaria Strategic Plan (2010-2015)*, like the 2005 Strategic Plan, is in line with the Abuja Declaration, which the Government of Liberia signed in 2000. The measures laid out in this Plan for the next 6 years put Liberia on course to achieve the WHO/RBM Africa objective of reducing by 50% malaria morbidity and mortality by the year 2010 and to sustain this progress to correspond with the Millennium Development Goal of having halted and begun to reverse the incidence of malaria by 2015.

Although Liberia was a signatory of the Abuja Declaration in 2000, effective implementation of RBM strategies was delayed until 2005 because of a priority for humanitarian relief and the need to restore services and increase access after the disruption from 2001 to 2004. Although resources from the GFATM were available, procurement and disbursement bottlenecks caused delay in expanding intervention activities until August 2005. However, the MOH&SW of Liberia has made the commitment to match the other Abuja signatories in achieving the reduction in malaria morbidity and mortality by 31st December 2010.

1.8.2 Control Activities

The main focus of the control activities have been directed at the community level, but partner funding has allowed support at the central level of the MOH&SW.

- Malaria case management at health facilities using effective combination antimalarial therapy (ACT – AS/AQ)
- Intermittent preventive treatment for pregnant women with SP (IPTp)
- Integrated Vector Management IVM
    - Distribution and use of insecticide-treated or long lasting insecticidal nets (ITNs and LLINs)
    - Indoor residual spraying in targeted communities
- BCC activities
- Effective stewardship and partnership
- Operational Research
- Monitoring and evaluation (M&E)

1.8.3 Outcome of Current Malaria Control Interventions

In 2009 Liberia embarked on the first large scale Indoor Residual Spraying program in decades. The campaign reached 21,816 households and 20,393 (97%) of structures were sprayed, protecting approximately 5% of Liberia's population (163,149 people). A resistance study done in October 2009 showed that vectors were susceptible to organochlorines, pyrethroids, and carbamates[31].

The 2009 *Liberia Malaria Indicator Survey* assessed malaria knowledge, prevention and treatment practices and malaria and anemia prevalence[32] to guide subsequent control activities to achieve the RBM objectives. The major outcomes of these activities since 2005 are detailed in **Table 3** below. Significant improvements were found for the households with LLINs, the use of LLINs by children, women receiving IPTp, and children receiving prompt treatment for malaria.

Table 3 Outcome of malaria interventions in Liberia: progress towards achievement of RBM 2010 Targets

Core Indicators	RBM target 2010	Baseline MIS 2005	Achievement MIS Feb 2009	Gap
NETS Proportion of households with at least one ITN	**85%**	18%	47% *	**33%**
NETS Proportion of Children under five who slept under an ITN the previous night	**80%**	2.6%	27%	**53%**
NETS Proportion of pregnant women who slept under an ITN the previous night	**80%**	n.a.	33%	**47%**
NETS Proportion of pregnant women who slept under ANY net the previous night	**n.a**	31%	34%	n.a.
IPT Proportion of women who received two or more IPTp during the last pregnancy in the previous two years	**80%**	4.5%	45%	**35%**
ACT Proportion of children under five receiving prompt and effective treatment for malaria within 24hrs from the onset of fever	**80%**	5.26%	17%	**63%**
IRS Number of targeted houses adequately sprayed with a residual and insecticide in the last 12months	**n.a.**		21,816 [33] (4.7% of population)	n.a.

***** An additional 480,000 nets were distributed by September 2009.

The NMCP completed a second survey in 2009, the *Liberia Health Facility Survey,* to assess information not captured by the LMIS, visiting 418 health facilities, reviewing records of patient care and supply chain management, including observation of the stock of ACT on hand. This survey also documented the progress that has been made in malaria control since 2005. TREATMENT – 86% of health workers were prescribing antimalarial drugs according to national guidelines; SUPPLY CHAIN – 85% of the health facilities had antimalarial drugs in stock; PREVALENCE – Malaria was the diagnosis for 38% of the OPD visits of children under 5 years. See **Table 4** below.

[31] *Liberia End of Spray Round Report,* October 2009 RTI/PMI/USAID
[32] *Liberia Malaria Indicator Survey* 2009 MOH&SW
[33] *Liberia End of Spray Round Report*, 2009

Table 4: Key findings of the 2009 Health Facility Survey

INDICATOR	2005	2009
% of HW* who perform well in collection of the history of the disease	56	64
% of HW who search for danger signs	11	20
% of HW who perform well in physical examination of patient	57	50
% of HW who prescribe antimalarial drug according to national guidelines	75	86
% of HW who counsel of patients/caretakers on malaria	26	45
% of HF with copy of national malaria treatment guidelines**	77	77
% of HF with copy of IMCI guidelines	12	45
% of HF with basic materials and equipments (scales, thermometer, syringes)	70	85
% of HF with vaccines for routine immunization of children under five and women (15-49 yrs)	88	75
% of HF with essential malaria drugs: An average of 85% HF had essential antimalarial drugs	48	85
% of OPD attendance due to malaria	38	35
% of OPD attendance due to malaria among children less than five years	59***	38
% of pregnant women with confirmed malaria	31	18
% of population five years and older (excluding pregnant women) with confirmed malaria	56	39
% of patients receiving appropriate malaria treatment within 24 hours	21	35
% of overall deaths with Lab-confirmed malaria (RDT or smear)	44	33
% of Lab-confirmed malaria deaths in children under five years	58	41

*# of HW observed = 750 ** # of HF visited = 418 ***Clinical malaria

1.8.4 Challenges and Opportunities for Malaria Control and Prevention

Despite the achievements from 2005 to 2009, Liberia still faces significant challenges for delivery of quality malaria control and prevention services, but there are opportunities and resources available to address many of them:

Challenges:

- Low overall access to health services (estimated at 41%).
- Poor access to a health facility for remote and hard to reach communities or households
- Poor health seeking behavior of care givers or parents
- Inadequate supply chain system
- Health professionals' reluctance to use Amodiaquine
- Low patient adherence to treatment protocol
- Continued high use of Chloroquine especially in the private sector
- Limited involvement of private sector in the training for and use of ACTs
- Low LLINs use at community and households levels
- Low IPT2 coverage

Opportunities:

- National Health Policy and Plan in place
- Strong leadership and partnership for malaria prevention and control in Liberia
- Current Community Health Services Policy supporting management of malaria at the community level for ACT and IPT
- Sufficient global donor support for LLINs procurement and distribution
- Increasing population demand for mosquito nets
- High proportion of population utilizing private sector when ACT is available though that sector
- Establishment of the National Medicines Regulatory Authority
- Availability of multiple channels for behavior change communication
- An increasingly improving HMIS

1.8.5 Regional and Border Challenges

Liberia shares international borders with three other West African countries with endemic malaria and common vectors. Decisions on treatment protocols and integrated vector management will have an effect on its neighbors, and the reciprocal. Decisions by Liberia's neighbors on their intensity and method of malaria control and prevention will affect residents of Liberia, particularly those on the borders. The NMCP will include specific border sites during the indicator surveys to monitor the prevalence and response to treatment at those locations. The NMCP will establish and maintain effective collaboration with their counterparts in these countries to cooperate in achieving the MDGs.

CHAPTER 2

POLICY SUMMARY

2.1 Vision

A healthier Liberia with universal access to high quality malaria control and preventive services.

2.2 Mission Statement

Providing comprehensive, accessible and affordable quality malaria control and prevention services, focusing on the reduction of malaria burden in the population, especially among the poor and vulnerable groups including pregnant women and children under five years old.

2.3 Program Goal, Objectives and Strategic Interventions

Goal:

To reduce malaria related morbidity and mortality among the population, especially in children under five and pregnant women

General objective:

To reduce morbidity and mortality due to malaria by 50% of baseline by 31st December 2010 and to halt and begin to reverse the incidence by 2015.

Specific objectives:

- To increase access to prompt and effective **ACT** treatment for 80% of the population by 31st December 2010 and sustain this reduction through 2015;
- To increase the use of Intermittent Preventive Treatment (**IPT**) among pregnant women in Liberia to 80% by 31st December 2010 and sustain this use through 2015
- To increase the use of Insecticide Treated Nets (**LLIN**) among the whole population, especially vulnerable populations such as pregnant women and children under five, to 80% by 31st December 2010 and sustain this use through 2015;
- To increase the population protected by indoor residual spraying (**IRS**) from 5% in 2009 to 40% in 2010 and 2011 and scaling up to full coverage by 2015 after evaluation of the first three years of use.

Cross-cutting areas:

- To ensure effective management of malaria control activities and the use of evidence-based information for policy planning by the National Malaria Control Program;
- To monitor progress and evaluate the impact and outcome of planned interventions;
- To increase knowledge, attitude and practice on malaria control and prevention to 90% by 2015;
- To strengthen human resources development;
- To strengthen the Health System.

Strategic Interventions:

The Ministry of Health and Social Welfare shall ensure that malaria control and prevention activities in Liberia follow the principle of the *three ones:*

- one national malaria control coordinating authority where implementation is a country-led process
- one comprehensive plan for malaria control including costed work plans
- one country level monitoring and evaluation framework

These *three ones* will guide the implementation and activities for all interventions:

1. Case Management of malaria with ACT and RDT at health facility and community level – Section 3.1
2. Management of Malaria in Pregnancy (MIP), including IPT – Section 3.2
3. Integrated Vector Management (IVM), with LLINs, IRS, and other environmental interventions – Section 3.3
4. Advocacy and Behavioral Change Interventions – Section 3.4
5. Strengthened Partnership and Improved Programme Management – Section 3.5
6. Operational Research – Section 3.6
7. Monitoring and Evaluation – Section 3.7
8. Health Systems Strengthening – All Sections

2.4 Programme Targets

The targets set for the Strategic Interventions in Chapter 3 reflect both the WHO/RBM and MDG goals to reducing malaria morbidity and mortality in Africa and to reduce the incidence of the disease. Although effective implementation of RBM strategies started in 2005, later than neighboring countries in West Africa and significant challenges remain with low access to health care and poor infrastructure, this third National Strategic Plan sets a framework for meeting the deadline of the Abuja Declaration, by 31st December 2010, and continues activities for additional years to 2015, as part of Liberia's commitment to achieving the Millennium Development Goals.

All Targets set for this Strategic Plan relating to health facility-based services (i.e., access to treatment) take into account the broader plan of the Ministry of Health & Social Welfare for improving health care in Liberia. Detailed Program indicators and targets are found at the end of this document.

The following documents were reviewed for baseline data:

1. Liberia National Health Plan 2007
2. Demographic and Health Survey Liberia, LISGIS 2007
3. Population and Housing Census, 2008
4. The State of the World's Children 2003; UNICEF
5. The Liberia Malaria Indicator Surveys, 2005 and 2009
6. MOH BPHS Accreditation Report, September, 2009
7. MOH Health Facility Survey, 2009

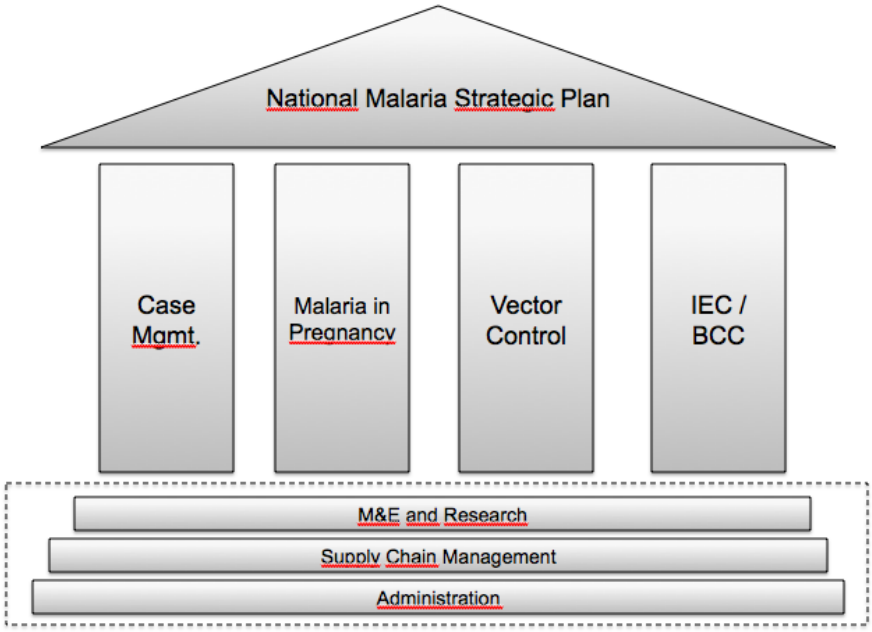
2.5 Policy Details

The fight against malaria in Liberia can be viewed as a "Greek temple," where the National Malaria Control Strategy is the pinnacle of the structure, resting upon four basic technical pillars or strategic interventions:

- Case Management
- Malaria in Pregnancy
- Integrated Vector Management – LLINs, IRS and Environmental Interventions
- IEC / BCC

The four technical pillars in turn rest on a foundation of managerial functions designed to support their rollout and implementation:

- M&E and Research
- Supply Chain Management
- Program Management and Administration



Specific policy statements, objectives and targets for each Strategic Intervention – Case Management, MIP, IVM, Advocacy/BCC/IEC, and the program management functions – are detailed in Chapter 3.

CHAPTER 3

STRATEGIC INTERVENTIONS (2010 – 2015)

3.1 Case Management

3.1.1 Background/Rationale

The LMIS 2009 has documented that malaria continues to account for 34.6% of the total out-patient consultation, 33% of inpatient deaths, and 41% of deaths in the under fives.[34]. The values remain high but represent a decrease in mortality of 25% for inpatient and 12% for under-five deaths.

Factors that continue to contribute to morbidity and mortality include:

- Low access to health services
- Low patient adherence to treatment protocol
- Reluctance to use Amodiaquine
- Continued use of monotherapy and chloroquine, especially in the private sector
- Limited supply of ACTs in the private sector
- Delays in timely delivery of health commodities to all service delivery points

Low access to health services (estimated at 41%[35])—Management of malaria using ACT has been limited to health facilities only, largely because of the complexity of administration of the drug in the current blister pack formulation. Consequently, only those patients with access to a health facility had access to ACT, the approved 1st line treatment for malaria. With the BHSP scale up, the NMCP expects a 5% yearly increase in access to health care but will need to ensure that ACT is available through the private sector and through community distribution to improve case management with ACT.

Health Professionals' reluctance to use Amodiaquine & treatment completion – In Liberia, anecdotal evidence suggests that some health professionals, especially in the private sector, are reluctant to prescribe ACT based on preconceived ideas about the Amodiaquine component. This is largely due to the way in which ACT was introduced in Liberia during the 2003 war. Due to the humanitarian situation at the time, most of the ACTs brought into Liberia by NGOs were administered based on dose by age instead of weight, thus leading to some reported "severe" side effects. As a consequence of these negative reports, the NMCP and her RBM partners launched a massive awareness campaign and health worker training program that is beginning to reverse this trend as evidenced by the just ended *ACT Adherence Study* in Phebe Hospital and Saclepea Health Center which showed that 62.5% of those who took ACT completed the full course of treatment[36]. The NMCP is also planning a change to a fixed-dose tablet preparation of ACT, rather than continuing with the present blister pack of the two separate products.

High circulation of Chloroquine. Chloroquine is still widely used in Liberia. Results from the LMIS 2009 show that 28% of under-fives received treatment with Chloroquine and almost the same percentage (30%) received ACT, the recommended treatment for uncomplicated malaria.[37] The continued use of Chloroquine will prevent reduction in morbidity and mortality, and the awareness campaign must continue efforts to change this behavior.

[34] Liberia Malaria Indicator Survey, 2009
[35] NHP, 2007
[36] ACT Adherence Study, NMCP 2009
[37] LMIS, 2009

Limited supply of ACTs in the Private Sector Studies show that close to half (46%)[38] of the population receive treatment from the private sector in Liberia, yet there is limited supply of ACT in this sector. This is a contributing factor to high circulation of Chloroquine and must be addressed to improve case management. The MOHSW is implementing an MOU for the private health facilities in Liberia so that they can receive the approved antimalarials and testing materials from the Supply Chain Management System. As part of this Strategic Plan 2010-2015, another MOU will be prepared to allow private pharmacies and drug stores to receive ACT for distribution, with details of purchase and selling prices still to be determined.

3.1.2 Policy Statement

The Ministry of Health and Social Welfare/NMCP shall ensure that:

1) All health facilities in the country (public and private) treat malaria according to the national treatment guidelines:
   - ACT as 1st line drug for the treatment of uncomplicated malaria, currently Artesunate and Amodiaquine, in a fixed dose combination.
   - Oral quinine as 2nd line drug for the treatment of uncomplicated malaria
   - Oral quinine for children weighing 5kg or less
   - Oral quinine for the treatment of pregnant women with uncomplicated malaria during the 1st trimester
   - Oral quinine or ACT (Artesunate + Amodiaquine) for pregnant women with uncomplicated malaria during the 2nd and 3rd trimesters
   - Parenteral Quinine (quinine IV) or IM Artemether for complicated/severe malaria.
2) ACT is available in all pharmacies and drug stores.
3) All counties provide community-based case management of malaria and home-based management of fever.
4) Confirmatory diagnosis (through RDT and/or microscopy) is available at all health facilities (public and private) and performed on all suspected cases as per national treatment guidelines.
5) Confirmatory diagnosis will be available through RDT at the community level and performed on all suspected cases as per national treatment guidelines.
6) All antimalarial drugs used in Liberia will meet the requirements of the Liberia Medicine Regulatory Authority.
7) All pre-service training programs for health workers will include malaria case management in the curriculum.

3.1.3 Objective

To increase access to prompt and effective treatment, reaching 80% of the population by 31st December 2010 and sustaining at least this level through 2015

3.1.4 Targets & Indicators:

- At least 80% of patients with uncomplicated malaria receive early diagnosis and are provided with prompt and effective treatment according to MOH&SW guidelines.
- At least 65% of patients with complicated or severe malaria are timely diagnosed and receive correct treatment according to MOH&SW guidelines.

[38] LMIS 2009

  - All clinical health facility workers are trained in management of malaria with ACTs and RDTs. (e.g. MDs, RN, PA, CM, LPN, NA, dispensers)
  - All health training institutions have malaria case management incorporated into their curriculum and the staff to lead this training. (physician, nursing, midwifery, physician assistants, pharmacy, *et al*).
  - All private sector pharmacists and drugstore personnel are trained and are correctly providing ACT and Quinine.
- 80% of children under five with fever are able to access effective treatment for malaria within 24 hours.
  - General CHVs are trained to provide ACT and/or refer for malaria case management.
  - Community IMCI programs provide ACT to children under five according to MOH&SW guidelines.
- 80% of health facilities (public or private) carry out malaria diagnostic tests accurately.
  - All health facilities (public and private) have RDT available for malaria diagnosis and at least 1 staff person trained in this procedure.
  - All health facilities (public and private) with lab services have at least one functional microscope and at least 1 laboratory technician trained in malaria microscopy.
- 100% of health facilities have approved, quality anti-malarial drugs available with no stock-out lasting more than 1 week.
  - The Supply Chain and Management System of the MOH&SW is implementing an improved management of procurement, stock keeping and distribution.
  - 100% of anti-malarial drugs used in Liberia meet the requirements of the Liberia Medicine Regulatory Authority.
  - All health facilities are using the integrated supply chain management tools.
  - All 15 counties have a functioning Drug Supply Depot, with staff trained for supply chain management.
- 100% of health facilities are recording accurate data on the diagnosis and treatment of patients with fever. See also Section 3.8, M&E.

3.1.5 Strategies:

Key strategies include the following: review of malaria treatment guidelines to ensure coordinated implementation at all levels; capacity building of health care staff to improve skills; improved access to diagnostics and treatment services at health facility and community level; assuring private health facilities, pharmacies and drug stores are included in ACT provision; and strengthened health support systems to support and monitor planned activities.

3.1.6 Main Activities

- Train facility and community-level health workers, care-givers, and pharmacy owners and staff in case management and referral according to the MOH&SW Guidelines.
- Train additional cadres, General Community Health Volunteers (gCHVs) and staff of Community IMCI programs, in malaria case management with ACT.
- Ensure that all health training institutions include malaria case management in their curriculum.
- Engage the private sector on mechanisms of ACT rollout to the private sector.
- Train staff for all facilities in improved diagnosis of malaria by RDT and / or microscopy and monitor the quality of the microscopic diagnosis.
- Improve the procurement, distribution and monitoring the usage of anti-malarial drugs and diagnostics to prevent stock-out at all levels.

- Improve the health information system for monitoring diagnosis and treatment of persons with malaria.
- Assure that RDTs and antimalarial products used in Liberia are regularly tested for quality.

3.1.7 Milestones

- Consensus on private sector involvement in ACT administration reached by January 2010.
- Guidelines on administration of ACTs at health facilities, pharmacies and community level available and implemented from February 2010

3.2 Malaria in Pregnancy

3.2.1 Background/Rationale

Malaria infection during pregnancy, especially with *P.falciparum,* is a risk for a wide range of adverse consequences for the pregnant woman, the developing fetus and the newborn infant. One common effect of malaria infection in pregnant women is anemia, which is often severe and may be life threatening. One main effect for the newborn infant is low birth weight, which is associated with greater risk for disease and death[39].

The RBM strategic framework for malaria prevention and control during pregnancy in areas of stable transmission recommends three interventions: intermittent preventive treatment (IPT), long-lasting insecticide treated nets (LLINs) and effective case management of malaria illness and anemia. Studies have shown that the use of at least two doses of IPT by pregnant women can improve the outcome of pregnancies for both the mother and the fetus. A number of studies have shown that the regular use of LLINs reduces both morbidity and mortality from malaria. Thus Liberia will focus on these proven cost-effective interventions of IPT and the use of LLINs to prevent malaria in pregnant women, providing health benefits to both mother and newborn. Case-management for pregnant women is addressed in Section 3.1.2.

Since the introduction of IPT in Liberia, the use of Sulphadoxine/Pyrimethamine (SP) for IPT has been gradually increasing, paralleling the gradual increase in access to health care. The proportion of pregnant women receiving at least 2 doses of IPT had increased to from 4.5% in 2005 to 45% at the time of the LMIS 2009 survey. IPT administration has been restricted to health facilities, through the antenatal clinics (ANC), limiting coverage of this intervention. To reach the RBM targets, IPT will also be provided at community level by trained traditional midwives (TTMs) as part of the new MOH&SW Community Health Services strategy.

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The distribution to and use of LLIN by pregnant women needs immediate scale-up. Although the 2009 LMIS showed that LLINs use by pregnant women had increased, the increase was small overall, from 31% using any net in 2005 to 33% using a treated net in 2009. However, among pregnant women in households with LLINs, net usage was high, with 63% reporting they had slept under a net the previous night. It follows that an even higher proportion of pregnant women would be using LLINs if they had received them through mass distribution to households or ongoing distribution through antenatal clinics.

3.2.2 Policy Statement

The Ministry of Health and Social Welfare/NMCP shall ensure that:

1) All health facilities in the country (public and private) treat malaria in pregnancy according to the national treatment guidelines;

[39] Section 4 *Malaria during Pregnancy,* WHO Africa Malaria Report 2003

2) All health facilities in the country (public and private) provide Intermittent Preventive Treatment (IPTp) according to the national MIP guidelines.
3) IPT will be provided at community level according to the national MIP guidelines and the National Policy and Strategy for Community Health Volunteers.
4) LLINs will be provided to all pregnant women

3.2.3 Objectives

- To increase access to prompt and effective treatment for at least 80% of pregnant women by 31st December 2010 and to sustain this level through 2015
- To increase the use of at least two doses of Intermittent Preventive Treatment (IPT) among pregnant women to at least 80% by 31st December 2010 and to sustain this level through 2015
- To increase the use of insecticide treated/insecticidal nets (ITNs, LLINs) among pregnant women to at least 80% by 31st December 2010 and to sustain this level through 2015

3.2.4 Targets:

- At least 80% of pregnant women attending antenatal consultation receive IPT according to the national MIP protocol.
- 80% of all pregnant women diagnosed with malaria at health facilities (public or private) receive prompt and effective treatment according to national treatment protocol.
- All pregnant women with suspected malaria at community level are referred to the nearest health facility and receive prompt and effective treatment according to the national treatment protocol.
    - All clinical health facility workers are trained and monitored for quality management of malaria in pregnancy (e.g. MDs, RN, PA, CM, LPN, NA, dispensers)
    - All health training institutions have management of malaria in pregnancy (MIP) incorporated into their curriculum and the staff to lead this training.
    - All TTMs and gCHV are trained in prevention of MIP
- At least 80% of pregnant women attending antenatal consultation receive a LLIN.
    - At least 85% of women of child-bearing age sleep under LLINs
- 100% of health facilities have SP available for IPT, with no stock-out lasting more than one week
    - The Supply Chain and Management System of the MOH&SW at central and health facility level is implementing an improved system for procurement and record keeping.

3.2.5 Strategies

Key strategies will include the following: increasing access to IPT for pregnant women by improvements in supply chain and by expanding the delivery of IPT to include the TTMs; integrating the implementation of IPT and LLIN for pregnant women into relevant programs for Reproductive Health and EPI.

3.2.6 Main Activities

- Train health workers for management or referral of malaria in pregnancy including administration of IPT according to MOH&SW guidelines
- Include training in MIP in all pre-service health professionals training programs (physician, nursing, midwifery, physician assistants, pharmacy, et al).

- Train the TTMs in the management of malaria in pregnancy
- Train TTMs and gCHV on BCC strategies to promote the regular use of LLINs by pregnant women and early care seeking from appropriate providers for case management.
- Improve the procurement, distribution and monitoring usage of SP to prevent stock-out at all levels.
- Complete the distribution of LLINs to households.
- Provide ongoing distribution of LLINs to women attending ANCs.

3.2.7 Milestones

- Guidelines for revised MIP implementation disseminated to all by March 2010.
- Community Leaders and Women's groups have been informed of the new MIP guidelines and their role in the implementation of MIP.
- Wide scale implementation of IPTp by February 2010.

3.3 Integrated Vector Management

3.3.1 Background/Rationale

Measures to prevent malaria reduce the risk of infection and save lives. Since 2001 the World Health Organization has been promoting Integrated Vector Management (IVM) as the strategic approach for vector control.[40] IVM is defined as the targeted use of different vector control methods alone or in combination to prevent or reduce human-vector contact cost-effectively, while addressing sustainability issues.[41] IVM in Liberia will include an initial geographical reconnaissance and mapping for identifying target areas, regular monitoring and compliance inspections, and recruitment and training of the field technicians. .

Integrated Vector Management requires a decision on those interventions that could be used in combination depending on suitability for Liberia. They include the use of long-lasting insecticidal nets and indoor residual spraying to prevent mosquito to human contact and improvements in environmental sanitation and control of potential breeding sites to reduce the vector population. Many IVM interventions also reduce the risk of other communicable diseases.

Long Lasting Insecticidal Nets (LLINs)

Of the various vector control methods available, sleeping under insecticidal nets (LLINs) is the most widely used in Liberia. The proper use of LLINs has been shown to reduce the incidence of malaria in the population, especially for those who regularly use them, and extends a secondary benefit to others who sleep in the same room. In Liberia, the availability and use of LLINs is improving due to strong commitment at all levels (GOL, donors and RBM partners). The 2009 LMIS results indicate that 47% of households have at least one LLINs and that 27% of children under 5 and 33% of pregnant women had slept under a net the previous night. While these are improvements compared to baseline in 2005, scale-up is needed to reach the RBM Abuja Declaration Target of 80% coverage by December 2010.

Indoor Residual Spraying (IRS)

The effectiveness of IRS in reducing malaria transmission and disease burden has been demonstrated in many parts of the world. From 1958-1961, UNICEF and WHO sponsored a malaria eradication project in Liberia which demonstrated that the anopheline vectors were highly susceptible to a single annual application of DDT and that interruption of transmission was technically feasible in the forest

[40] *Workshop Report,* WHO regional Office for Africa; 2001.
[41] *Malaria Journal* 2008, **7:**164

areas of Liberia. Although this pilot project demonstrated a dramatic reduction in malaria transmission and incidence, it was not taken to scale in Liberia or other African countries at that time.

The strategic objectives of IRS in Liberia with its perennial transmission are to quickly reduce transmission intensity and suppress seasonal peaks, thereby reducing overall transmission and complementing the use of LLINs to reduce prevalence, morbidity and mortality.[42] IRS will be continued in the districts covered in 2009 and expanded outward to districts of high malaria prevalence, reaching approximately 50% of the Liberian population in 2010 and 2011. Changes in prevalence, morbidity and mortality in these sprayed districts will be reviewed and compared with areas where IRS was not used to make a decision for scale-up by 2015.

The selection of insecticides to be used will be based on vector susceptibility, WHOPES approval, and registration in Liberia for use in the spray areas. Other criteria used in selection will be safety, cost, and durability of effective action. A resistance management program with surveillance sites will be instituted to ensure the long term efficacy of the insecticides. The success will depend on an understanding of the entomology and ecology of the mosquito vectors in Liberia which include vector feeding and resting behaviors, community acceptance of the spraying, and local capacity to manage, monitor and sustain the program.[43] A list of WHO-recommended chemicals for IRS is illustrated in **Table 5** below.

Table 5: Insecticides Recommended by WHO for IRS[44]

INSECTICIDE	CLASS	DURATION OF ACTION
Dichlorodiphenytrichloroethane (DDT)	Organochlorine	>6 months
Fenitrothion	Organophosphate	3-6 months
Malathion	Organophosphate	2-3 months
Primiphos-methyl	Organophosphate	2-3 months
Propoxur	Carbamate	3-6 months
Bendiocarb	Carbamate	2-6 months
Alpha-cypermethrin	Pyrethroid	4-6 months
Cyfluthrin	Pyrethroid	3-6 months
Deltamethrin	Pyrethroid	3-6 months
Etofenprox	Pyrethroid	3-6 months
Lambda-cyhalothrin	Pyrethroid	3-6 months
Bifenthrin	Pyrethroid	3-6 months

Environmental Management / Larviciding

Environmental management strategies have shown sustainable reductions in transmission, morbidity and mortality when integrated with other interventions. These strategies are designed to prevent mosquito maturation by eliminating breeding sites, providing a community-wide protective effect, and are useful in peri-urban and urban areas where transmission is focal.[45] Environmental management in Liberia will be a community-based activity to apply larvicdes to breeding sites in urban areas and will be complementary to current vector control efforts of IRS and LLINs. Mapping and community sensitization will precede larviciding, to start in 2011. The success will depend on identifying breeding

[42] WHO Global Malaria Programme *Indoor residual spraying*, 2006.
[43] Tozan et al, Am. J. Trop. Med. Hyg. 2007
[44] Pesticides and their application for vector control, WHO, 2006
[45] Singer et al, Lancet, 2005

sites, using an effective chemical or biological agent, and sustaining this application on a regular and indefinite basis.

Cross-cutting Support Activities for IVM

For indoor residual spraying, mapping will be undertaken in the targeted districts to summarize accessibility and number, type and distribution of structures to be sprayed, with the information used to calculate program inputs: quantities, timing, and staff requirement. Entomological field staff will be supported during initial and ongoing data collection. Regular post-spray environmental compliance evaluations, in collaboration with the Environmental Protection Agency of Liberia and the Ministry of Agriculture, will be done to minimize potential risks to human health and the environment from the use of the pesticides.

3.3.2 Policy Statement

The Ministry of Health and Social Welfare/NMCP shall ensure that:

1) Control of malaria in Liberia includes effective Integrated Vector Management interventions (LLINs, IRS and Environmental Management);
2) Long lasting insecticidal nets are available to the entire population of Liberia without cost: routinely to pregnant women and children under five in ANC and EPI, mass distribution to households in 2010, and replacement distribution to households in 2013-2014.
3) The Environmental Health Team of the CHSW Teams shall be responsible for IRS in all targeted areas;
4) Only WHOPES-approved insecticides that have been registered and also approved by the NMCP/MOH&SW shall be used in Liberia for vector control.

3.3.3 Objectives

- To reduce the transmission of malaria by scaling up effective vector control interventions (LLINs, IRS, and Environmental Management) to 85% of the population.
- To increase the use of insecticide treated/insecticidal nets (ITNs, LLINs) among the whole population, especially pregnant women and children under five to 80% by 31st December 2010, and sustain this use up to 2015.
- To increase the coverage of IRS from 5% to 50% of the population of Liberia by 2011 and to evaluate the benefit prior to scale-up by 2015.

3.3.4 Targets:

- At least 90% of families have received at least one LLIN.
- At least 85% of children and pregnant women sleep under LLINs.
- At least 85% of the general population sleep under LLINs.
- At least 85% of the households in targeted districts are protected by IRS by 2015.
- NMCP will implement environmental management of vectors in cities, towns, and large communities.
- 100% of identified breeding sites in the targeted districts are treated with larvicides.

3.3.5 Strategies

Key strategies will include the following: mass distribution of LLIN to households and targeted distribution to pregnant women and children under 5; selection of target districts for IRS using malaria prevalence data from the LMIS 2009 with indoor residual spraying of 85% of households in the target

communities; capacity building of the health system at all levels to increase distribution and use of LLIN; support to research institutions for study and implementation of other environmental and biologic control efforts in target communities.

3.3.6 Main Activities

- Procure sufficient LLINs to allow distribution door-to-door with "hang-up, keep-up, and follow-up" campaigns to meet the RBM target by 31st December 2010.
- Improve the supply chain mechanism to assure that all facilities have LLINs for supply to pregnant women and children under 5 through ANC and EPI activities.
- Prepare and disseminate the new IVM implementation guidelines.
- Map district-specific information on vector and malaria prevalence as part of IVM.
- Strengthen the capacity of the County Health & Social Welfare Teams to implement IRS.
  - CHSWTs will be trained for monitoring and supervising the quality of IRS.
  - CHSWTs will recruit the spray operators, in collaboration with the NMCP.
  - The CHSWTs with the NMCP will provide field training for spray personnel in February 2010.
- Improve the supply chain mechanism and equipment maintenance for the insecticides, sprayers, and protective clothing required for IRS.
- Ensure monthly meetings of the IVM Task Force.
- Ensure annual planning and review meetings for IVM at both county and national level.

3.2.2.7 Milestones

- New IVM Implementation Guidelines completed by February 2010
- IVM Implementation Guidelines disseminated from March 2010.
- LLINs available and routinely distributed in all ANC and EPI services by March 2010.
- Development of Larviciding Standard Operating Procedures by middle of 2011.

3.4 Advocacy, IEC, and Behavioral Change Interventions

3.4.1 Background/Rationale & Challenges

People must have knowledge of the recommended measures to control, prevent and treat malaria before they can change their behavior to improve health. New knowledge must be presented in such a way to change attitudes and behavior before the prevalence and incidence of malaria can be reduced by effective interventions. In Liberia the recent MIS has shown that 98% of women/care-givers have heard malaria messages and 84% know that mosquitoes cause malaria. A slightly lower proportion (76%) reported knowing that malaria can be prevented using mosquito nets. These caregivers also reported that malaria can be treated with chloroquine or with ACT, 50% and 49% respectively.

However, in spite of this knowledge, results from the LMIS 2009 showed that there is still low use of these interventions – ACT and LLINs[46]- with only 27% and 33% of children and pregnant women reporting that they slept under a net the night prior to the survey. The use of ACT as first line treatment is not the prevalent treatment choice, affected both by knowledge and access to facilities with ACT available for treatment and the continued use of chloroquine.

[46] LMIS 2009

Poor health-seeking behavior of care givers or parents

Two important challenges to reaching the RBM goal of prompt ACT treatment for malaria are the delays by patient or family in seeking health care and the continued use of pharmacies and drug stores as first place for treatment. The recent LMIS2009 results indicate that 24% of those surveyed would first seek treatment from pharmacy or drug store, and since the supply of ACT in those locations is limited, the patient would not be receiving effective treatment.

Prompt and effective treatment of malaria within 24 hours of onset of fever is very important in preventing progression of the disease to severe malaria and mortality, and also reducing gametocyte population, reducing transmission.[47] The recent Health Facility Survey (HFS, 2009) showed that only 35% of the cases presenting at the health facility arrived within 24 hours of onset of fever.

People's Perception of Amodiaquine & Treatment Completion

Misconceptions on treatment with the current ACT anti-malarial containing amodiaquine exist in both health staff and patients and care-givers. Anecdotal reports suggest that some people in Liberia are reluctant to use the current ACT based on lack of adequate information on its benefit or preconceived ideas that the Amodiaquine component is not well-tolerated. This results in some patients given ACT taking only the Artesunate tablets and even some health personnel providing only the Artesunate.

To combat this misconception, the NMCP and her RBM partners launched a massive awareness campaign in 2005 to increase the acceptance of ACT by the general population. A 2009 study at Phebe Hospital and Saclepea Health Center, the *ACT Adherence Study* showed that 62.5% of patients who took ACT completed the full course of treatment[48]. However, this adherence level is unacceptably low for a first-line antimalarial and indicates the need for increased education at all levels.

Low use of insecticide nets (ITNs or LLINs) in the community

The use of LLINs is essential to control and prevent malaria in Liberia. In the recent MIS survey, although 76% of women acknowledged that malaria can be prevented by regular use of LLINs, use by women in households with LLINs is only 61%. LLINs coverage nationally had increased from 18% to 47% of households, but the use of LLINs for the key target groups, children under five and pregnant women remains low at 26% and 33% overall. Once nets have been provided to a household, this usage increases to 51% and 63% respectively.[49]

The NMCP will continue to work alongside the Health Promotion Division of the MOH&SW to develop new materials, revise existing tools, and test and disseminate health messages and materials relating to all aspects of malaria control and prevention. This intensified health information campaign will be directed at the general population to increase their knowledge to change attitude and practice for improved malaria control and prevention. Advocacy will also be directed to the highest levels of national, local and traditional government and the private sector to share these messages.

[47] Expect Opinion, Informa Pharmacother, 2007
[48] ACT Adherence Study, NMCP 2009
[49] LMIS, 2009

3.4.2 Policy Statement

The Ministry of Health and Social Welfare/NMCP shall ensure that:

1) All messages used for behavior change activities are in line with the MOH material production guidelines and are technically accurate;
2) The Ministry of Education joins efforts to incorporate malaria prevention messages into the school curriculum;
3) Advocacy for improved malaria control and prevention reaches all decision makers on public policy.

3.4.3 Objectives

Behavior change messages and multimedia messages help assure that:

- Children under five receive effective ACT treatment within 24 hours after the onset of signs and symptoms of malaria, covering at least 80% of children by 31st December 2010 and sustaining this to 2015.
- Women receive at least two doses of IPT during pregnancy.
- Residents of Liberia are aware of the benefits and are using LLINs to prevent malaria, especially the priority targets of pregnant women and children under 5.
- The acceptance of IRS is increased to at least 85% of households in the targeted districts of high prevalence.

3.4.4 Targets:

- All health facilities (public and private) are providing updated malaria health education.
- 90% of the population has heard a malaria message through the multimedia channels.
- 80% of community health committees are reached with advocacy activities.
- 80% of civil society leaders (local, clan, women, trade union, youth, etc.) are reached with advocacy activities.
- All legislators and county superintendents are provided with information on the strategies for prevention, control and treatment of malaria according to the MOH&SW guidelines.
- All trainings for malaria control and prevention include an interpersonal counseling and communication component.
- All teachers and instructors in primary and secondary schools are trained for child-to-child communication of malaria messages.
- All schools receive BCC materials on malaria control and prevention and include this information in the science curriculum.

3.4.5 Strategies

Key strategies will include the following: using a multichannel approach for health education with emphasis on radio messages; using the community health volunteers as the key change agent for dissemination of malaria messages in the communities; using peer educators, trained care-givers, traditional authorities, and child-to-child communication as agents for behavior change; using social mobilization and health system support for capacity building at all levels.

3.4.6 Main Activities

- Revise communication strategy and health education materials to address the challenges already identified that prevent acceptance of LLINs and ACT and monitor the effect on behavior.

- Provide the gCHV with training and tools for them to reach directly to the parents, care givers and households with the information on management of malaria in Liberia.
- Use mass media and community mobilization campaigns and provide materials in advance of the annual observance of *World Malaria Day* in April.
- Include training in interpersonal communication skills during both in-service and pre-service training of health personnel.
- Expand the program of peer educations to deliver malaria control messages, and provide them with guidelines for improved communication.
- With the MOE, train school teachers in child-to-child communication for malaria education.
- Explore other advocacy activities with all relevant stakeholders.

3.4.7 Milestones

- Revision of current communication and advocacy strategy document completed by February 2010
- Dissemination and implementation of revised strategy begun by March 2010.
- First selection of revised IEC materials available by February 2010 and evaluated during the post-LLIN distribution survey in July 2010.

3.5 Program Management and Partnership

3.5.1 Background/Rationale

In order to ensure that the National Malaria Control Program is able to carry out its functions of coordinating and providing expert advice on malaria prevention and control activities for Liberia, the program and staff need additional training and support for more effective program management, monitoring & evaluation, and partnership. This capacity building will be a continuous process, ensuring that at all times the Program has the necessary technical capability, resources, and information needed to carry out its responsibilities, including fostering effective partnership among all the stakeholders. **Figure 3**, below, the NMCP Organogram, illustrates the various sections of the program and task division.

Historically, health care delivery in Liberia has been one of partnership between government, faith-based organizations, concessions, international and local humanitarian agencies and private practitioners, including traditional healers and community health workers. Hospitals, health facilities, and training programs have and continue to benefit from these partnerships. Appropriate mechanisms will be established at national, county, health facility and community levels to increase the coordination and collaboration among partners for malaria control.

3.5.2 Policy Statement

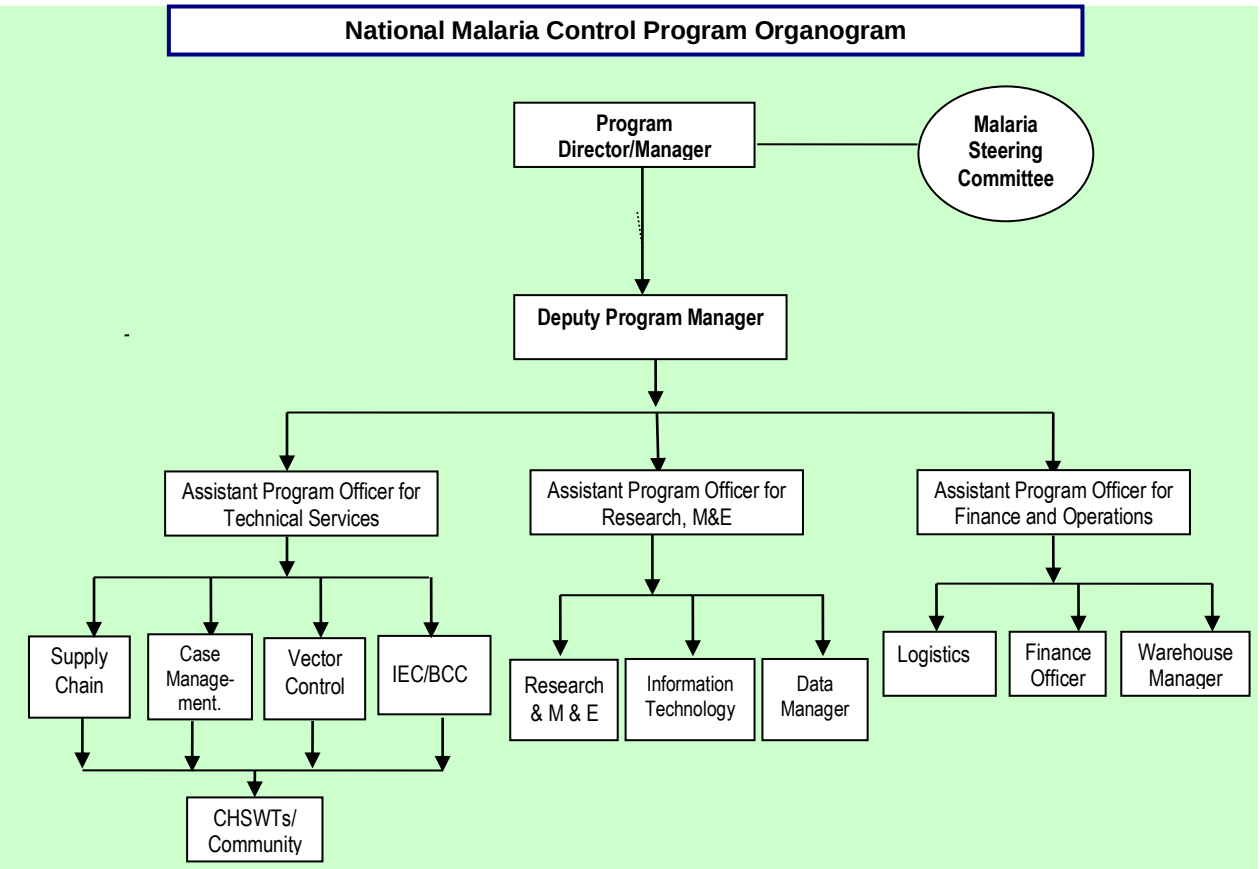
The Ministry of Health and Social Welfare shall ensure that:

1) The National Malaria Control Program receives the staff and support to improve the management of malaria control and use of resources.
2) All partners and relevant stakeholder are invited and encouraged to participate in malaria control and prevention activities and steering committees.
3) All partners supporting malaria control activities are using the national guidelines.

3.5.3 Objective

- The National Malaria Control Program provides effective management and supervision of all malaria control activities in Liberia.
- The NMCP is equipped to effectively coordinate malaria control activities at national and county level.
- The NMCP builds the capacity of the CHSWT to coordinate malaria control activities at district and community level.

Figure 3: Organogram of the NMCP



3.5.4 Targets:

STAFFING:

- The number and qualifications of the NMCP staff are increased, by recruitment of new staff or transfer from other MOH&SW programs and by sending existing staff for post-graduate education, to give a team consisting of:
    - Three (3) public health specialists
    - Two (2) medical entomologists
    - Two (2) parasitologists
    - Two (2) data managers, with additional training in disease surveillance
    - Two (2) monitoring and evaluation specialists
    - Two (2) IEC/BCC focal persons
    - Two (2) supply chain management specialists
    - Two (2) financial management specialists

CAPACITY:

- All Units of the NMCP are strengthened and have a plan for regular in-service professional training for the staff. (Data, IEC/BCC, IVM, Case management, MIP, Finance & M&E)
- At least four consultants (4) are identified to provide supervision for operational research, financial management, epidemiology, and training in health statistics until all positions of the NMCP are filled and existing staff have completed their trainings.
- Funding is available for NMCP staff to receive incentives commensurate with qualifications and experience, to provide continuity for malaria control program interventions.
- The MOH&SW and international donors support the NMCP logistics with funding for the necessary vehicles, fuel, generator, stationery, and administrative support.
- The office and conference facilities for NMCP are adequate and equipped for the expanded staffing and program activities required for comprehensive malaria control and prevention in Liberia.

COORDINATION & PARTNERSHIP:

- Malaria Steering Committee (MSC) meetings are held monthly to provide policy advice and guidance to the Program, with minutes circulated to the members.
- The MSC identifies task forces or sub-committees required to assure that all Targets and Objectives for malaria control are achieved.
- The NMCP provides regular program updates to the MOH&SW Malaria Task Force, at the quarterly meetings, or more often as requested.
- The NMCP provides training and materials so that NGO members of the MSC can expand IEC/BCC activities and help implement community-based management of malaria and fever, the distribution of LLINS and other IVM.

3.5.5 Strategies

The Ministry of Health and Social Welfare shall ensure that malaria control and prevention activities in Liberia follow the principle of the *three ones*: one national malaria control coordinating authority (the National Malaria Control Program), one comprehensive plan for malaria control, and one country level monitoring and evaluation framework.

Key interventions will include the following: capacity building at all levels, resource mobilization, programme management support, partnership strengthening for malaria control at all levels, and recruitment of additional local NGOs to participate in control activities as necessary.

3.5.6 Main Activities

- Build capacity of the National Malaria Control Program and all CHSWT staff responsible for malaria control & prevention.
- Review on a monthly basis the HMIS data related to malaria control from the health facilities in Liberia and the progress information on other program targets (i.e., LLINs, IVM, training, etc.).
- Chair the regular meetings of the Malaria Steering Committee and facilitate communication among partners on progress toward program objectives.
- Organize and attend the quarterly meetings of the MOH&SW Malaria Task Force for two-way sharing of program accomplishments.
- Promote coordination and collaboration among partners involved in malaria control and prevention at community, district, county and national levels.
- Promote public-private initiatives for improved malaria control.
- Schedule biannual and annual review of national malaria control and prevention activities, including strategic plan, policies and guidelines, and recommend changes as required for improved malaria control.

3.5.7 Milestones

- Inventory of program management needs developed by end of December 2009.
- A partnership framework and profile established by February 2010.
- Partnership structures established and functional at all levels by 2013.

3.6 Operational Research

3.6.1 Background/Rationale

Issues related to malaria control including program interventions must be based on evidence that is generated through various forms of research and evaluation of best practices. Operational research can be an important component of malaria control in that strategies and activities can be reviewed, and evidence generated can be used to fill gaps and to help policy makers make informed decisions. It can also contribute to regular assessment and evaluation of interventions for program strengthening.

Liberia has chosen to implement strategies for malaria control and prevention well studied by WHO, RBM and other international initiatives. The introduction of LLINs, ACT, MIP/IPT and IVM in Liberia offer program areas for operational research to determine the appropriateness of the strategies taken to ensure that targets are met. The NMCP has experience in operational research, working with research institutions and technical agencies on several aspects of malaria control. Recent intervention-focused studies conducted in collaboration with partners include the *ACT Tolerability and Efficacy Studies* with MSF/Epicentre/DNDI and *ACT Adherence Studies* with the Pacific Institute for Research and Evaluation (PIRE)/UL. These studies have been helpful to focus the BCC information that is needed for behavior change for improved case management. Funding will be requested in support of this strategic plan to continue this collaboration for improved malaria control and prevention.

In addition, sentinel sites have been established in collaboration with the MENTOR Initiative in an effort to provide a reliable health facility-based surveillance system, using the facilities' reports to estimate the trend of malaria morbidity and mortality and response to treatment. By 2011, a sentinel site will be functioning in each of the six regions. The NMCP will also add vector surveillance to some of these sentinel sites to monitor the effectiveness of both the IRS and larviciding activities in those regions.

Other areas of interest for operational research include the following:

- Intervention studies on ACT: monitoring of patient response to treatment, delivery strategies for ACT
- Intervention studies on LLINs: comparing delivery strategies, acceptability
- Vector and vector control studies
- Studies on malaria epidemiology in Liberia: stratify the vector zones, establish an insectary at LIBR.

3.6.2 Policy Statement

The Ministry of Health and Social Welfare shall ensure that:

1) Liberia develops a national research agenda and implementation norms.
2) Operational research is a key strategy for effective malaria prevention and control.
3) Partners are identified to help expand research activities.

3.6.3 Objective

- The NMCP uses operational research to generate evidence for policy decisions and improved program management.
- In partnership with higher educational institutions in Liberia, NMCP operational research contributes to the knowledge of malaria epidemiology and control in coastal West Africa.

3.6.4 Targets:

- By the end of 2010, vector surveillance activities and equipment will be in place in three of the sentinel sites, with an insectory at LIBR.
- By the end of 2011, vector surveillance will be implemented in all regions receiving IRS or larviciding.
- By 2015, the NMCP will have completed four (4) studies on the current or alternative antimalarial drugs.
- By 2015, the NMCP will have completed two (2) studies on the effectiveness of current or alternative insecticides.
- By 2015, the NMCP will have completed two (2) studies on adherence to ACT.
- By 2015, the NMCP will have completed two (2) studies on LLINs.
- By 2015, the NMCP will have completed two (2) studies on malaria epidemiology.

3.6.5 Strategies

Key strategies will include the following: collaboration with research institutions, universities and other partners to undertake relevant operational research for malaria control program and policy improvement; capacity development at all levels for operational research and health system strengthening.

3.6.6 Main Activities

- Adapt WHO and regional guidelines on RBM operational research for use in Liberia.
- Train relevant health personnel at national and county levels for operational research.
- Develop specific study designs for the priority interventions and identify partners to conduct the operational research.
- Set up and monitor the data results from the six Malaria Sentinel Sites.
- Monitor the vector surveillance information and meteorological data to provide accurate monthly and quarterly vector bionomic information to help evaluate and guide the progress of the IVM interventions.
- Assure funds for NMCP staff to participate in international conferences and workshops related to healthcare, malaria prevention, and disease control.

3.6.7 Milestones

- Revised guidelines for operational research adapted by the end of 2010.
- Revised research agenda available by mid-2011.
- Vector surveillance at Sentinel Sites operational by June 2010.

3.7 Monitoring and Evaluation

3.7.1 Background/Rationale

Monitoring and evaluation is a crosscutting issue and major component of both the MOH&SW and the National Malaria Control Program. It is an essential activity to assure that accurate health information is gathered, analyzed and used to track performance and implementation.

The NMCP will develop a comprehensive monitoring and evaluation plan for the current Malaria Strategic Plan in collaboration with the Monitoring and Evaluation Unit of the Department of Planning at the Ministry of Health and Social Welfare and other technical partners. This plan will be closely integrated with the Health Management and Information System (HMIS) of the Ministry of Health. A more detailed operational monitoring & evaluation plan will be prepared on an annual basis and revised when necessary. Malaria specific indicators will be selected from the RBM core indicators as well as program-specific indicators to measure performance. All data collected (routine and surveys) will be analyzed and reports produced and shared with stakeholders.

3.7.2 Policy Statement

The Ministry of Health and Social Welfare shall ensure that:

1) Monitoring and evaluation occurs at all levels of malaria control and prevention activities;
2) Sentinel sites are established to monitor morbidity, mortality, and drug usage information;
3) Sentinel sites in IRS target areas monitor vector bionomics and susceptibility to insecticides;
4) A pharmacovigilance structure is in place to monitor adverse effects of the recommended antimalarial treatments.

3.7.3 Objective

- The M&E Unit of the NMCP monitors progress toward Program goals and evaluates the impact and outcome of planned interventions.
- The NMCP implements evidence-based programme management, including the establishment of sentinel sites in each region for data monitoring and vector surveillance.

3.7.4 Targets:

- By the end of 2010, the NMCP will have regular monitoring of program activities, with surveillance data and regular feedback mechanisms at the national level.
- By 2011 all six regional sentinel sites will be operational.
- The M&E Unit will prepare an Implementation Plan annually, the first to be completed by March 2010.
- The M&E Unit will provide the data for the biannual and annual review of program activities and the Annual NMCP Malaria Report.
- By 2011, the NMCP will have trained at least 30 county M&E officers in data management and will have trained at least one M&E officer for each County Hospital.
- By April 2011, M&E Units will be established in each county with staff trained for evidence-based program management.
- By February 2010 the NMCP will have trained 45 entomological technicians for deployment to counties and the national program.
- The M&E Unit will design and coordinate national surveys with partners to track progress and evaluate outcomes and impacts:
    - Health Facility Surveys every 1 year
    - Malaria Indicator Surveys, every 2-3 years
    - Program Review, Sept 2010 for progress on RBM targets,
    - Program Review Mid-2015 to prepare for the next revision of the Strategic Plan.

3.7.5 Strategies

Key strategies will include the following: preparing standard reporting tools for tracking malaria health information as part of the HMIS of the MOH&SW; strengthening of M&E at the national and county levels with in-service training for NMCP and CHSWT staff; strengthening the operation of the Sentinel Sites with regular supervision and support; and organizing regular feedback and reporting to CHSWT and partner stakeholders.

3.7.6 Main Activities

- Prepare a yearly M&E Unit Work Plan, for incorporation into the annual NMCP plan that details the M&E plans for all elements of malaria control: case management, IVM, MIP.
- Work with the M&E Unit of the Department of Planning at the MOH&SW to prepare a revised and standard set of tools for health system M&E.
- Strengthen data units and the routine data collection, collation, analysis, and reporting at all levels to support evidence-based programming and management.
- Carry out quarterly field visits to the County Health Teams and view reports of their monthly visits to the county health facilities.
- Conduct quarterly mini-surveys to estimate coverage of interventions
- Conduct annual Health Facility Surveys to assess health worker and facility performance
- Lead planning and implementation of regular Liberia Malaria Indicators Surveys.
- Produce Quarterly and Annual Report on Malaria Control and Prevention for sharing with the MSC, Malaria Task Force, and partners.
- Complete a baseline entomological study to support regular IRS quality assessments, with half-yearly bioassays for insecticide effectiveness. (OR?)

3.7.7 Milestones

- LMIS results available by November 2009.
- Revised M&E guidelines adapted and disseminated by February 2010.
- National M&E Plan for Malaria Control and Prevention available by March 2010.
- Yearly M&E Operational Plan available by March 2010.
- M&E Tools revised and disseminated by March 2010.
- NMCP staffs have completed in-service training on the new M&E tools and operational plan by March 2010.
- In-service training for all 30 county registrars, in collaboration with the M&E Unit of the MOH&SW completed by April 2010.

3.8 Implementation Arrangements

The National Malaria Control Program is the technical arm of the Ministry of Health and Social Welfare responsible for planning, training, monitoring, and coordinating malaria control and prevention activities throughout the country. It leads regular evaluation of program achievements and ongoing challenges and adjusts program design as needed. It has the responsibility to mobilize resources, financial and material, and distribute them to county health teams and partners to achieve the objectives and targets delineated in this Strategic Plan . And it is responsible to share this information through regular meetings of the Malaria Steering Committee and the Malaria Task Force.

This third National Malaria Strategic Plan details the intervention activities planned for continued efforts for malaria control. The NMCP provides staff for each of these units and has identified partners to assist them in the field:

- Training / Malaria Case Management

- Management of Malaria in Pregnancy
- Integrated Vector Management (IVM)
- Research, Surveillance, Monitoring and Evaluation
- Data Management
- Supply Chain Management
- IEC/BCC /Advocacy
- Program Management and Planning

Consistent with the MOH&SW emphasis on decentralization, the activities under each unit above will be coordinated at the county level through the County Health & Social Welfare Teams (CHSWT), led by County Health Officers. The CHSWT will work closely with Community Health Department under the supervision of Community Health Directors, using health staff, CHWs, TTMs, and gCHV to reach mothers and caregivers at household level, for improved malaria control and prevention throughout Liberia,

This Strategic Plan has an immediate target date of 31st December 2010 for significant improvement in malaria control, but this progress must be continued and extended to all areas of Liberia, as the MOH&SW extends basic health services to those locations without access to health facilities in 2009. Additional resources will be required to achieve all activities and targets of this third National Strategic Plan through the year 2015 to maintain Liberia's progress to achieving the Millennium Development Goals.

Implementation Schedule & Milestones: ***D R A F T***

UNIT		ACTIVITY	DATE
Program Management	1	Inventory of program management needs available	
Program Management	2	Partnership framework and profile established	
Program Management	3	Partnership structures established and functional at all levels	2013
Program Management	4	National launch of increased program activities: meeting with CHO and the CHSWT staff for malaria control	
Program Management	5	Consensus on private sector involvement for ACT	
Program Management	6	Guidelines on ACT administration at HF, Pharmacies and community available	January 2010
Case Management	1	Discussion with the Private health facilities on 1st and 2nd line treatment and requirements for data reporting	
Case Management	2	Discussions with the Pharmacy and drug stores sector, multiple discussions?, time line for delivery of product, how to monitor data and quality	
Case Management	3	Training begins for ACT use: CHWST, HC staff, etc.	
Case Management	4	Development of cIMCI and home-based availability of ACT;	
Case Management	5	Program for pre-service education developed with training units.	
Case Management	6	Implementation of new ACT administration at pharmacies, drug stores	Start February 2010
IVM	1	Decision on how to deliver the LLIN – house-to-house	

		and routine ANC/EPI	
IVM	2	Needs assessment for IVM completed	
IVM	3	Development and Dissemination of IVM implementation guidelines	
IVM	4	Stock of LLIN for ANC and EPI at all CHSWT	
IEC/BCC	1	Revised communication and advocacy strategy document available	February 2010
IEC/BCC	2	The revised BCC materials are prepared and launched by - -	World Malaria Day April 2010
IEC/BCC	3	Evaluation of success of IEC materials	July 2010 MIS survey follow-up
MIP	1	Guidelines for revised MIP implementation disseminated	
MIP	2	Community leaders and women's groups informed for new MIP guidelines	
M&E	1	LMIS results available	November 2009
M&E	2	Revised M&E guidelines adapted and disseminated	February 2010
M&E	3	National M&E plan for Malaria Control and Prevention available	March 2010
M&E	4	Yearly M&E operational plan available	March 2010
M&E	5	Capacity strengthened:	
M&E	6	M&E Tools revised and disseminated	March 2010
Supply Chain	1		
Operational Research	1	Revision of a research agenda available	
Operational Research	2	Revised guidelines for operational research adapted	
Operational Research	3	Establishment of Vector Surveillance at Sentinel Sites	