



Malaria Business Plan

2014-2017

NATIONAL MALARIA ELIMINATION PROGRAMME

FEDERAL MINISTRY OF HEALTH

Foreword

The future of financing for malaria control has been of concern following the global economic recession and hence the need to both diversify and expand funding sources for malaria control in Nigeria. This business plan has been developed to in part; help address shortfalls in malaria financing that have delayed the achievement of global milestones in reducing morbidity and mortality. Our goal at the National Malaria Elimination Programme is to bring high-impact evidence based interventions to reduce the burden of malaria to pre-elimination levels by 2020. It is an ambitious goal but we are confident that with the mobilization of adequate resources, it is a goal that is achievable and will put us on course to malaria free future.

The main objective of this business plan therefore, is to mobilize the Government of Nigeria, State Governments and other government agencies, Nigerian taxpayers and private sector corporations, individuals and international partners of malaria in Nigeria towards the provision of adequate resources to achieve our goal of zero malaria mortality by 2020. It is also intended to provide first-hand information for all stakeholders on strategic areas for investment, targets to be achieved and potential impact on health.

This business plan covers the first four (2014-2017) of the seven years of the National Malaria Strategic Plan (NMSP) 2014-2020. It was developed through a consultative process following the development of the NMSP 2014-2020 and includes inputs from the SWOT analysis done during development of the strategic plan, epidemiological reports and previous funding history for malaria interventions in the country. It is therefore aligned to the strategic plan and national operational planning cycle and has taken into consideration the realities of massively scaling up the programme within the context of existing weak health systems, by including resources to strengthen these systems to ensure programme success.

There are three main sections in this business plan. The first provides background information on malaria in Nigeria and the organization of the malaria programme at different levels. The second outlines the key interventions and activities for implementation in the period 2014-2017, and the resources required to achieve desired impact. The Roll Back Malaria Partnership in Nigeria has agreed upon these interventions as having the potential for the greatest impact on malaria. The third section summarizes financing needs by intervention area and justifies the need for continued financing for malaria in Nigeria. It also outlines strategies to be used in resource mobilization, potential risks and risk mitigating factors.

This business plan is intended for use by the malaria programme and partners at National, State and Local Government Area to ensure mobilization and allocation of adequate resources to implement annual operational plans. The business plan will also provide partners and potential donors with an overview of strategies planned and investment required to achieve intended targets.

The key to successful malaria control and elimination is partnerships. The NMEP is committed to engaging new partners and strengthening existing partnerships as crucial to the attainment of our vision of a malaria free Nigeria. I would therefore like to urge everyone to join us in this noble venture and secure the health of future generations.

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Table of Contents

Foreword.....	ii
Acknowledgements	iv
Table of Contents	v
List of Tables and Figures.....	vii
List of Abbreviations	viii
Executive summary	x
1. Introduction	1
1.1 Epidemiology of malaria in Nigeria	1
1.1.1 Population at risk and malaria prevalence	1
1.1.2 Malaria parasites	1
1.1.3 Malaria vectors	1
1.1.4 Disease burden	1
1.2 Progress with malaria control in Nigeria	2
1.2.1 Background	2
1.2.2 Achievements from 2009 to 2013	3
1.2.3 Integrated Vector Management.....	3
1.2.4 Malaria case management.....	4
1.2.5 Prevention of Malaria during Pregnancy.....	5
1.2.6 Procurement and Supply Chain Management (PSCM) for malaria commodities.....	5
1.2.7 Advocacy Communication and Social Mobilization (ACSM).....	5
1.2.8 Monitoring and Evaluation (M&E)	5
1.3 Challenges	6
1.3.1 Integrated Vector Management.....	6
1.3.2 Diagnosis and Treatment	7
1.3.3 Malaria in Pregnancy.....	7
1.3.4 Advocacy Communication and Social Mobilization.....	7
1.3.5 Procurement and Supply Management System.....	7
1.3.6 Monitoring and Evaluation.....	8
1.4 Lessons learnt and recommendations	8
1.4.1 Integrated Vector Management.....	8
1.4.2 Diagnosis and Treatment	8
1.4.3 Malaria in pregnancy	9
1.4.4 ACSM	9
1.4.5 Procurement and Supply Management Systems.....	9
1.4.6 Monitoring and Evaluation.....	10
1.4.7 Programme Management.....	10
2 Implementation Framework 2014-2017	11
2.1 The National Malaria Elimination Programme.....	11
2.1.1 Vision.....	11
2.1.2 Mission	11
2.1.3 Organization	11
2.1.4 Responsibilities	13
2.1.5 Financial Management.....	13
2.2 National Malaria Strategic Plan (NMSP) 2014-2020	15
2.2.1 Goal	15
2.2.2 Objectives.....	15
2.3 Strategic areas for investment 2014-2017	17
2.3.1 Malaria Prevention	17
2.3.2 Malaria Case Management	26
2.3.3 Advocacy communication and social mobilization (ACSM)	31
2.3.4 Surveillance Monitoring and Evaluation	33
2.3.5 Procurement and Supply Chain Management (PSCM)	36
2.3.6 Programme Management.....	38

3	Financing	40
3.1	Background	40
3.2	Rationale for continued investment in malaria	40
3.2.1	Social and economic impact of malaria in Nigeria	40
3.2.2	Funding for malaria control and elimination in Nigeria is a priority	42
3.2.3	Value for money	44
3.3	Financial Gap Analysis 2014-2017	46
3.4	Funding needs by intervention	47
3.4.1	Malaria prevention.....	47
3.4.2	Malaria diagnosis and treatment.....	47
3.4.3	Programmatic support.....	48
3.5	Resource Mobilization Plan	48
3.5.1	Preamble	48
3.5.2	Sources of Financing.....	49
3.6	Benefits of Investing in Malaria	51
3.6.1	Positive impact on Millennium Development Goals (MDG)	51
3.6.2	Health systems strengthening.....	52
3.6.3	Return on investment	53
4	Risks and mitigating factors	54
4.1	Dependence on external resources	54
4.2	Commodity security	54
4.3	Fluctuating commodity costs	54
4.4	Resistance to medicines and insecticides	54
4.5	Governance, financial control and oversight	55
4.6	Insecurity	55
5	Conclusion	56
	References	57

List of Tables and Figures

List of Tables

Table 1.1	Summary of achievements in malaria control 2009 – 2013
Table 2.1	Indicators for Universal Coverage with LLINs
Table 2.2	LLIN requirements and budget
Table 2.3	IRS Indicators
Table 2.4	IRS requirements and budget
Table 2.5	Indicators for larval source Management
Table 2.6	LSM requirements and budget
Table 2.7	Indicators for IPTp
Table 2.8	Requirements and budget for IPTp
Table 2.9	Indicators for SMC
Table 2.10	Requirements and budget for SMC
Table 2.11	Indicators for malaria diagnosis
Table 2.12	Requirements and budget for malaria diagnosis
Table 2.14	Requirements and budget for malaria treatment
Table 2.15	Indicators for iCCM
Table 2.16	Requirements and budget for iCCM
Table 2.17	Indicators for ACSM
Table 2.18	ACSM budget
Table 2.19	Indicators for Surveillance, M&E
Table 2.20	Budget for Surveillance and M&E
Table 2.21	Indicators for PSCM
Table 2.22	PSCM Budget
Table 2.23	Indicators for management and coordination
Table 2.24	Programme management and coordination budget
Table 3.1	2014-2017 budget in US dollars by objective
Table 3.2	Financial Gap Analysis in US Dollars
Table 3.3	Resource mobilization objectives and outcomes

List of Figures

Figure 2.1	Organizational Chart of the National Malaria Elimination Programme
Figure 3.1	Sources of Financing for Malaria in Nigeria
Figure 3.2	2014-2017 budget by service delivery categories
Figure 3.3	Examples of private sector engagement in malaria control
Figure 3.4	Effects of malaria interventions on the health system

List of Abbreviations

ACSM	Advocacy Communication and Social Mobilization
ACT	Artemisinin based Combination Treatment
AMFm	Affordable Medicines Facility - malaria
ANC	Antenatal Care
AQ	Amodiaquine
ATM	AIDS, Tuberculosis and Malaria
CHAI	Clinton Health Access Initiative
CORPs	Community Own Resource Persons
DHIS	District Health Information System
DOT	Directly Observed Treatment
DRC	Democratic Republic of Congo
EIR	Entomological Inoculation Rate
EPI	Expanded Programme on Immunization
FMOF	Federal Ministry of Finance
FMOH	Federal Ministry of Health
HH	Household
HMIS	Health Management Information System
iCCM	Integrated Community Case Management
IPCC	Interpersonal Communication and Counselling
IPTp	Intermittent Preventive Treatment in Pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
IVM	Integrated Vector Management
LGA	Local Government Area
LiST	Lives Saved Tool
LLIN	Long Lasting Insecticidal Net
LMIS	Logistics Management Information System
LSM	Larval Source Management
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MGT	Management
MICS	Multiple Cluster Indicator Survey
MIS	Malaria Indicator Survey
MNCH	Maternal Neonatal and Child Health
NAFDAC	National Agency for Food and Drug Administration and Control
NDHS	Nigeria Demographic and Health Survey

NEMA	National Emergency Management Agency
NGN	Nigeria Naira
NGO	Non-governmental Organization
NMCP	National Malaria Control Programme
NMEP	National Malaria Elimination Programme
NMIS	Nigeria Malaria Indicator Survey
NMSP	National Malaria Strategic Plan
NPC	National Population Commission
NPHCDA	National Primary Health Care Development Agency
OR	Operational Research
<i>PPR</i> ₂₋₁₀	Plasmodium falciparum prevalence in 2-10 year olds
PMI	United States President's Malaria Initiative
PPMV	Patent Proprietary Medicine Vendors
PSCM	Procurement and Supply Chain Management
RAcE	Rapid Access Expansion Project
RDT	Rapid Diagnostic Test
RMC	Role Model Caregiver
SMC	Seasonal Malaria Chemoprophylaxis
SP	Sulphadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Executive summary

Background

Significant investments in malaria control in Nigeria have been made in the last decade following the National Strategic Plans: 2001 – 2005, 2006 – 2010 and 2009 – 2013. However malaria is still highly endemic in Nigeria, making it one of the countries with the highest global burden of malaria. Current reports suggest that an estimated 97% of the country's 174.5 million population is at risk of malaria. The 2014 – 2020 Malaria Strategic Plan focuses on a major scale up of key interventions based on evidence and the experiences from previous years. The goal of the strategic plan is to reduce malaria burden to <5% malaria related deaths to zero by 2020. The purpose of this business plan is to provide a detailed four-year (2014 – 2017) investment and implementation framework for malaria control in Nigeria. The purpose of this business plan is to support mobilization of adequate resources from Federal and State Governments, Private Sector and external partners, in order to realise the goals of the national strategic plan.

Strategic areas for Investment

The NMSP has prioritized the scale up of cost-effective high impact interventions in the first four years of implementation. The interventions are categorized under malaria prevention, malaria case management and supporting interventions.

Malaria Prevention

An investment of US \$ 1.6 billion will be required to effectively deliver malaria prevention services in Nigeria over 4 years from 2014 to 2017. Universal coverage with long lasting insecticidal nets for all persons at risk is the key malaria prevention strategy targeting the entire population. A total of 97 million LLINs will be distributed through mass campaigns from 2014 to 2016 to achieve universal coverage. Nets distributed in 2014 will be replaced in 2017 in order to maintain high and effective coverage. In addition, over the four-year period, 28 million nets will be distributed to pregnant women through antenatal clinics and 21 million to infants through child health clinics. A total of US\$ 950 million comprising 58% malaria prevention costs will be required to achieve and maintain universal coverage.

Other prevention interventions include indoor residual spraying, which will be scaled up in targeted areas to protect up to 30% of the population by 2017. The investment required to cover 30% of the population annually to 2017 is US \$ 580 million or 36% of prevention costs. About US\$ 2 million will be invested annually in larval source management using larvicides. An investment of US\$ 53 million (3% of prevention costs) will be used to ensure availability of

preventive medicine and create demand for appropriate prevention and treatment services among pregnant women. This investment has the potential of reducing malaria specific maternal mortality by 44% by 2017. Seasonal malaria chemoprevention is a new intervention to be implemented for the first time in nine States in the Sahel. It has the potential of reducing annual malaria burden in children less than five years by 75%. An investment of US\$ 35 million (2% of prevention costs) will be required to deliver preventive treatment to all children at risk.

Malaria Case Management

An investment of US \$ 1.3 billion over four years will be required to ensure access to diagnostic services in the public sector and universal access to effective malaria treatments at all levels of health care in all sectors. A total of US \$ 740 million will be required to procure and deliver rapid diagnostic tests (RDTs) and 7,900 microscopes (98% of costs); to provide training for health workers and to establish quality assurance systems for diagnostic services (2%). The aim is to improve quality of care for malaria and of other non-malarial fevers, to minimize use of ACTs for non-malarial fevers, and to enable documentation of true malaria cases. An investment of approximately US \$ 560 million will be required over four years to provide malaria treatment. Nearly 81% of the funds will be spent on ACTs, and other medicines, while 9% each will be spent on training health facility workers and community health workers respectively. Other activities include supportive supervision, quality assurance and resistance monitoring and pharmacovigilance.

Supporting interventions

These include monitoring and evaluation; advocacy and behaviour change communication; procurement and supply chain management; and programme coordination and management. An investment of approximately US \$ 43 million over four years, representing 5% of the overall budget will be required to ensure programme implementation.

Funding Needs

A total of US \$ 2.95 is required to implement activities over the four-year period from 2014-2017. Of these funds, approximately US \$ 495 is available or committed for the period and US \$ 384 in 2014 alone. The funds exclude funding from the Global Fund to be made available from 2015 on successful submission of a funding concept note. This leaves a funding gap of US \$ 2.5 billion that the National Malaria Elimination Programme seeks to fill by mobilizing the Federal and State Governments, the Nigerian private sector, traditional donors for malaria to invest more for a malaria free future.

Value for money and Impact

Investment in malaria control and elimination is value for money. The current strategies for malaria prevention and treatment are evidence based, and globally recommended for effectiveness. True value for money is achieved when universal coverage for populations at risk is achieved. In Nigeria, the goal is to achieve economy, efficiency, effectiveness and equity in coverage with appropriate interventions depending on the sub-national malaria epidemiological profile.

If universal coverage targets with prevention and treatment interventions are achieved, it is estimated that this will result in a progressive reduction in malaria specific under-five mortality to reach 50% by 2017, saving over 134,000 lives. In addition, the interventions have the potential of reducing by 44% malaria specific maternal mortality and saving over 1,500 neonates annually.

Conclusion

Nigeria bears the highest burden of malaria illness and death globally. It is ranked first by the Roll Back Malaria Partnership in terms of investment needs to reduce global burden of mortality. The country has set a target to achieve malaria prevalence below 5% and zero malaria mortality by 2020. In order to put the country on the path to achieve this goal, a total of US \$ 2.9 billion will be required to scale up prevention and treatment interventions from 2014 to 2017. This amounts to about US\$ 17 for every individual at risk over four years.

1. Introduction

1.1 Epidemiology of malaria in Nigeria

1.1.1 Population at risk and malaria prevalence

Malaria is endemic in Nigeria with all year transmission and 97 percent of the population living in areas of high malaria risk. There are pockets of low malaria risk within high altitude areas of the Federal Capital Territory, Adamawa and Borno States. The 2010 Nigeria Malaria Indicators Survey (NMIS) revealed that malaria parasite prevalence in Nigeria is high, with an average parasite prevalence of 42% among children under five years of age with zonal variations ranging from 27.6% in the South-east to 50.3% in the South-west zone.

1.1.2 Malaria parasites

Plasmodium falciparum is the predominant parasite species in Nigeria. The NMIS conducted in 2010 found that among children under 5 years infected with malaria, 84% had pure *P. falciparum* infections while 11% had mixed infections comprising *P. falciparum* and *P. ovale* or *P. malariae* or both. Five percent of infections were either pure or mixed infections with *P. malariae* or *P. ovale*. No *P. vivax* infections were found.

1.1.3 Malaria vectors

The major malaria vectors are the *Anopheles gambiae* complex (*An. gambiae* s.s. and *An. arabiensis*) and the *Anopheles funestus* group. These three species are widely distributed across the country, from the mangrove and coastal areas of the south to the Sahel savannah of the far north. Transmission studies show that entomological inoculation rates (EIR) range from 18-145 infective bites per person per year (ppy) for *An. gambiae* in the north central and 12-54 infective bites ppy for *An. funestus* in the southwest and between 0-12 bites ppy for *An. arabiensis*.

1.1.4 Disease burden

Malaria is a major cause of morbidity and mortality in Nigeria and accounts for 60% of outpatient visits and 30% of hospitalizations among children under five years of age. In 2010, the NMIS found an overall national malaria prevalence of 42% in children under-five at community level (NPC et al., 2012) while in 2013, a cross-sectional study involving 120 health facilities in six states found that on average 59% of children presenting with fever at health facilities across the country tested positive for malaria using rapid diagnostic tests (RDTs). The rates varied between states with the lowest being 16% in Lagos state and the highest, 71% in Kwara state (Mokuolu et al., 2013).

It is estimated that over 200,000 children die from Malaria annually in Nigeria (NPC et al., 2012). To put this in perspective, more than 80% of estimated

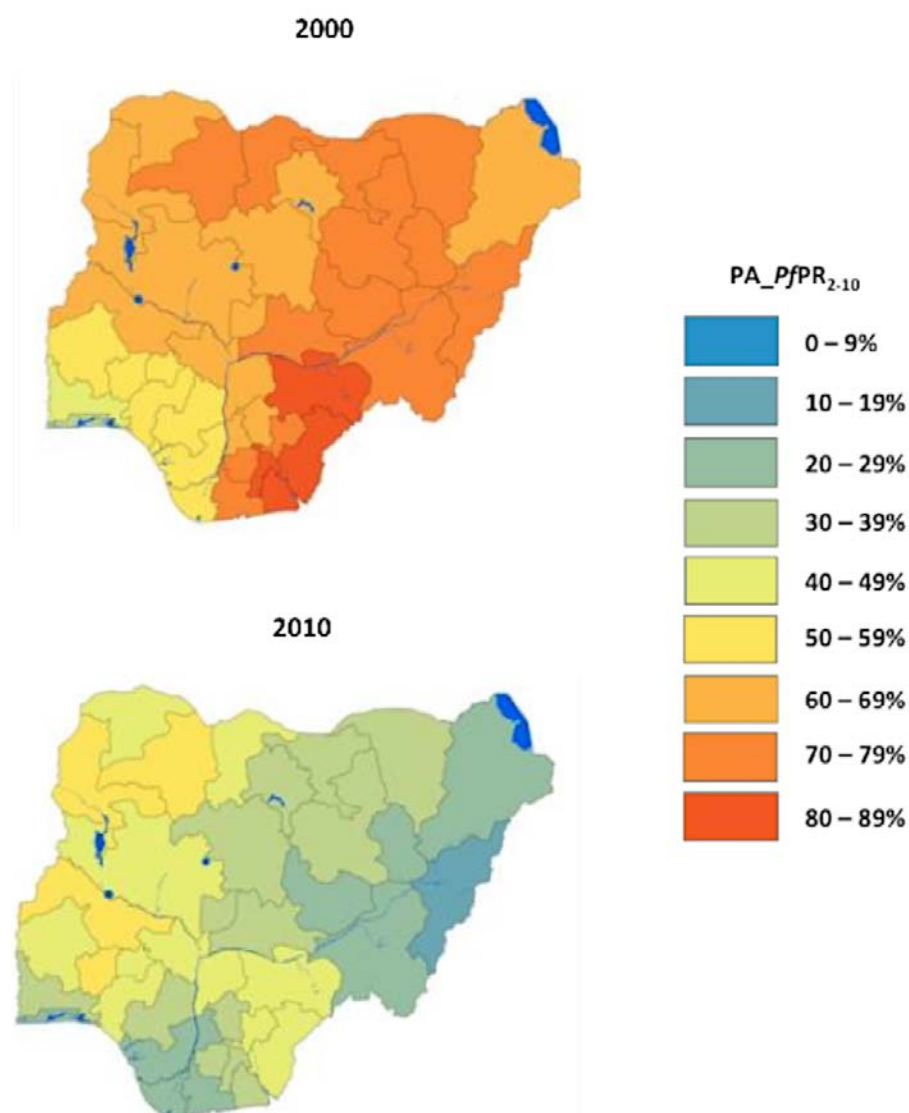
malaria deaths in 2012 worldwide occurred in just 17 countries, with two countries, Nigeria and the Democratic Republic of the Congo (DRC) together accounting for 40% of the estimated global total (WHO, 2013). With almost three times the population of the DRC it is therefore most probable that Nigeria alone contributes 25% to 30% of the global mortality burden of malaria. Locally, malaria causes up to 11% of maternal mortality, 25% of infant mortality, and 20% of under-five mortality.

1.2 Progress with malaria control in Nigeria

1.2.1 Background

Significant progress has been made with reducing morbidity and mortality rates since the inception of the Roll Back Malaria campaign in 2000. Malaria risk as measured by prevalence in children aged 2-10 years showed a progressive decline between 2000 and 2010 (NMCP et al., 2013) as shown in Figure 1.1. These reductions occurred as a result of a major scale-up of vector control interventions, treatment with artemisinin-based combination therapies (ACTs), public health education campaigns, socio-economic factors and more. While the risk of malaria as measured by prevalence in children is high in much of the country, there are some differences between regions with the highest prevalence > 50% seen in four States: Zamfara, Kebbi, Kwara and Osun while prevalence 40-50% seen in 10 States: Sokoto, Katsina, Niger, Oyo, Ekiti, Ondo, Kogi, Benue, Cross Rivers and Ebonyi. These differences can be attributed to variations in intervention coverage, socio-demographic factors, and capacity of the health systems, climate and ecology in the States.

Figure 1.1: Population adjusted mean $PfPR_{2-10}$



1.2.2 Achievements from 2009 to 2013

The previous National Malaria Control Programme Strategic Plan 2009-2013 had the overall goal of scaling up interventions for malaria control to achieve desired impact, and set the stage for progression towards elimination (FMoH, 2008). Achievements during the implementation period by strategic objective are presented.

1.2.3 Integrated Vector Management

Insecticide Treated Nets

Over 66 million long lasting insecticidal nets were distributed over five years from 2009-2013; 60 million through mass campaigns and the remainder through routine maternal and child health clinics and social marketing. The aim was to

achieve universal coverage then defined as 2 nets per household. Household ownership of at least one ITN increased from 8% in 2008 to 50% in 2013. The estimated ownership of 0.7 ± 0.1 ITNs per household, derived from the 2013 NDHS preliminary report (NPC and ICF International, 2013), was lower than the target of 2 per household.

Indoor residual spraying (IRS)

IRS was conducted in selected Local Government Areas (LGAs) in 7 states with support from the World Bank Malaria Booster programme and in 1 state with the United States President's Malaria Initiative (PMI) funding. IRS was also carried out in selected LGAs in Lagos State annually through the State Ministry of Health from 2009. All three IRS programmes targeted around 62,000 households each or approximately 1 million people annually. The coverage per year with was therefore 0.6% against a target of 20%.

Larval source management

Pilot studies on larviciding were carried out in selected areas in six states (Rivers, Nasarawa, Ogun Lagos, Gombe and Jigawa).

1.2.4 Malaria case management

Diagnosis

Parasitological diagnosis for malaria was low (15%) overall but as high as 40% when rapid diagnostic tests were available at the point of care.

Uncomplicated malaria

Artemether-lumefantrine and artesunate-amodiaquine are the first line ACTs used in Nigeria. From 2009 to 2013, availability of ACTs was scaled up in the public as well as private sector through the Affordable Medicines Facility for malaria (AMFm). Access to ACTs as measured in surveys improved between 2009 and 2013. At baseline 33% of children with fever took an antimalarial, 2.4% being an ACT. In 2013, a similar proportion of children with fever took an antimalarial but only 6% took an ACT. Non-recommended antimalarial monotherapies were used more.

Treatment of severe malaria

In 2012, artesunate was adopted as first line treatment for severe malaria to replace quinine and a progressive roll-out commenced in 2013 with UNITAID funding for commodities and training.

Community case management

Little progress was made with regard to implementing malaria community case management due to limitations of policy and guidance on community health services. In 2013, implementation research projects on integrated community

case management were initiated in Niger and Abia States to inform policy and guidance for eventual scale up.

1.2.5 Prevention of Malaria during Pregnancy

The proportion of pregnant women using ITNs increased from 12% in 2008 to 16% in 2013. Proportion of pregnant women using ITNs in households with at least 1 ITN was 30%. Likewise, the proportion of women who received at least two doses of sulphadoxine-pyrimethamine for the intermittent preventive treatment of malaria in pregnancy (IPTp) increased from 5% in 2008 to 15% in the same period.

1.2.6 Procurement and Supply Chain Management (PSCM) for malaria commodities

The PSCM unit developed tools for quantification and logistics management and trained State and LGA supply managers on the logistics system for malaria commodities.

1.2.7 Advocacy Communication and Social Mobilization (ACSM)

A four year National ACSM Strategic Framework and Implementation Plan (ACSM-SF & IP) was developed in June 2010 and was adapted and implemented by sixteen states. Information, education and communication materials on the various interventions were developed and disseminated through print and electronic media. Advocacy kits were developed and successfully used to lobby politicians to allocate resources and deploy more health workers to support malaria control activities in underserved areas.

1.2.8 Monitoring and Evaluation (M&E)

In order to strengthen routine monitoring of malaria data, the NMEP through funding from the Global Fund, the United Kingdom Department for International Development (DFID) and USAID-PMI supported in part, the transition of the national health information system to the web based District Health Information System (DHIS) 2.0 platform. The NMEP also conducted the NMIS in 2010 and post-LLIN distribution net tracking surveys by State. Other surveys conducted include five Monitoring Area Surveys, one Retail Outlet Survey and one Knowledge, Attitudes and Practice Survey. Other national surveys providing malaria information were conducted: the Multi Indicator Cluster Survey (MICS) in 2011 and the National Demographic Health Survey (NDHS) in 2012.

Table 1.1: Summary of achievements in malaria control 2009 – 2013

Objective	Indicator	Baseline 2008	Target 2013	Achievement 2013
Reduce morbidity and mortality due to malaria	All cause under-5 mortality rate per 1,000 live births	176/1000	158/1000	128/1000
To rapidly reduce transmission of malaria to the lowest possible level in the various ecological settings through vector control	% of households with 2 or more ITNs	2.4%	80%	-
	% of households with at least 1 ITN	8%	80%	50%
	% children <5 years sleeping under ITN	5.5%	80%	16.6%
	% pregnant women sleeping under ITN	4.8%	80%	16.5%
	% of households in malaria areas protected by IRS	2%	20%	1.7%
To achieve timely and equitable access to malaria diagnosis and treatment by all sections of the population and as close to the home as possible	% of patients with fever receiving a diagnostic test at health facility	Unknown	80%	39%
	% children <5 years with fever receiving appropriate treatment within 24 hours	1.1%	80%	4.2%
To protect pregnant women and their newborn children from the ill effects of malaria	% pregnant women who receive at least two doses of IPTp	5%	60%	15%

1.3 Challenges

The following is the summary of the key challenges in relation to malaria control in Nigeria

1.3.1 Integrated Vector Management

- Failure to attain universal coverage LLINs due to inadequate number of nets, long distribution period and escalating operational costs.
- Low utilization of LLINs in the general population and in particular among pregnant women and young children
- Lack of resources to scale up IRS

- Inadequate baseline entomological data prior to LLINs and IRS implementation and lack of infrastructure for effective and routine entomological and insecticide resistance monitoring

1.3.2 Diagnosis and Treatment

- Low rates of parasitological diagnosis
- Inequitable access to ACTs particularly in health facilities in rural areas
- Inability to sustain a continuous supply of affordable quality-assured ACTs in the private sector after the AMFm pilot
- Continued use of non-recommended malaria medicines in malaria treatment
- Inadequate trained human resources for case management including integrated community case management (iCCM)
- Lack of malaria treatment guidelines and job aids for health workers
- Weak referral systems militating on quality of care for severe malaria.
- Lack of a framework for the implementation of iCCM and seasonal malaria chemoprophylaxis (SMC)
- Low uptake of pharmacovigilance by health workers
- Irregular monitoring of efficacy of malaria medicines and non-functional malaria sentinel sites.

1.3.3 Malaria in Pregnancy

- Low utilization of antenatal care (ANC) services resulting in low IPTp uptake
- Reported stock-outs of SP used for IPTp

1.3.4 Advocacy Communication and Social Mobilization

- Inadequate number of skilled implementers of ACSM activities
- No operational plans for ACSM activities at State and LGA levels
- Insufficient ACSM materials
- More than half of the States in the country have not implemented actions recommended in the national ACSM strategic framework
- Weak sub-national mechanisms for the coordination of ACSM activities
- Inadequate monitoring and evaluation of ACSM activities
- Lack of local research findings to inform implementation of activities

1.3.5 Procurement and Supply Management System

- Delays in disbursement of funds affecting timely procurement, distribution of commodities
- Persistent stock-outs of medicines at health facility level
- Quantification and distribution of commodities not based on consumption data

- Inadequate storage infrastructure for LLINs and medicines. Poor inventory management and reporting at facility level
- Lack of a comprehensive Logistics Management Information System to track commodities
- Inadequate quality assurance of antimalarials at all levels

1.3.6 Monitoring and Evaluation

- Routine monitoring data affected by low completeness and timeliness of reporting through the Health Management Information System (HMIS)
- Insufficient funding to complete the roll out of the DHIS 2.0 to all health facilities
- Lack of trained personnel for M&E at all levels of reporting
- Continued existence of vertical reporting systems also contributed to quality of routine reporting.

1.4 Lessons learnt and recommendations

1.4.1 Integrated Vector Management

- The distribution of LLINs to achieve universal coverage needs to take place over a shorter time in order that significant coverage is attained and maintained to achieve the desired impact.
- Despite being implemented on a relatively small scale, IRS has demonstrated significant impact in reducing morbidity in areas where it has been implemented. In Ibeju Lekki LGA in Lagos, the number of malaria out-patient cases declined by half in 2012 following IRS implementation.
- Implementation of integrated vector management is limited by scarcity of up to date vector distribution maps. There is need to strengthen vector surveillance and bionomics and map vector distribution and behaviour around the country.
- There are knowledge gaps around larviciding and LLIN efficacy and durability that require operational research studies, in order to inform policy and guide implementation.

1.4.2 Diagnosis and Treatment

- The availability of RDTs improved the testing rates to confirm malaria, but not sufficiently. In addition to ensuring adequate supplies at all levels of care and public education to increase uptake, the scepticism of health workers towards RDT will need to be addressed
- In order to expand access to prompt treatment, there will be need to advocate for policies to guide iCCM, and to mobilize resources to scale up implementation of community case management (including training,

equipping and retaining adequate numbers of volunteer community-based providers)

- In order to ensure availability of quality medicines throughout the supply chain, more will need to be done to strengthen pharmacovigilance and post marketing surveillance system.
- Similarly, with widespread deployment of RDTs, there will be need to leverage existing institutional capacity to establish a quality assurance programme for malaria diagnosis and diagnostics.
- While efforts have been made to improve quality of care for uncomplicated malaria, there is need to improve quality of severe malaria case management through strengthening referral systems, infrastructure for emergency care, and capacity of health workers in secondary health facilities
- In order to monitor progress and performance of implementation of case management activities, there will be need to support surveillance activities at the sentinel sites

1.4.3 Malaria in pregnancy

- The uptake of IPTp is hampered by low and late ANC attendance. There is need to collaborate with maternal health department to explore innovative delivery mechanism for maternal health services including IPTp.

1.4.4 ACSM

- There is need to develop and produce key messages educate the public and promote uptake of interventions, and to disseminate these widely using evidence-based communication channels at all levels of care and at community level.
- Operational research is required to determine factors influencing behaviour that are positive for malaria control, and how these can be enhanced to ensure community participation in interventions to fight malaria
- It is essential to include ACSM activities in State and LGA annual operational plans, to develop appropriate monitoring indicators and to regularly monitor implementation of ASCM activities at all levels.
- With progress towards Malaria Elimination, advocacy and resource mobilization from both local and external partners will be a critical component of ACSM.

1.4.5 Procurement and Supply Management Systems

- Timely availability of quality assured commodities for diagnosis, treatment and communication at all service points is essential for quality of case management.

- Consumption data must be used for the quantification and distribution of commodities to Health Facilities. Reliable data must therefore be obtained from health facilities.
- A strong national supply chain can only be achieved when procurement processes are streamlined, infrastructure for storage of medicines and commodities at facility level are improved and all linked through a functional logistics management information system.

1.4.6 Monitoring and Evaluation

- Epidemiological and risk maps need to be updated regularly to support planning and implementation of activities.
- Integrate malaria into the National Disaster Management Framework and National Contingency Plan of the National Emergency Management Agency (NEMA) and other line Ministries and departments.
- Continue support for one national HMIS as the reference point for all routine malaria data including the development of tools and training to enable the collection of appropriate data.
- Develop and disseminate guidelines for malaria Surveillance and M&E
- Develop national malaria operational research agenda to address knowledge gaps in the implementation of interventions.

1.4.7 Programme Management

- Develop a malaria health financing strategic framework with an intensive advocacy effort to increase financing for malaria interventions both nationally and internationally in line with strategic goals
- Strengthen leadership and governance at national and sub-national levels through capacity building and strengthening where appropriate for effective coordination of malaria interventions.
- Adopt a multi-sectoral approach to malaria control engaging non-health and the private sector in the implementation of malaria control interventions.

2 Implementation Framework 2014-2017

2.1 The National Malaria Elimination Programme

The Government of Nigeria is committed to achieving the goal of elimination of malaria and as such, the Federal Council on Health re-designated the National Malaria Control Programme as National Malaria Elimination Programme (NMEP) to align with the goal. The NMEP is under the National Malaria and Vector Control Division in the Department of Public Health of the Federal Ministry of Health.

2.1.1 Vision

A Malaria Free Nigeria

The Federal Government and the NMEP envision a country that is free of Malaria, enabling wealth creation and sustainable growth that will enable communities effectively fight poverty.

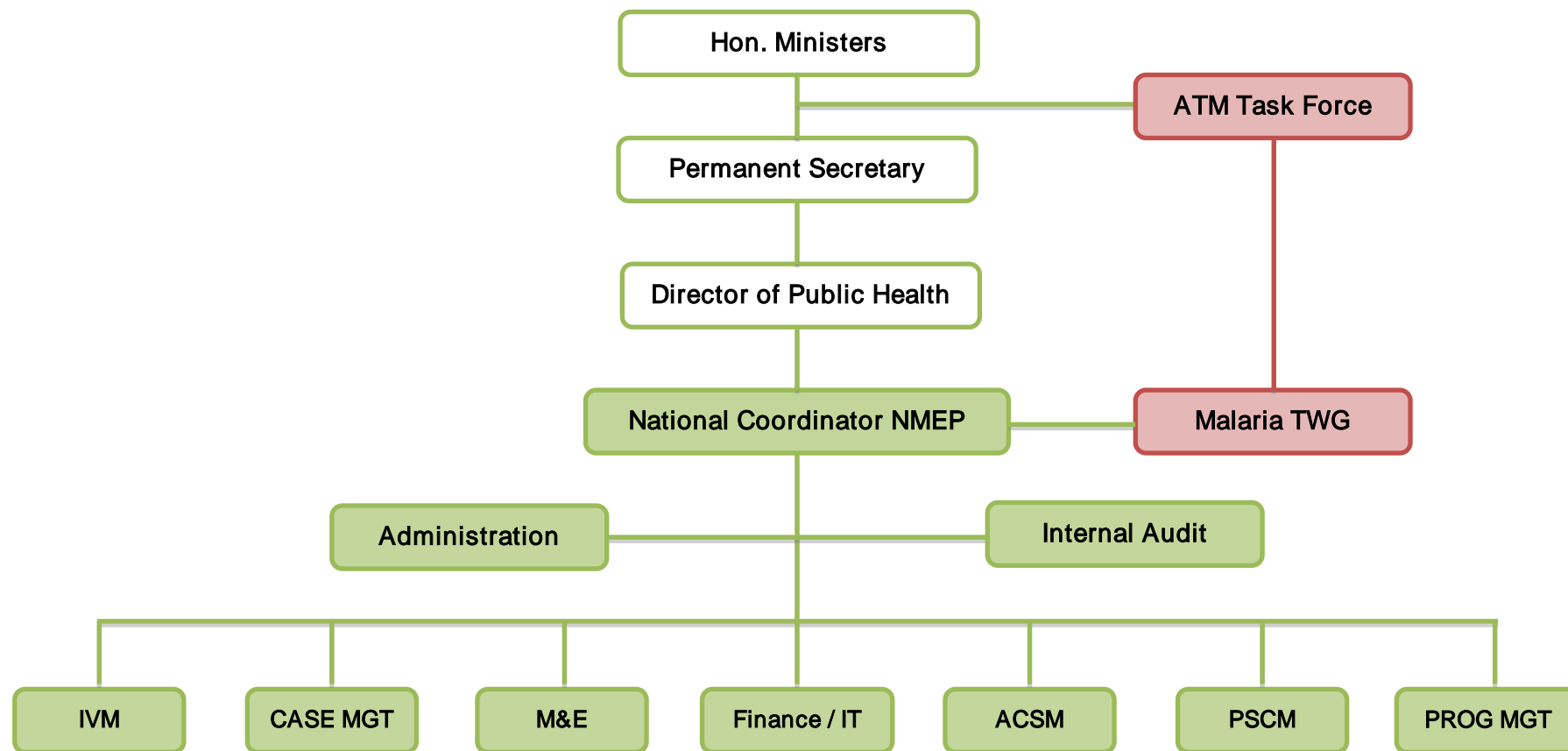
2.1.2 Mission

The NMEP's mission is to provide equitable, comprehensive, cost effective, efficient and quality malaria control services ensuring transparency, accountability, client satisfaction, community ownership and partnership.

2.1.3 Organization

The NMEP consists of seven branches namely programme management, case management, integrated vector management, advocacy communication social mobilization, procurement and supply chain management, monitoring and evaluation and finance and information technology. There are also designated State malaria control programme managers and Local Government Malaria Focal Persons. Figure 2.1 shows the NMEP organization chart.

Figure 2.1 Organizational Chart of the National Malaria Elimination Programme



2.1.4 Responsibilities

The NMEP is mandated to carry out the following:

Normative role: To develop and update policies and guidelines to support the implementation of malaria control interventions.

Strategic direction: To put together evidence based strategies that will guide the country along the malaria control to elimination continuum and to provide technical support for sub-national operational planning and implementation.

Partnerships coordination: To convene the Malaria Technical Working Group, the highest coordination platform for the Malaria Control Partners and other stakeholders at the national level and which reports to the AIDS, Tuberculosis and Malaria (ATM) task force chaired by the Honourable Minister of Health. The NMEP will also participate in the Malaria Partners' Forum incorporating all stakeholders including the private sector. This forum is mandated to provide guidance for implementation of activities, resource mobilization and information dissemination.

Performance monitoring and evaluation: To regularly monitor and evaluate progress, outcomes and impact of implemented strategies.

Advocacy and Resource mobilization: To advocate for political and community support for malaria interventions, to mobilize sufficient resources both locally and internationally to implement strategic plans and to ensure prudent financial management.

2.1.5 Financial Management

The financial management systems at the NMEP are in line with international best practices. The financial practices at the NMEP are drawn from national financial regulations of the Federal Republic of Nigeria. The financial management team of the NMEP is made up of professional accountants, internal and external auditors. Fiduciary control mechanism is in place to ensure transparency and accountability

Revenue

The malaria programme receives its yearly budgetary allocation from the Federal Ministry of Health. Other sources of financing include grants from bilateral and multilateral agencies and soft loans from The World Bank obtained on behalf of Federal Government of Nigeria by the Federal Ministry of Finance and allocated to the NMEP and State Ministries of Health through the Federal Ministry of Health for implementation of activities.

Expenditure

Expenditures are based on approved work plans and budgets. Prior to implementation approval to disburse funds is made and appropriate funds disbursed. The process is in line with the existing internal controls and must be transparent as a requirement of the principles of due process.

Audit Practices

There are two levels of audit in place as a requirement of proven internal control mechanism and financial transparency. They are Internal Auditing and External Auditing.

- **Internal Audit:** Funding allocations from the Federal Ministry of Health and direct donor disbursements are subjected to internal audit by the office of the Auditor-General of the federation through the National Coordinator, NMEP.
- **External Audit:** Government funding allocations and donor funds including non-cash assets are subject to external audit by office of the Auditor-General of the Federation. Any weakness in internal financial management is reported to the National Coordinator and the Honourable Minister for Health. The external audit results in annual audit reports and management letters to address shortcomings. Other donor funds managed by the programme.

2.2 National Malaria Strategic Plan (NMSP) 2014-2020

The Malaria Strategic Plan 2014 – 2020 aims to build on achievements made from 2009–2013 by scaling up high impact interventions to universal coverage in order to accelerate the reduction in malaria morbidity in Nigeria to pre-elimination levels by 2020 (FMoH, 2014). The plan was developed through a participatory approach in line with WHO recommendations. Inputs were obtained from all stakeholders including States and the plan developed to address recommendations arising from the malaria programme performance review conducted in 2013.

2.2.1 Goal

To reduce malaria prevalence to less than 5% and bring malaria related mortality to zero by 2020.

2.2.2 Objectives

1. *To provide at least 80% of targeted population with appropriate preventive measures by 2020:* Through the sustained mass distribution of Long Lasting Insecticidal Nets (LLINs), scaling up Indoor Residual Spraying (IRS) as appropriate and expanding larval source management (larviciding and environmental management). There will also be support for Intermittent Preventive Therapy (IPTp) and Seasonal Malaria Chemoprevention (SMC).
2. *To test all care-seeking persons with suspected malaria using RDT or microscopy by 2020:* This will be through scale-up in diagnostic services for parasitological confirmation (RDT and/or Microscopy) at all levels (including the private sector and community systems) of health care delivery in the country.
3. *To treat all individuals with confirmed malaria seen in private or public facilities with effective anti-malarial drug by 2020:* This will be achieved by promoting availability of appropriate antimalarial medicines through free, subsidized or commercial systems and improving quality of care. Treatment of malaria will be extended to community level using malaria case management as the driver for the integrated community case management (iCCM).
4. *To provide adequate information to all Nigerians such that at least 80% of the populace habitually takes appropriate malaria preventive and treatment measures as necessary by 2020:* Evidence based innovative behavioural change communication messages delivered through multiple platforms and targeting both health workers and the general public will drive the efforts at pursuing the attainment of this objective.

5. *To ensure the timely availability of appropriate antimalarial medicines and commodities required for prevention and treatment of malaria in Nigeria wherever they are needed by 2018:* Forecasting and quantification will be strengthened, while efforts is made to ensure effective and efficient distributions systems that rides on completeness of the logistic management information systems. Partnerships with key government agencies to strengthen and update malaria related regulatory policies and in the conduct of pharmacovigilance will be formed.
6. *At least 80% of health facilities in all LGAs report routinely on malaria 2020:* This will be with stronger emphasis on the use of electronic data capture and the strengthening of reporting through DHIS 2.0 and HMIS. Supervision and coordination activities to enhance completeness of reporting from facilities will be strengthened. Capacity building for monitoring and evaluation will emphasise the special pre-elimination needs in surveillance and reporting.
7. *To strengthen governance and coordination of all stakeholders for effective program implementation towards an "A" rating by 2018 on a standardized scorecard:* Building on the existing gains of the partnership arrangement, programme management will promote human capacity development, ensure public, private partnerships to invest in malaria control and elimination.

2.3 Strategic areas for investment 2014-2017

2.3.1 Malaria Prevention

2.3.1.1 Universal coverage with LLINs

Objective

To attain universal coverage with LLINs (1 net for every 2 people) by 2017 and maintain thereafter

Strategies

1. Ensure universal access to LLINs through free mass distribution campaigns
2. Maintain coverage during inter-campaign years through continuous distribution of nets at ANC and expanded programme on immunization (EPI) clinics, integrated maternal neonatal and child health (MNCH) weeks, school-based distribution, and community distribution including internally displaced persons
3. Distribution through commercial channels to individuals and institutions such as schools, hotels and in-patient facilities

Impact of the intervention

Using the Lives Saved Tool (LiST), the gradual increase in coverage with LLINs to 80% by 2017 will result in an additional reduction in child mortality by 4% per annum reaching 12% in 2017. Between 2014 and 2017, LLINs have the potential of saving 42,000 children under 5 years. The benefits on mortality will continue through 2020 as long as coverage with LLINs is maintained.

Table 2.1 Indicators for Universal Coverage with LLINs

LLIN coverage indicators	Baseline (Year)	2014	2015	2016	2017	Source
% of HH with at least 1 LLINs for two persons	36% (2010)	36%	58%	69%	80%	MIS
% of children <5 who slept under an LLIN the previous night	58.6%* (2010)	60%	70%	80%	90%	MIS
% of HH residents who slept under an LLIN the previous night	49%* (2010)	50%	60%	70%	80%	MIS
% of pregnant women who slept under an LLIN the previous night	65.4%* (2010)	71%	77%	83%	89%	MIS

* In households with at least 1 LLIN/ITN

HH – household, MIS-Malaria Indicator Survey, LLIN-long lasting insecticidal nets

To ensure universal coverage countrywide by the end of 2016, mass distribution of 48.9 million LLINs will take place in 17 States in 2014. A further 48.2 million LLINs for the remaining 20 States, costing US\$ 289 million (NGN 42 billion) to purchase and deliver to end users, will be need to be procured in 2014 and

distributed from 2015 in a rolling campaign. In order to maintain universal coverage, replacement of LLINs distributed from 2014 will take place in another round of rolling mass campaigns beginning in 2017. The first batch of 42.7 million LLINs costing US\$ 278 million (NGN 37 billion) will need to be procured in 2016 to ensure timely distribution from 2017.

The distribution of nets through mass campaigns remains critical for attainment and maintenance of universal coverage. The first mass campaign distributing 64 million nets took place over five years from 2009 to 2013, and as such did not attain the critical coverage expected. The NMEP aims to speed up distribution of mass campaign nets to complete the rolling campaign commenced in 2014 within 36 months. In order to achieve this, the cooperation of donors (to avail funds in a timely manner), manufacturing agencies (to ensure sufficient manufacturing capacity to meet Nigeria's need in time), and active participation of Federal and State government officials (to ensure efficient planning, and distribution) will be required.

Routine distribution to pregnant women and infants will take place annually through child immunization clinics and antenatal clinics and will achieve two purposes: 1) maintaining coverage of growing population and 2) coverage of vulnerable pregnant women and young children. Continuous distribution will target schools and specific communities. The annual requirement for LLINs for mass campaigns and routine/continuous distribution is shown in table 2.2.

Table 2.2: LLIN requirements and budget

LLIN Requirements	2014	2015	2016	2017
Mass distribution campaigns	38,867,558	29,150,668	29,150,668	42,719,518
Routine distribution to pregnant women (ANC clinics)	5,334,572	6,407,783	7,544,217	8,746,821
Routine distribution to infants (EPI clinics)	4,197,696	5,054,026	5,960,863	6,536,086
Continuous distribution through community channels/schools	5,247,120	5,415,028	5,588,309	5,767,135
Total Annual LLIN need	53,646,946	46,027,505	48,244,057	63,769,560
Nets available from government and partners	48,917,889	6,656,711	1,556,711	1,556,711
Annual LLIN Gap	4,729,057	39,370,794	46,687,346	62,212,849
Annual funding need (US \$)	27,428,531	228,350,605	270,786,607	360,834,524

2.3.1.2 Indoor Residual Spraying (IRS)

Objective

To scale up indoor residual spraying to 30% of households in Nigeria by 2017 to interrupt malaria transmission

Strategies

1. Selection of suitable Local Government Areas (LGAs) within states for IRS by presence of predominance of endophilic and endophagic vectors, risk of malaria epidemics, short intense transmission season and or high malaria prevalence
2. Selection of appropriate insecticide based on insecticide susceptibility studies.
3. Capacity building for IRS (planning, micro-planning, quantification of supplies, implementation, routine monitoring and evaluation) within States implementing IRS.

Table 2.3 IRS Indicators

Indicators for IRS coverage	Baseline (Year)	2014	2015	2016	2017	Source
% of households reached with IRS	<1% (2010)	5%	10%	20%	30%	MIS

IRS will be used to reduce disease burden and interrupt malaria transmission in selected areas and will be used alone in areas with low coverage and use of LLINs or in combination with LLINs in selected areas with high malaria burden. IRS will be gradually scaled up to 30% of households in 2017. The average cost of protection per household for two cycles of IRS per year is NGN 1,860 (US\$12.4). The total cost required to implement IRS in 2014 is NGN 6.6 billion (US\$ 44 million) increasing annually to NGN 41.4 billion in 2017 (US\$ 276.6 million).

Table 2.4 IRS requirements and budget

IRS Needs	2014	2015	2016	2016
Proportion of population targeted for IRS	5%	10%	20%	30%
Population to be protected	8,745,201	18,050,094	37,255,394	57,671,350
Number of households to be covered per cycle	1,749,040	3,610,019	7,451,079	11,534,270
Number of spray cycles	2	2	2	2
Total Number of households per year	3,498,080	7,220,038	14,902,158	23,068,540
Number of households already funded	80,918	80,918	80,918	-
IRS gap (households)	3,417,162	7,139,120	14,821,240	23,068,540
Financial gap US\$	44,152,311	87,685,559	181,803,067	276,697,227

2.3.1.3 Larval Source Management (LSM)

Objective

To scale up implementation of larviciding as part of integrated vector management to 80% of targeted areas by 2016

Strategies

1. Identification and mapping of malaria vector breeding sites: Local communities will be involved in the identification of malaria vector breeding sites and selection of sites appropriate for environmental management and or larviciding to stop vector breeding.
2. Selection of larvicides: Selection of larvicides when appropriate will be based on susceptibility status of the local vector, safety, environmental safety as well as cost effectiveness.
3. Capacity building for larval source management: At LGA level for the identification, classification, planning of LSM interventions, quantification of commodities, implementation, monitoring and evaluation.

Table 2.5: Indicators for larval source management

Indicators for LSM	Baseline (Year)	2014	2015	2016	2017	Source
% of mapped mosquito breeding sites sprayed with larvicides annually	0 (2010)	50%	60%	80%	80%	Activity Reports

LSM is a supplemental strategy for vector control. Environmental management to minimize vector breeding will be advocated and employed to mitigate health risks in collaboration with Federal and State Environmental Agencies, Ministry of Water Resources and Ministry of Agriculture. Pilot projects on larviciding were carried out in six States and demonstrated feasibility of implementation. Larviciding will be implemented concurrently with LLINs and or IRS to reduce the density of both indoor and outdoor malaria vectors.

Central to implementation of LSM will be the development of national guidelines in line with WHO recommendations to guide the identification and mapping of breeding sites and intervention implementation at State and LGA levels. The total cost for larviciding as a component of LSM is about NGN 330 million (US\$ 2.2 million) annually. The budget details are shown in table 2.6.

Table 2.6: LSM requirements and budget

LSM Needs	2014	2015	2016	2017
Develop, print and distribute and disseminate national guidelines for LSM	88,384	-	-	-
Build human resource capacity for LSM implementation	278,940	278,940	278,940	278,940
Identify and map malaria breeding sites countrywide	199,244	199,244	199,244	199,244
Select, procure and distribute insecticides for LSM	91,800	91,800	91,800	91,800
Conduct weekly larviciding at targeted breeding sites in 12 States	1,600,200	1,600,200	1,600,200	1,600,200
Total Funding Gap (US\$)	2,258,568	2,170,184	2,170,184	2,170,184

2.3.1.4 Prevention of malaria in pregnancy

Objective

To have at least 95% of pregnant women attending antenatal care receive at least three doses of intermittent preventive treatment (IPTp) with sulphadoxine-pyrimethamine (SP) by 2017

Strategies

1. Review and disseminate guidelines for prevention of malaria in pregnancy: To ensure health workers at all levels of health care are informed about prevention and treatment strategies of malaria in pregnancy.
2. Promote directly observed treatment (DOT) for IPTp: SP should be given as DOT at antenatal clinics to ensure compliance with therapy
3. IPTp will be implemented as part of the reproductive health service.

4. Promotion of uptake of antenatal care services will enable uptake of IPTp among other maternal health care services

Impact of the intervention

IPTp, LLIN use and appropriate case management together have the potential to reduce malaria specific maternal mortality by 41% by 2017, assuming 1) ANC attendance rate increases to 71% and at least 90% of women receive 2 or more doses of IPTp, and 3) that women with uncomplicated malaria receive prompt treatment with ACTs.

Table 2.7: Indicators for IPTp

Indicator	Baseline (Year)	2014	2015	2016	2017	Source
Proportion of pregnant women attending ANC	61% (2013)	61%	63%	67%	71%	DHS
% of pregnant women who received at least 2 doses of IPTp	17% (2010)	35%	55%	75%	95%	MIS
Proportion of ANC facilities with no stock out of SP in the last 3 months	-	95%	95%	95%	95%	LMIS

IPTp is the presumptive administration of full therapeutic course of antimalarial medicine to pregnant women during routine antenatal care visits. IPTp has been shown to reduce the incidence of malaria in pregnant women, reduce maternal and foetal anaemia, placental infection with malaria parasites and the incidence of low birth weight, which in turn reduces neonatal mortality. SP is used in Nigeria and malaria endemic countries for IPTp. IPTp is one of the key strategies including use of LLINs and prompt diagnosis and treatment, adopted to reduce maternal and neonatal mortality due to malaria.

Uptake of IPTp has in the past been hampered by low and late ANC attendance and stock outs of SP at health facilities. Sufficient quantities of SP will be procured to match increasing ANC attendance. In collaboration with the Reproductive Health Department of the Ministry of Health, public education campaigns will be conducted to promote uptake of ANC in order to protect both mother and child from the effects of malaria will be conducted. Community owned resource persons (CORPS) will be trained on maternal health and IPTp in order to provide health education and refer/encourage pregnant women to attend ANC early to receive LLINs and to attend frequently to receive IPTp. Capacity building for health facility health workers to provide focused antenatal care including services for malaria in pregnancy will also be carried out. Appropriate IPTp messages and materials will be developed and disseminated as part of the integrated malaria advocacy and behaviour change

communications campaigns. The costs of delivery of IPTp are shown in table 2.8.

Table 2.8: Requirements and budget for IPTp

IPTp Needs	2014	2015	2016	2017
Procure and distribute SP for IPTp	4,619,630	8,719,870	13,999,578	20,559,539
Review, update, print and disseminate IPTp guidelines	285,697	0	0	0
Print and disseminate Focused Antenatal Care (FANC) Manuals	134,000	0	0	0
Train MCH health workers on prevention and treatment of MIP	1,358,515	2,216,090	123,080	57,960
Build capacity of 25,000 community level health workers on IPTp	1,200,000	1,200,000	1,800,000	1,800,000
Total Gap in US\$	7,597,842	12,135,960	15,922,658	22,417,499

2.3.1.5 Seasonal Malaria Chemoprophylaxis

SMC involves administration of three or four monthly treatment courses of malaria during the high malaria transmission season in areas where malaria transmission is highly seasonal. SMC was adopted in 2013 as a strategy to reduce the burden of malaria in Sahelian states.

Objective

To provide seasonal malaria chemoprophylaxis to eligible children under five annually in nine Northern States within the Sahel belt

Strategies

1. Develop guidelines and implementation manuals: Develop and disseminate national guidelines, training manuals and job aids for SMC implementation.
2. Procure and distribute commodities for SMC: Procure pre-packaged (or repackage) drugs recommended for SMC namely sulphadoxine-pyrimethamine (SP) plus amodiaquine (AQ) for distribution to the target population (under-five children in nine States located in the Sahel).
3. Capacity building for implementation of SMC: Train Health workers on SMC implementation (including diagnostics, treatment, pharmacovigilance, and logistics management). Perform a comprehensive desk review and mapping of areas and target populations to provide the necessary evidence for planning and implementation of SMC.

4. Advocacy and Community Mobilization: Conduct advocacy, stakeholder engagement and sensitization at State, LGA and community levels to promote uptake of SMC
5. Pharmacovigilance: Integrate pharmacovigilance on the SMC medicines into existing adverse event reporting system.
6. Operations Research: Identify and commission research to inform decisions and actions to improve on the efficiency and effectiveness of the SMC strategy.

Impact of the intervention

Where implemented, SMC has been shown to reduce the malaria burden in young children by 75%.

Table 2.9: Indicators for SMC

SMC Indicator	Baseline (Year)	2014	2015	2016	2017	Source
Proportion of children who received 1, 2 and 3 courses during the transmission season	10% (2013)	10%	20%	30%	40%	Activity Reports

SMC is in 2014 implemented in Katsina and parts of Jigawa States with support from DFID and Clinton Health Access Initiative (CHAI), covering about 1 million eligible children. This is 10% coverage of eligible children in the Sahel. The NMEP aims to gradually scale up the implementation of SMC to 40% coverage by 2017. It costs approximately NGN 650 (US\$ 4.33) to deliver SMC per child per year. The estimated funding gaps in delivery of SMC are shown in table 2.10.

Table 2.10: Requirements and budget for SMC

	2014	2015	2016	2017
Number of Children under 5	10,725,200	11,068,372	11,422,563	11,788,128
Eligible children 3 months to 5 years	10,188,940	10,514,954	10,851,435	11,198,721
Target coverage per year	10%	20%	30%	40%
Number of children 3 - 59 months targeted	1,018,894	2,102,991	3,255,431	4,479,489
Number of SP-AQ doses required per	4,075,576	8,411,963	13,021,722	17,917,954
SP-AQ doses required per year (incl. 15% buffer)	4,686,912	9,673,758	14,974,980	20,605,647
SP-AQ delivery per annual round	1,171,728	2,418,439	3,743,745	5,151,412
Cost of delivery of SMC per annual round	5,061,865	10,447,658	16,172,979	22,254,099
Available Funding US \$	4,968,000	4,968,000	-	-
Funding Gap US \$	93,865	5,479,658	16,172,979	22,254,099

2.3.2 Malaria Case Management

Case management forms a critical part of the current interventions in controlling malaria. At the core of this objective is the treatment of all individuals with confirmed malaria seen in both private and public health facilities, and at community level with effective anti-malarial drug by 2020. To achieve this target, diagnostic facilities and antimalarial medicines must be available through free, subsidized or commercial systems at all levels of health care in both sectors.

2.3.2.1 Diagnosis

Objective: To test all care-seeking persons with suspected malaria using RDT or microscopy by 2020

Strategies

1. Update policies and guidelines for universal parasitological diagnosis in order to provide evidence to enable regulatory support for the use of rapid diagnostic tests at community level by both CORPs and proprietary patent medicine vendors (PPMVs) in the private sector.
2. Ensure availability and access to equipment and supplies for parasitological diagnosis by mobilizing resources to ensure sufficient supplies for microscopy and quantity of RDTs, and efficient delivery to all points of care.
3. Create demand for diagnosis through advocacy and education of the general public, patients and health workers. Confirmation of diagnosis before treatment is a paradigm shift that will require intense advocacy and education to engender behaviour change and acceptance of testing.
4. Build Capacity of health workers at all levels of care including community providers to perform malaria diagnosis using RDTs. Laboratory technologists will also receive refresher training on malaria microscopy.
5. Establish quality assurance for diagnostics to ensure consistent, timely, reliable and accurate results are achieved at all levels of care. Quality assurance centres will be established in each State.
6. Operational research to address implementation bottlenecks including challenges with uptake, adherence to test results and quality assurance in collaboration with Nigerian institutions.

Table 2.11: Indicators for malaria diagnosis

Malaria Diagnosis Indicators	Baseline (Year)	2014	2015	2016	2017	Source
% of persons with suspected malaria receiving a diagnostic test (RDT and/or microscopy)	22% (2012)	40%	50%	60%	70%	HMIS
% of health facilities with malaria diagnostic capabilities (microscopy and/or RDT)	-	50%	60%	70%	80%	HMIS/LMIS

Parasitological confirmation of malaria using microscopy or rapid diagnostic tests (RDTs) is advocated by the FMOH for all suspected cases, in line with WHO recommendations. There are advantages to confirming a diagnosis of malaria including:

1. Improved care for those infected with malaria
2. Provision of appropriate care for fevers that are not malaria
3. Prevention of irrational use of expensive antimalarials
4. Proper documentation of actual malaria cases, which can be used to monitor impact of interventions.
5. Progress to malaria elimination will only be determined through impact on parasitologically confirmed malaria.

The NMEP and partners aim to scale up access to parasitological diagnosis of malaria to all persons at all service delivery levels in both public and private sector. More than 90% of expenditure on diagnostics will be used to procure and distribute RDTs.

Table 2.12: Requirements and budget for malaria diagnosis

Malaria Diagnosis	2014	2015	2016	2017
Commodity Requirements				
RDTs	88,291,804	137,557,112	171,188,534	194,333,224
Microscopes	2,660	2,662	2,662	-
Funding need				
Cost of RDTs (US \$)	88,291,804	137,557,112	171,188,534	194,333,224
Cost of Microscopes	6,384,000	6,388,800	6,388,800	-
Costs of training on Microscopy	1,721,563	3,283,067	3,283,067	-
Establishment of QA Centres	612,833	3,653,610	764,660	579,660
Operational Research	30,800	290,980	173,360	4,000
Funding gap US \$	97,041,000	151,173,569	181,798,421	194,916,884

2.3.2.2 Malaria Treatment

Objective

To treat all confirmed malaria cases seen in private or public facilities with effective antimalarials

Strategies

1. Ensure access to effective treatment through the procurement and distribution of sufficient quantities of ACTs through the public health system. To support initiatives to subsidize quality assured ACTs in the private sector to ensure equitable access.
2. Treatment of uncomplicated malaria with ACT: Training of health workers, public education, availability of ACTs and removal of non-

recommended treatments will support uptake of ACTs for treatment of malaria and for better treatment outcomes and to prevent progression to severe malaria.

3. Management of severe malaria: The main focus will be to train health workers on management of severe malaria and appropriate referral practices where care cannot be provided.

Impact of the intervention

Prompt and effective treatment of malaria directly prevents mortality. Interventions to increase access to prompt treatment for malaria for vulnerable groups are great value for money spent. Using the LiST model, assuming 90% of children with fever receive prompt diagnosis and those with malaria receive ACTs will result in a significant 75% reduction in malaria specific child mortality. This translates to over 137,000 lives saved annually from 2017.

Table 2.13: Indicators for malaria treatment

Malaria Treatment Indicators	Baseline (Year)	2014	2015	2016	2017	Source
% of persons testing positive that receive antimalarial treatment (in public and private health facilities) according to national guidelines	42% (2012)	55%	70%	85%	100%	HMIS
% of Children younger than 5 years of age with fever in the last 2 weeks who received any antimalarial treatment	49% (2010)	60%	70%	80%	90%	MIS

Prompt and effective treatment for malaria is life-saving. Ensuring access to ACTs at all levels of the health system will enhance prompt treatment and reduce mortality. In addition to the provision of effective antimalarials, ensuring quality of care for both uncomplicated and severe malaria is essential. To this end, about 77,400 frontline health workers will receive refresher training in malaria case management. Emphasis will be made on the recognition and appropriate management of severe malaria at community and primary health care level (pre-referral treatment and referral) and at secondary and tertiary care (treatment).

Table 2.14: Requirements and budget for malaria treatment

Malaria Treatment	2014	2015	2016	2017
Commodity Requirements				
ACTs	37,153,269	96,149,077	101,474,293	100,833,936
Injection Artesunate	12,747,326	15,579,557	16,021,912	15,643,411
Rectal Artesunate	240,657	295,298	307,126	300,817
Funding Needs				
Procurement and distribution of medicines	54,694,724	127,592,040	134,305,054	133,261,833
Training of Health Workers	999,398	169,507,291	310,574,102	1,172,509
Funding gap in US\$	55,694,122	297,099,331	444,879,156	134,434,342

2.3.2.3 Integrated community case management (iCCM) of childhood illnesses

Objective

To increase access to malaria diagnosis and treatment by children under five at community level through iCCM.

Strategies

1. Commodity security: Ensure steady supply of RDTs, ACTs and rectal artesunate for malaria case management at community level
2. Capacity building for CORPS and PPMVs to recognize test and treat uncomplicated malaria, and other illnesses, and prompt referral for severely ill children.
3. Demand creation: Create awareness and demand for iCCM services, and benefits of prompt and appropriate treatment through community advocacy and mobilization strategies.
4. Partnerships and coordination: In conjunction with National Primary Health Care Development Agency (NPHCDA) and partners to map priority areas for iCCM implementation, resource needs, infrastructure set up and monitoring and evaluation.

Table 2.15: Indicators for iCCM

Indicator for community case management	Baseline (Year)	2014	2015	2016	2017	Source
% of children <5 years of age with fever in the last 2 weeks who received appropriate treatment	49% (2010)	60%	70%	80%	90%	MIS

Community case management for malaria is implemented countrywide through volunteer role model caregivers (RMCs). In order to tackle other causes of child mortality in Nigeria, community case management of malaria will be used as a backbone to scale up implementation of iCCM. iCCM is an equity-focused strategy which complements and further extends the reach of public health services by promoting timely and effective treatment of malaria, pneumonia and diarrhoea to populations residing in areas with limited access to facility-based health care providers. As part of iCCM, front-line workers at the community level are trained, supplied and supervised to diagnose suspected malaria cases using RDTs and treat children for malaria, pneumonia and diarrhoea, using ACTs, oral antibiotics, oral rehydration salts and zinc.

The NMEP in collaboration with the NPHCDA and other partners working at the community level will scale up management on malaria at community level using the iCCM platform. iCCM is already implemented in pilots projects in two states – Niger and Abia with support from the Rapid Access Expansion 2015 (RACe) project. Scale up is planned for two additional high burden malaria states – Kebbi and Adamawa with support from UNICEF.

Table 2.16: Requirements and budget for community case management and iCCM

CCM & iCCM Requirements	2014	2015	2016	2017
Training and refresher training of CORPS and PPMVs on iCCM	-	176,211	66,152	66,152
Training of RMCs and PPMVs on CCM for malaria in 33 States	-	2,334,336	5,762,329	2361207
Supportive supervision in 36 States plus FCT	7,232,389	7,232,389	7,232,389	7,232,389
Management and coordination meetings (PHC and LGA)	257,250	500,010	500,010	500,010
iCCM Start up kits (2 States)	-	246,743	-	-
Operations research	-	100,000	100,000	-
Funding gap in US\$	7,489,639	12,394,727	15,111,903	11,510,781

2.3.3 Advocacy communication and social mobilization (ACSM)

Objective

To provide adequate information to all Nigerians such that at least 80% of the populace habitually take appropriate malaria preventive and treatment measures as necessary by 2020

Strategies

1. Mass media – use of electronic and print media to inform and educate communities, to foster positive health behaviours and uptake of control interventions.
2. Interpersonal communication – use of interpersonal communication and counselling (IPCC) at community level and at health facility level to reinforce mass media messaging.
3. Advocacy for political and community support for malaria – through provision of financial and material resources and commitment needed by both political leaders, stakeholders and communities to move towards malaria elimination
4. Coordination, monitoring and evaluation of ASCM activities – among partners and stakeholders and at all levels of implementation

Table 2.17: Indicators for ACSM

ACSM Indicators	Baseline (Year)	2014	2015	2016	2017	Source
% women aged 15-49 reached with mass media activities about malaria prevention and control in the four weeks preceding the survey	30% (2010)	40%	50%	60%	70%	MIS
% of women aged 15 -49 years with knowledge of the preventive measures for malaria	92% (2010)	100%	100%	100%	100%	MIS

ACSM is a major component of all the interventions and it is meant to foster positive health seeking behaviour in the population at risk of malaria. The proposed strategy is to develop and transmit very clear messages directed to specific target audience through various means including community outreach programmes and electronic and print media directed towards households and individuals. ACSM activities will mainly target:

- LLIN use
- Behaviour change and demand for parasitological diagnosis before treatment
- Prompt diagnosis and treatment of febrile illness
- Awareness creation and demand for SMC and iCCM as appropriate
- Community mobilization to increase uptake of IPTp through ANC services

By the end of 2013, only 16 states of the federation had adapted the national malaria ACSM strategic framework and implementation plan to their specific needs. In each of the 16 states, stakeholders in malaria communication have formed an ACSM Core Group that is responsible for planning, implementing and evaluating State-based ACSM activities. It is therefore important that the 21 states remaining follow the lead of the initial 16 states so as to achieve a much wider impact with ACSM activities.

Table 2.18: ACSM budget

ACSM	2014	2015	2016	2017
Mass Media Communication	863,435	745,061	745,061	745,061
Community Mobilization	2,106,230	2,231,625	1,808,375	2,231,625
IPCC by Health Workers	26,955	439,920	435,460	435,460
Advocacy and Malaria Day Activities	261,705	290,875	303,875	290,875
ACSM Coordination at all levels	197,452	149,260	177,260	149,260
Health Seeking Behaviour Survey	-	1,570,000	-	-
Funding gap in US\$	3,455,777	5,426,741	3,470,031	3,852,281

2.3.4 Surveillance Monitoring and Evaluation

Improved surveillance and evaluation in countries with higher malaria burdens is essential for the impact of malaria investments to be properly assessed. *GMAP 2010-2015*

Investments are required in the areas of information management; routine monitoring, measuring for outcome and impact and operational research in order to attain the projected M&E objectives and better manage resources. With the goal of attaining pre-elimination, there is need to enlarge the role of M&E for malaria through strengthening disease surveillance at the sentinel sites and building operational research capacity

Objective

At least 80% of health facilities in all LGAs report routinely on malaria by 2020, progress is measured, and evidence is used for programme improvement

Strategies

- 1. Routine Monitoring:** This activity seeks to establish if inputs (resources invested), processes (activities undertaken and their quality) and outputs (direct deliverables) are proceeding according to plan. The NMEP and partners will support strengthening of routine data generation and flow from public/private facilities and community-based health providers for the national health management information system (HMIS). Specifically, the NMEP will contribute to harmonization of tools; roll out of DHIS 2.0 to primary care facilities; training of health workers and M&E officers at State, LGA and community level; supportive supervision and data quality audits.
- 2. Surveillance:** The NMEP will set up sentinel surveillance sites for routine monitoring and evaluation of malaria interventions. The sentinel sites with more enhanced surveillance systems will enable the programme achieve better observations to ascertain what specific interventions to deploy to different areas of the country. Of major concern are:
 - **Vector Surveillance and Insecticide Resistance Monitoring:** In order to improve the coordination of vector surveillance and insecticide resistance monitoring, capacity building for entomology and vector surveillance will be undertaken. Vector surveillance sites will be set up in each geopolitical zone to monitor impact of vector control interventions. Subsequently, vector surveillance sites will be set up in each State.
 - **Drug Therapeutic Efficacy Testing:** In line with WHO recommendations, therapeutic efficacy testing and artemisinin resistance monitoring will be carried out at 8 sites in the country every two years.
 - **Pharmacovigilance of antimalarials:** In collaboration with the National Agency for Food and Drug Administration and Control

(NAFDAC), the NMEP and partners will train health workers at all levels on pharmacovigilance. Data from sentinel sites together with routinely reported pharmacovigilance data will be used to develop policies on the use of antimalarials.

3. **Evaluation:** Program evaluations/reviews will be conducted to measure programmatic outcomes and impacts. The Nigeria Demographic and Health Survey data will be used to evaluate impact indicators such as child and maternal mortality. The NMEP in collaboration with the National Population Council and partners will conduct at specific intervals the following assessments to evaluate interventions:
 - Malaria Indicator Survey (MIS)
 - Health Facility Survey
 - Rapid Impact Assessment
4. **Operational Research:** The NMEP and stakeholders will develop an Operational Research (OR) agenda for malaria. Operational research will be required to address knowledge gaps and shape policy and strategic direction. The areas of research cut across all thematic areas.

Table 2.19: Indicators for Surveillance, M&E

SM&E Indicators	Baseline (Year)	2014	2015	2016	2017	Source
% of health facilities using the revised DHIS data collection	-	70%	75%	80%	85%	HMIS
% of LGAs reporting malaria data through the DHIS	-	70%	80%	90%	100%	HMIS
% Completeness of facility reporting into the National HMIS	44% (2012)	60%	70%	80%	90%	HMIS

Table 2.20: Budget for Surveillance and M&E

SM&E Budget	2014	2015	2016	2017
Strengthen routine NHMIS reporting system	540,776	537,910	108,845	7,000
Build capacity for Aids TB and Malaria M&E at State and LGA level	20,840	66,732	14,490	14,490
Strengthen routine monitoring & supervision	400,909	387,904	387,904	387,904
Strengthen capacity for pharmacovigilance	243,470	122,960	32,500	32,500
Implement malaria sentinel surveillance and conduct biennial drug efficacy tests	322,921	1,159,690	743,421	608,650
Conduct vector sentinel surveillance and resistance monitoring	195,167	323,392	86,352	86,352
Support monitoring activities at disease and vector surveillance sites	93,548	53,024	53,024	53,024
Conduct regular Data Quality Audits	414,024	800,024	321,384	321,384
Conduct Programme Evaluations	1,697,330	133,000	1,092,890	287,984
Conduct Operations Research to inform malaria programming	65,981	431,070	131,070	431,070
Coordination for M&E at national and sub-national levels	403,311	352,745	253,745	253,745
Funding gap in US\$	4,398,277	4,368,451	3,225,625	2,484,103

2.3.5 Procurement and Supply Chain Management (PSCM)

Objective

To ensure the timely availability of appropriate commodities required for prevention and treatment of malaria

Strategies

1. Quantification, forecasting and procurement: To improve quantification and forecasting to allow for efficient procurement and delivery of all malaria commodities
2. Supply chain management: Upgrade intra-state warehousing and improve distribution of commodities through inventory management and to minimize stock-outs.
3. Increase access to affordable, quality assured malaria commodities in the private sector by providing incentives to ensure affordability
4. Logistics information management: Strengthen reporting of consumption data through the Integration of the logistics management information system (LMIS) for antimalarial medicines and commodities with the National HMIS reporting system (DHIS 2.0).

Table 2.21: Indicators for PSCM

PSCM Indicators	Baseline (Year)	2014	2015	2016	2017	Source
% of health facilities reporting stock-outs of RDTs lasting more than 1 week at any time during the past 3 months		<40 %	<35 %	<30 %	<25 %	LMIS Data
% of health facilities with stock-out of ACTs lasting more than 1 week at any time during the past 3 months	-	<40 %	<35 %	<30 %	<25 %	LMIS Data
% of product batches tested in previous year that met national and International Control Standards	-	80%	80%	80%	90%	LMIS Data

In order to improve access to life saving interventions, the NMEP will strengthen procurement and supply management of malaria commodities. The objective is to ensure availability of malaria commodities. To achieve this, the NMEP will support States to quantify and forecast commodity requirements for malaria control to ensure timely procurement. The NMEP will also work with States to ensure efficient distribution of commodities from State level warehouses to health facilities to minimize stock-outs at points of care. The LMIS will also be strengthened and integrated into the DHIS 2.0 to collect timely consumption data. Since 60% of malaria case management takes place in the private sector

the NMEP will also provide incentives to continue the provision of affordable quality assured ACTs.

Table 2.22: PSCM Budget

PSCM Budget	2014	2015	2016	2017
Strengthen quantification, forecasting and procurement	302,030	302,030	302,030	302,030
Strengthen storage and distribution systems for malaria commodities	739,337	662,482	630,007	630,007
Strengthen LMIS	120,642	695,108	610,124	610,124
Quality assurance and pharmacovigilance	138,400	123,910	94,390	94,930
Support ACT subsidy in the private sector	68,252	68,252	68,252	68,252
Support regulatory monitoring of private sector	-	116,460	-	-
Funding gap in US\$	1,368,661	1,968,242	1,705,343	1,705,343

2.3.6 Programme Management

Objective

To strengthen governance and coordination of all stakeholders for effective programme implementation towards an 'A' rating by 2017 that is sustained through to 2020 on a standardized scorecard

Strategies

1. **Strengthen programme management and coordination at sub-national levels:** Support human resource development for malaria programme planning, budgeting, monitoring and supervision at sub-national levels.
2. **Partnership co-ordination:** Mapping of stakeholders and coordination of partners at national and sub-national levels through relevant working groups and in the spirit of the 'three ones', to achieve efficient and effective programme implementation.
3. **Resource mobilization and financial management:** Development of a resource mobilisation and financial management strategy that clearly maps the available resources, projects anticipated resources, improve public and private sector resourcing,
4. **Annual operational planning and performance monitoring:** Strengthen joint annual operational planning and performance monitoring with all partners, donors, implementers, and government at national and state levels Indicators

Table 2.23: Indicators for management and coordination

Management and Coordination Indicators	Baseline (Year)	2014	2015	2016	2017	Source
Proportion of states that have adapted the National Coordination framework		30%	40%	50%	70%	NMP reports
Proportion of government contribution to total annual expenditure for Malaria Elimination		20%	30%	30%	40%	National Health Account
Number of Malaria Programme Review conducted	1 (2012)	-	-	1	-	MPR reports

The NMEP will provide the very important steps and strategies required by the different stakeholders to take responsibility for planning, supervision, resource mobilization, capacity development and other management arrangements for effective utilization of resources to achieve the programme goals and objectives. Central to this is coordination of actions at all levels. With the country target for malaria focused on pre-elimination, institutional strengthening for monitoring and effective surveillance will be prioritized. Additionally, strategic advocacy visits for

resource mobilization and key policy issues that will result in the creation of an enabling environment for programme implementation must be embarked upon. In general, the NMEP will ensure that malaria control and pre-elimination efforts are linked to the existing health sector structures at national and sub-national levels as part of an integrated national health system.

Table 2.24: Programme management and coordination budget

Programme management and coordination	2014	2015	2016	2017
Strengthen programme management and coordination at national & sub-national	1,549,278	1,003,684	932,264	1,130,314
Strengthen private sector partnerships	52,190	14,490	14,490	14,490
Annual operational planning and performance monitoring	294,309	294,309	294,309	294,309
Strengthen resource mobilisation and financial management	252,000	147,450	72,450	219,800
NMEP administrative support	504,555	239,488	239,287	239,488
Funding gap in US\$	2,652,332	1,699,421	1,552,800	1,898,401

3 Financing

3.1 Background

In order to reduce malaria burden to the pre-elimination by 2020, the malaria programme will require major investments in malaria control and elimination activities. This will involve commitment from all tiers of Nigerian government, development partners, the private sector and institutions. Resource mobilization from traditional partners such as the Global Fund, the United States Agency for International Development, World Bank, United Kingdom Agency for International Development and multi-lateral agencies will go on through the development of concept notes and funding proposals. By meeting with potential partners, appropriate mechanisms to make funding requests will be developed and submitted to mobilize resources in cash or in kind. Nigeria will need long-term partnerships with all stakeholders in order to ensure additionality and complementarity to achieve the vision of a country free of malaria.

Already, the Federal Government of Nigeria has made strong commitments for partial financial support for some of the key interventions like IRS and larviciding, which are to be scaled up, to achieve the desired targets in malaria control. State Governments have in the past given resources for prevention and treatment interventions, but these are not consistent across all States. The role of State governments is pivotal in achieving malaria control and elimination goals. The Federal Ministry of Health, the NMEP and strategic partners will conduct advocacy with State leadership to devote state resources to support key interventions.

Engagement of the informal and formal private sector in malaria control is a priority. The pharmaceutical sector is already engaged to support the provision of quality assured malaria medicines to the general public. In addition, members have received information and training on diagnosis and appropriate treatment for their patients. There are several avenues for engagement of corporations and industries in malaria control with best practice examples from countries in the region. In general, agencies may provide the support directly to communities in which they work, with technical support from the NMEP, Federal and State Health agencies.

3.2 Rationale for continued investment in malaria

3.2.1 Social and economic impact of malaria in Nigeria

Effects on businesses

Malaria affects many businesses and private sector enterprises through employee absenteeism occasioned by their own ill health or that of their

dependants. In addition, companies also experience increased health care spending to maintain health of employees. All these result in:

Decreased productivity

Loss of company competitiveness, business failure, loss of reputation

In a study of businesses in Africa in 2011, 72% of companies reported that malaria negatively affected their business while 40% reported that this effect was “serious” (Roll Back Malaria, 2011).

Social effects

Children and women in rural areas are at the greatest risk of death or severe debility from malaria and often benefit least from malaria programmes when resources are scarce. Even with efforts to ensure equity in coverage with prevention measures such as ITN ownership, disadvantaged communities have lower access to public health care services. Each episode of malaria drains the household resources – with expenditure of US\$ 12-20 per episode of malaria (Sicuri et al., 2013) and almost 50% of household expenditure on health being spent on malaria (Onwujekwe et al., 2000). Malaria therefore:

- Worsens household poverty in already vulnerable populations
- Increases the risk of mortality from lack of resources to seek treatment
- Increases burden of expenditure on families when mortality occurs – up to one year’s resources may be required to bury a family member.

Effects on Education

In the 1990’s a study in Nigeria showed that malaria accounted for 15% of health-related absenteeism from school (Leighton and Foster, 1993). Malaria affects mental and physical development in children and in high burden countries like Nigeria, up to 60% of children in affected communities may face learning impairment due to repeated illness and innocuously, from effects of severe anaemia. Malaria therefore negatively impacts education and lack of education reduces individual competitiveness and keeps affected households in an unending cycle of poverty and malaria.

Effects on Economic Growth

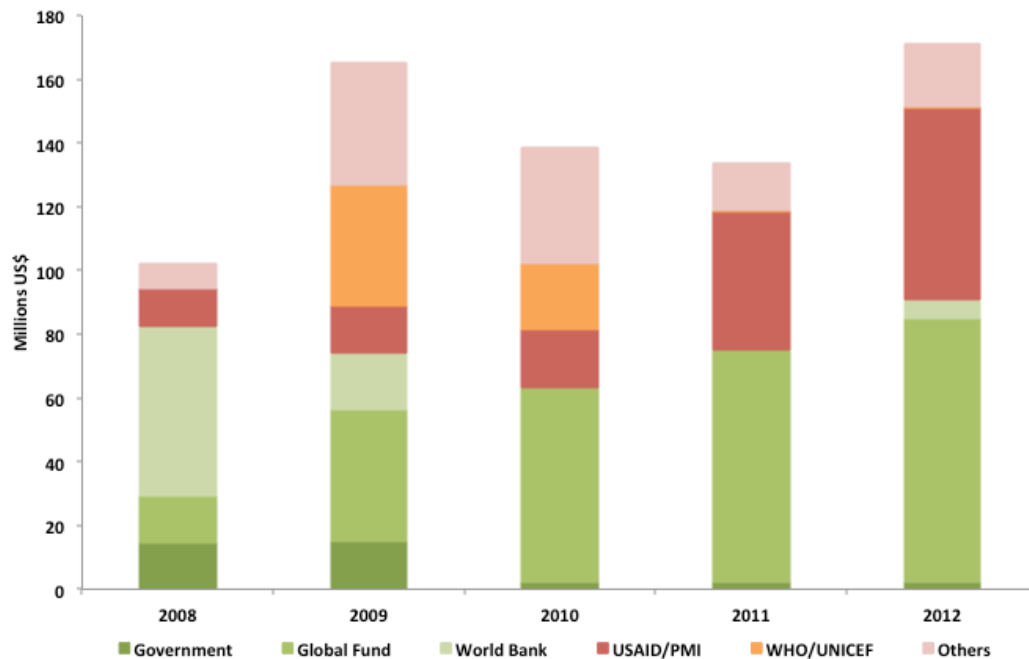
From 2014, Nigeria became Africa’s largest economy. The country also has the largest malaria burden, which continues to dampen economic growth. Malaria is estimated to cause US\$ 12 billion loss in Africa annually (Gallup and Sachs, 2001), while the World Economic Forum has acknowledged that in high burden countries like Nigeria, malaria can impact the gross domestic product by as much as an estimated 5–6% per year (World Economic Forum, 2006).

Reducing the burden of malaria could help to break the vicious cycle between illness and poverty that contributes to low social and economic development in endemic countries

3.2.2 Funding for malaria control and elimination in Nigeria is a priority

1. It is estimated that over 200,000 children die from malaria annually in Nigeria, which is about 25% of infant mortality 20% of under-five mortality. Malaria also causes up to 11% of maternal mortality. Nigeria and the Democratic Republic of the Congo (DRC) together account for 40% of the estimated global malaria mortality (WHO, 2013). With almost three times the population of the DRC it is therefore most probable that Nigeria alone contributes 25% to 30% of the global mortality burden of malaria.
2. International funding for malaria control has generally been targeted to countries with higher mortality rates and lower national incomes, particularly those in Africa. International investments increased significantly from 2001-2011 and have leveled off and even reduced since then.
3. Even when both local and international resources are considered, there is a 50% funding gap for malaria interventions every year leaving millions of people (usually the poor and most vulnerable) without access to prevention and treatment.
4. Nigeria with a large population at risk experiences the greatest funding constraints and because of this: morbidity and mortality levels will persist, negatively impacting investment, economic, social and education, and consequently national development. For example, ACTs are not universally available at all public health facilities in Nigeria, due to insufficient quantities procured and low capacity of the supply chain to ensure supply.
5. Nigeria has been a recipient of funding from different sources including multilateral and bilateral agencies, local and international private sector agencies, non-governmental organizations and the Federal and State Governments. From 2002 to 2013, Nigeria received about US \$ 1 billion from various partners plus the local government to fight malaria with about \$ 600 million disbursed between 2008 and 2012 (Figure 2.2)

Figure 3.1: Sources of Financing for Malaria in Nigeria



Source: Adapted from World Malaria Report 2013

6. Although the funding invested in Nigeria seems significant, when the population at risk is considered, funding per person at risk of malaria control in Nigeria (and the Democratic Republic of Congo) is less than half the average per-capita funding received by other endemic countries in Africa (Pigott et al., 2012).
7. Despite inadequate funding, progress has been made in reducing morbidity and mortality due to malaria in Nigeria. Both an increase in and continued funding are required to create a large and lasting impact.
8. Inconsistent funding has been the single largest cause of resurgence of malaria in areas where it had been successfully controlled (Cohen et al., 2012). Malaria has been successfully controlled in certain regions in Nigeria the past. For example, the Garki Malaria Project successfully reduced malaria prevalence from highs of more than 50% to less than 5% using IRS and effective treatment. When the project ended, the prevalence resurged back to the baseline within three years (Molineaux and Gramiccia, 1980). With this past experiences, it is imperative that efforts to control malaria in the country are applied uniformly in order to sustain gains and prevent quick resurgence.
9. With adequate resources, the desired impact of reducing morbidity and mortality can be achieved and sustained. In order to do this, there is need for the mobilization of adequate resources every year to deliver interventions to all persons at risk of malaria.

10. Continuous investment of public and private resources for malaria control becomes even more important as the country progresses towards malaria elimination. Evidence shows that between 2000 and 2012, countries that in addition to receiving external resources prioritized local investments in malaria were more successful than other countries in malaria control (WHO, 2013)

3.2.3 Value for money

Investment in malaria control and elimination is value for money. The current strategies for malaria prevention and treatment in Nigeria are evidence based, and globally recommended for effectiveness. True value for money is achieved when universal coverage for populations at risk is achieved. In Nigeria, the goal is to achieve economy, efficiency, effectiveness and equity in coverage with appropriate interventions depending on the sub-national malaria epidemiological profile.

Investing in malaria is investing to strengthen the health system, and is also value for money. Malaria is an integral part of health care system in Nigeria including community level where integrated community case management (iCCM) is delivered. The integration of preventive services (LLIN distribution to infants and pregnant women through child and maternal health clinics strengthens service availability and utilization, thus improving coverage of other health interventions.

The following actions have been defined by the Roll Back Malaria partnership as essential to ensure value for money and are also targeted for implementation by the malaria partnership in Nigeria

Universal coverage and access

- Universal coverage with a vector control intervention (LLIN or IRS)
- Universal diagnosis and effective treatment malaria – improves quality of care for malaria and of other non-malarial fevers and enables documentation of true malaria cases
- Ensuring availability of affordable effective malaria treatments and insecticide treated nets in the private sector

Health systems strengthening

- Ensuring availability of essential medicines, quality of care and access to services. These in turn lead to effectiveness of the implemented interventions.
- Integration of malaria case management with community case management of childhood illnesses

Performance monitoring, evaluation and accountability

- Strengthening routine reporting and monitoring of true malaria cases and deaths through the national health information systems. Availability of quality data will enable planning and targeting of resources to areas of most need.
- Strengthening data quality and data use at all levels of the health system.
- Ensuring equity in access to malaria prevention and treatment interventions, making special efforts to reach out to marginalized and indigent populations.

3.3 Financial Gap Analysis 2014-2017

The financial resources required to implement malaria control activities from 2014-2017 are presented. Table 4.1 shows the annual budget required to implement activities by objective. Figure 4.1 shows the budget in US \$ by service delivery area and the proportionate allocation to the service delivery area. Table 4.3 shows financial gaps by objective and year.

Table 3.1: 2014-2017 budget in US dollars by objective

Objective	2014	2015	2016	2017	Total 2014-2017
Malaria Prevention	361,034,625	250,269,298	310,583,029	712,370,955	1,634,257,908
Diagnosis	114,824,301	179,205,894	216,037,327	233,784,729	743,852,252
Treatment	71,158,634	191,624,376	149,717,520	145,293,210	557,793,739
Advocacy Communication and Social Mobilization	3,455,777	5,426,741	3,470,031	3,852,281	16,204,830
Surveillance Monitoring and Evaluation	3,636,719	2,762,409	2,363,352	3,151,457	11,913,937
Procurement and supply chain management	1,368,661	1,968,242	1,705,343	1,705,343	6,747,589
Programme Management	2,652,332	1,699,421	1,552,800	1,898,401	7,802,954
Total Budget (US\$)	558,131,050	632,956,381	685,429,402	1,102,056,376	2,978,573,208

Figure 3.2: 2014-2017 budget by service delivery categories

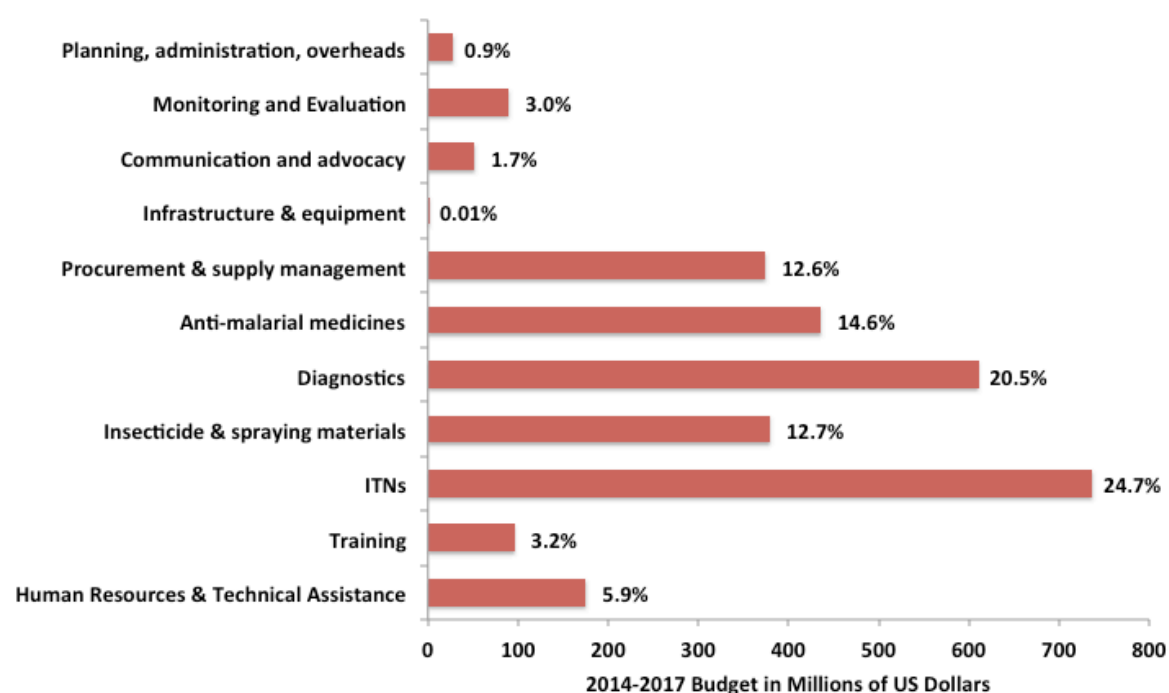


Table 3.2: Financial Gap Analysis in US Dollars

Objective		2014	2015	2016	2017	2014-2017
Malaria Prevention	Budget	361,034,625	250,269,298	310,583,029	712,370,955	1,634,257,908
	Available	312,058,348	50,700,856	9,028,924	9,028,924	380,817,052
	Gap	48,976,277	199,568,442	301,554,105	703,342,031	1,253,440,856
Diagnosis	Budget	114,824,301	179,205,894	216,037,327	233,784,729	743,852,252
	Available	24,223,946	5,100,000	-	-	29,323,946
	Gap	90,600,355	174,105,894	216,037,327	233,784,729	714,528,306
Treatment	Budget	71,158,634	191,624,376	149,717,520	145,293,210	557,793,739
	Available	41,283,064	656,080	-	-	41,939,144
	Gap	29,875,570	190,968,296	149,717,520	145,293,210	515,854,595
Advocacy Communication and Social Mobilization	Budget	3,455,777	5,426,741	3,470,031	3,852,281	16,204,830
	Available	2,419,044	-	-	-	2,419,044
	Gap	1,036,733	5,426,741	3,470,031	3,852,281	13,785,786
Surveillance Monitoring and Evaluation	Budget	3,636,719	2,762,409	2,363,352	3,151,457	11,913,937
	Available	2,182,031	-	-	-	2,182,031
	Gap	1,454,688	2,762,409	2,363,352	3,151,457	9,731,906
Procurement and Supply Chain Management	Budget	1,368,661	1,968,242	1,705,343	1,705,343	6,747,589
	Available	1,094,929	-	-	-	1,094,929
	Gap	273,732	1,968,242	1,705,343	1,705,343	5,652,660
Programme Management	Budget	2,652,332	1,699,421	1,552,800	1,898,401	7,802,954
	Available	1,326,166	-	-	-	1,326,166
	Gap	1,326,166	1,699,421	1,552,800	1,898,401	6,476,788
Total	Budget	558,131,050	632,956,381	685,429,402	1,102,056,376	2,978,573,208
	Available	384,587,528	56,456,936	9,028,924	9,028,924	459,102,312
	Gap	173,543,522	576,499,445	676,400,478	1,093,027,452	2,519,470,896

3.4 Funding needs by intervention

3.4.1 Malaria prevention

Malaria prevention interventions comprise 55.4% of budgetary requirements or US\$1.6 billion (NGN 245 billion) between 2014 and 2017. The majority of the funding is for vector control interventions 58% LLINs, 36% IRS and 1% Larval Source Management. Costs for other prevention measures are: intermittent preventive treatment in pregnancy (IPTp) 3% and seasonal malaria chemoprevention (SMC) for children under 5 years 2%.

3.4.2 Malaria diagnosis and treatment

The scale up to universal coverage with malaria diagnosis using rapid tests (RDTs) symbolizes an increase in the cost of case management. The budget for diagnosis and treatment from 2014-2017 is US\$ 1.3 billion (NGN 191 billion) or 43.4% of the total budget. These costs include diagnostics and medicines, training of health workers and quality assurance for diagnostic services. The

implementation of iCCM represents <1% of the costs of malaria case management in the period. After universal coverage with LLINs is achieved by the end of 2016 reductions in the need for diagnostics and treatments may be realised from 2018-2020.

3.4.3 Programmatic support

These include crosscutting interventions such as monitoring and evaluation, operational research; advocacy communication and social mobilization; and programme coordination and management. These represent about 5% of the overall budget and include supporting activities included with the prevention and treatment interventions.

3.5 Resource Mobilization Plan

3.5.1 Preamble

The guiding principles for the implementation of malaria interventions are Equity, Efficiency, Effectiveness and Quality of Care.

Equity: While everyone in Nigeria is at some risk of malaria, the burden is especially heavy for the poor due to inability to access appropriate prevention and treatments. To reduce this equity, prevention and treatment interventions are delivered at no cost or at highly subsidized cost. Public education is essential to ensure that the indigent populations are aware and therefore benefit.

Efficiency and effectiveness: In management of financial resources and intervention implementation through joint and open planning, budgeting and performance monitoring. All interventions selected have been shown to be cost effective in malaria control and elimination. However, these will need to be delivered efficiently in order that the effectiveness and cost benefits may be realized. For example prolonged distribution of LLINs and prevents attainment of a critical mass of coverage needed to achieve maximum effectiveness from the intervention.

Quality of Care: Quality of care in malaria is correlated with survival. Ensuring consistent availability of commodities, adequate and well trained health workers care improves quality care. Crucially, shifting the task of case management for uncomplicated illness to community level can unburden primary health care services and improve quality of care patients receive at both levels.

3.5.2 Sources of Financing

Four principal sources of financing will be targeted for investment in malaria in Nigeria. These sources are not new to malaria and mobilization strategies are aimed at increasing their investment in order to achieve the sufficient reduction in the malaria burden to pre-elimination levels.

3.5.2.1 *Increased allocations from Federal and State Governments*

The Federal Ministry of Health competes with other line ministries for the allocation of Government revenues. Funding allocation to health fluctuates from time to time and this can affect allocations to malaria control. Efforts will be

Countries that prioritized local investments in malaria were more successful than other countries at achieving control and elimination WHO 2013

made to facilitate dialogue with the political leadership, Ministers of Finance and Health to honour commitments to health financing and devote resources to malaria as a priority public health problem in Nigeria.

3.5.2.2 *Increased funding from bilateral and multilateral agencies*

Nigeria, like many countries in sub-Saharan Africa, relies heavily on external resources for malaria control. These resources have been received from The Global Fund to Fight Aids, Tuberculosis and Malaria, World Bank, United States Agency for International Development and United Kingdom Department for International Development. A potential source of funding for the health sector including malaria is the African Development Bank, and local financial institutions. Funding requests to these agencies are made through proposals following calls for expression of interest, or following bilateral discussions.

3.5.2.3 *Funding from private sector agencies and individuals*

The private sector has the capacity to mobilize resources and play an important role in public health and development. Private sector corporations and individuals in Nigeria are largely untapped as a source of financing for malaria. While the NMEP has engaged non-governmental organizations (NGOs) and the informal private sector – in particular PPMVs as implementing partners, partnership with the mainstream sector has not been explored, and is now planned. Private sector corporations and individuals working through philanthropic foundations have successfully contributed to malaria control in their countries and or regions and also benefitted economically from malaria control. Private individuals may also through personal contributions or through foundations support the malaria cause, following the example of the Bill and Melinda Gates Foundation, Carlos Slim Foundation, United Nations Foundation,

Clinton Foundation and many others that have supported malaria initiatives in several countries including Nigeria.

Figure 3.3: Examples of private sector engagement in malaria control

Private sector engagement in malaria control

Said Salim Bakhresa and Co Ltd

In Tanzania, Said Salim Bakhresa & Co. (SSB) is an African-owned flourmill company based in Dar es Salaam. After a study found that one in five of its employees contracted malaria each month, SSB launched a malaria control program in 2008. It distributed ITNs to its 6,000 employees and their families and offered free testing and treatment at its three onsite clinics. It also established a diagnostics and training centre at the company's headquarters. After implementing the program, employee absenteeism related to malaria fell by 80%. The company now spends a third of what it used to spend on malaria medication at its clinics—monthly drug costs fell from US\$10,000 to \$3,400 (ALMA et al., 2011)

AngloGold Ashanti – Ghana

AngloGold Ashanti (AGA) is a global gold mining company and the world's third largest gold producer operates mines in Obuasi and Iduapriem located in the Ashanti and Western regions of Ghana. The Obuasi mine has about 4,700 employees and their dependants living in a community around the mine. In 2005, the mine hospital (Edwin Cade) saw on average 6,800 malaria cases each month, of which 2,500 were mine employees. School and work absenteeism was rife. An average of three days off work per patient meant 7,500 man-day shifts lost per month. This coupled with the slow work rate during recuperation, resulted in a major loss in production with costs of medical care reaching US\$ 660,000 per annum. The company decided to invest in vector control, combining the distribution of nets to workers and their families, IRS and larviciding, health education and prompt treatment of illnesses with effective medicines. By 2012, the number of malaria cases at the hospital dropped to less than 50 a month, and company malaria treatment costs fell from US\$ 55,000 to US\$ 510 per month. Number of man-days lost per month also fell from around 7,000 to 90 (Segbaya, 2013)

3.5.2.4 Public fund raising projects and other innovations

Funds for malaria control may be generated through special fund raising schemes involving the public. Innovations such as those used by UNITAID to raise funds from airline tickets have been used to support malaria control interventions globally. Nigeria has been a beneficiary of UNITAID support in introducing injectable artesunate for the treatment of severe malaria as well as in the provision of nets and anti-retroviral therapies. In discussions with stakeholders, such public financing of projects will be explored to support the country's efforts to significantly reduce malaria burden to pre-elimination levels.

Table 3.3: Resource mobilization objectives and outcomes

Partners	Objective	Desired outcomes	Responsible
Federal and State Governments	View malaria as public health priority Honour prior funding level commitments Devote more funding to achieve goals	Additional financing for malaria Dedicated malaria funding External partners respond to increased local investment	NMEP Multilateral partners NGOs Academia
Multilateral and bilateral agencies	Increase funding for malaria control Reach out to new bilateral and multilateral agencies	Additional external resources devoted to fight malaria in Nigeria	FMoH, NMEP, FMoF, Multilateral Bilateral Partners
Private sector corporations, individuals and foundations	Engage as partners in malaria control Provide resources in kind Invest in communities	Private sector becomes a key partner in malaria control in Nigeria	NMEP FMoH States NGOs Private sector
Innovative fund raising projects	Raise domestic/public funds to support interventions through consensus from all stakeholders Perceived as a potentially sustainable source of funding	Additional domestic and or international financing is raised for malaria control	FMoH, FMoF, States, NGOs

3.6 Benefits of Investing in Malaria

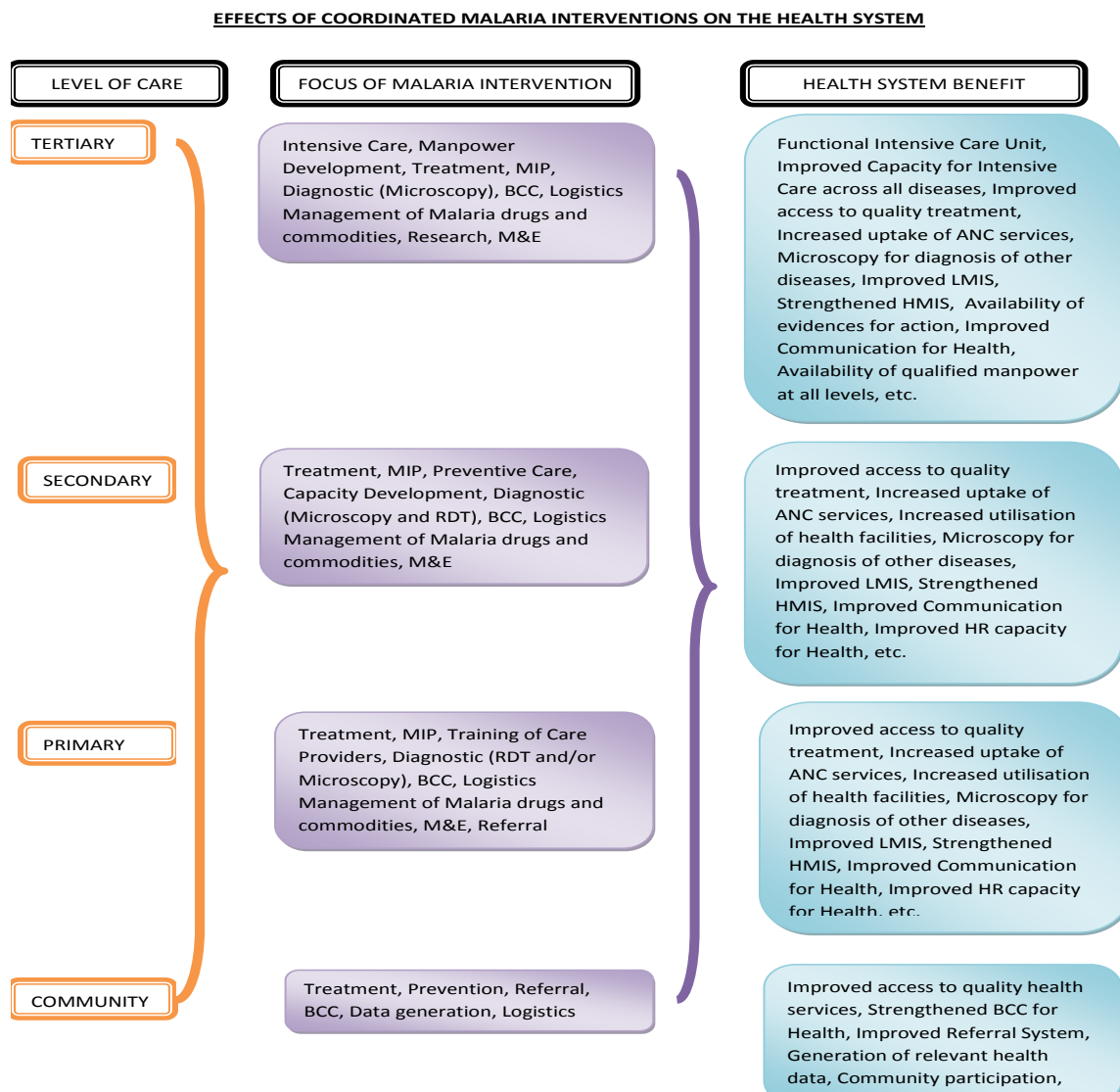
3.6.1 Positive impact on Millennium Development Goals (MDG)

Investment in malaria control in Nigeria will positively and significantly impact MDGs and in particular MDG 4 on Child Survival, MDG 5 on maternal health and MDG 6 on communicable diseases. Malaria causes about a third of child mortality and a little over 10 percent of maternal mortality in Nigeria. Investing in malaria will save nearly 200,000 lives of children and pregnant women annually. In addition to these, malaria also directly contributes to MDG 1 on reducing extreme poverty and hunger by alleviating the socio-economic impact of disease on poor families that keeps them impoverished. Controlling malaria also contributes to MDG 2 on universal primary education by minimising school absenteeism and learning challenges that school age children with malaria experience.

3.6.2 Health systems strengthening

Investing in malaria is investing in health systems. Where malaria has been controlled, the burden on inpatient and outpatient services significantly declines. Provision of diagnostic services and training of health workers not only improves quality of care for malaria, but also for other febrile illnesses. Through surveillance, monitoring and evaluation and quality assurance programmes, investing in malaria is an investment in improving the capacity of the health system to carry out these services. The effects of malaria interventions on the health system are shown in figure 4.2

Figure 3.4: Effects of malaria interventions on the health system



3.6.3 Return on investment

Investing in malaria is value for money and offers a significant return on investment, whether the gains are a healthy populace, household social security, corporate profits or national development (see figure 4.2)

4 Risks and mitigating factors

The following are potential risks and threats to the achievement of significant reduction in malaria burden and progression towards the goal of malaria elimination; and suggested mitigating factors.

4.1 Dependence on external resources

Malaria activities in Nigeria over the past decade have been largely dependent on international donors. The current target is to attain the pre-elimination target by 2020 and this requires even more funding. Economic challenges in donor countries increase uncertainty of availability of external resources. It therefore becomes necessary for the country to embark on an aggressive internal funds mobilization strategy to ensure the achievement of the goals of the Business Plan.

4.2 Commodity security

Manufacturers' capacity to produce antimalarial commodities largely determines the availability of the products. It is important to ensure that only manufacturers' with proven capacity for production and delivery of commodities are engaged, since the malaria programme is highly dependent on the availability of products. A strong supply chain that is responsive to the needs of the end users is essential. The current supply chain for commodities, particularly within States will be strengthened in to ensure reliable transportation and management of commodities.

4.3 Fluctuating commodity costs

The market for public health commodities is subject to the laws of supply and demand. As a large country, the demand for medicines and prevention commodities may result in price fluctuations that may negatively affect resource needs. The Roll Back Malaria partnership has over the years negotiated prices for commodities with manufacturers to ensure they are affordable by developing countries. The programme will continue to take advantage of negotiated commodity prices to stay within projected budgets.

4.4 Resistance to medicines and insecticides

Parasite resistance to medicines in the past caused major setbacks in the fight against malaria. Both drug and insecticide resistance may render current malaria interventions ineffective. In order to mitigate this, regular monitoring of drug and insecticide resistance will be implemented. In addition, efforts to prevent resistance by ensuring appropriate use of medicines and insecticides

will be implemented. Key to this will be the strengthening and enforcing of regulations targeted at removing substandard commodities and non-recommended therapies that continue to harm the health of the people.

4.5 Governance, financial control and oversight

Failure to adhere to local and international requirements for financial management may result in withholding of funds or delays in disbursements. Loss of trust and confidence by partners will significantly impair any progress made in malaria control in Nigeria. While it takes years to achieve control, it only takes a few months to reverse gains made. The programme will ensure transparency and efficiency in financial management of entrusted resources. This will include mutual performance monitoring and actions to ensure targets are met in a timely manner. Ensuring high standards of financial and programmatic performance is essential to unlocking additional resources.

4.6 Insecurity

The persistent security situation in the North East region of the country affects implementation of public health programmes. As far as possible, collaboration with States and security agents will be required to ensure uninterrupted health services to vulnerable groups

5 Conclusion

Nigeria bears the highest burden of malaria illness and death globally. It is ranked first by the Roll Back Malaria Partnership in terms of investment needs to reduce global burden of mortality. Due to the country's large population, most of who are at high risk of malaria, considerable investments are required to control the disease and reduce its impact on the health, social and economic well being of individuals as well as national development. Nigeria has received considerable amounts of external resources particularly from the Global Fund, World Bank, USAID and UKAID. While these resources have helped the country make gains in malaria control, more investment is needed to enable the country attain universal coverage with interventions in order to achieve impact seen in successful sub-Saharan countries. It will cost US\$ 2.9 billion from 2014-2018 to achieve universal coverage of the whole population with malaria interventions. This amounts to just US\$ 17 for every Nigerian over a 4-year period.

Nigeria is largely dependent on external donors to deliver malaria control interventions. There is an opportunity to increase domestic support for malaria control and to explore more sustainable sources of funding. Regardless of source, ensuring economy, efficiency and effectiveness and equity in the use of resources will enable targets to be achieved and build highest confidence in the programme by all partners.

References

- ALMA, E2Pi and CHAI (2011) *Maintaining the Gains in Global Malaria Control: African Leaders Malaria Alliance, Evidence to Policy Initiative of the Global Health Group, Clinton Health Access Initiative*. Available at: <http://globalhealthsciences.ucsf.edu/sites/default/files/content/ghg/e2pi-maintaining-the-gains-country-briefs.pdf> (Accessed: April 25, 2014).
- Cohen, J. M., Smith, D. L., Cotter, C., Ward, A., Yamey, G., Sabot, O. J. and Moonen, B. (2012) 'Malaria resurgence: a systematic review and assessment of its causes', *Malar J*, 11, pp. 122.
- FMoH (2008) *Malaria Strategic Plan 2009-2013: A Road Map for Malaria Control in Nigeria* Abuja, Nigeria: National Malaria Control Programme, Federal Ministry of Health.
- FMoH (2014) *Draft National Malaria Strategic Plan 2014-2020*, Abuja, Nigeria: National Malaria Elimination Programme, Federal Ministry of Health
- Gallup, J. L. and Sachs, J. D. (2001) 'The economic burden of malaria', *Am J Trop Med Hyg*, 64(1-2 Suppl), pp. 85-96.
- Leighton, C. and Foster, R. (1993) *Economic impacts of malaria in Kenya and Nigeria* Abt Associates Research Study No. 6). Available at: <http://www.healthsystems2020.org/content/resource/detail/765/> (Accessed: May 2, 2014).
- Mokuolu, O., Ntadom, G., Ajumobi, O., Adedoyin, O., Roberts, A., Agomo, C., Edozieh, K., Okafor, H., Wammanda, R., Odey, F., Maikore, I., Abikoye, O., Alabi, A. and Ezeigwe, N. 2013. Experiences with implementation of malaria diagnostic testing and primary health care level in Nigeria: Implications for scale up.
- Molineaux, L. and Gramiccia, G. (1980) *The Garki Project: Research on the Epidemiology and Control of Malaria in the Sudan Savanna of West Africa*, Geneva: World Health Organization.
- NMCP, SuNMAP, WHO and INFORM Project (2013) *A description of the epidemiology of malaria to guide the planning of control in Nigeria: A report prepared for the Federal Ministry of Health, Roll Back Malaria Partnership and the United Kingdom Department for International Development* Abuja, Nigeria: National Malaria Control Programme, Federal Ministry of Health
- NPC and ICF International (2013) *Nigeria Demographic and Health Survey 2013: Preliminary Report* Abuja, Nigeria.
- NPC, NMCP and ICF International (2012) *Nigeria Malaria Indicator Survey 2010*, Abuja, Nigeria: National Population Commission, National Malaria Control Programme and ICF International.
- Onwujekwe, O., Chima, R. and Okonkwo, P. (2000) 'Economic burden of malaria illness on households versus that of all other illness episodes: a study in five malaria holo-endemic Nigerian communities', *Health Policy*, 54(2), pp. 143-59.
- Pigott, D. M., Atun, R., Moyes, C. L., Hay, S. I. and Gething, P. W. (2012) 'Funding for malaria control 2006-2010: a comprehensive global assessment', *Malar J*, 11, pp. 246.

- Roll Back Malaria (2011) *Business Investing in Malaria Control: Economic Returns and a Healthy Workforce for Africa*, Progress and Impact Series No.6. Geneva: Roll Back Malaria Partnership.
- Segbaya, S. 'Private Sector Leadership in Malaria Control: Lessons from AngloGold Ashanti - Ghana', *12th Novartis NMCP Best Practice Sharing Workshop*, Kampala, Uganda, 26-27 June 2013.
- Sicuri, E., Vieta, A., Lindner, L., Constenla, D. and Sauboin, C. (2013) 'The economic costs of malaria in children in three sub-Saharan countries: Ghana, Tanzania and Kenya', *Malar J*, 12, pp. 307.
- WHO (2013) *World Malaria Report: 2013*, Geneva, Switzerland: World Health Organization.
- World Economic Forum (2006) *Business and Malaria: A neglected threat?* , Davos, Switzerland: WEF Global Health Initiative