Uganda

Malaria Control Strategic Plan

2011 – 2015

National Malaria Control Programme

Contents

Preface: About the Malaria Control Strategic Plan

The Malaria Control Strategic Plan (MCSP) draws on the involved consensus of more than 20 stakeholders from government and the private sector, Missions and NGO's and CSOs. It pulls together an evidence-based plan of action for malaria prevention and control. The Strategic Plan outlines the context and enabling environment for:

- Four strategic approaches that will:
  - provide malaria prevention measures and treatment to the population, including special approaches for vulnerable groups like pregnant women and children.
  - guarantee all people access to quick and effective treatment, to significantly reduce illness and death from malaria.
  - improve epidemic preparedness and response

- Five essential cross-cutting strategies on:
  - information, education and communication, and social mobilisation
  - health systems strengthening
  - monitoring, evaluation and research
  - financing
  - human resources, management and supervision

- An institutional framework that will;
  - ensure co-ordinated, multi-lateral, national response that harnesses RBM and reflects Uganda's policies on health sector reform and poverty alleviation.

- Mobilisation of resources to achieve the proposed targets.

The MCSP is not a technical manual for prevention and control of malaria. It aims to set up a strategic direction for the creation and implementation of such guidelines by:

- co-ordinating stakeholders and efforts
- strengthening partnerships
- integrating systems
- advocating resource priority
- focusing national commitment

The MCSP will provide:

For the **Ministry of Health**: (a) a framework for advocating greater public participation, and (b) resource allocation to malaria control
For **health development partners**: a framework for considering and monitoring effective, co-ordinated support for malaria control
For **implementation partners:** a basis for strategic roles and consistent action towards a common goal
For **the NMCP:** a strategic direction for development of annual work plans
For **districts:** a framework to implement strategies at district, health facility and community levels.

Acronyms

ACT	Artemesinin based Combination
CSOs	Civil Society Organisations
CQ	Chloroquine
EDA	Essential Drugs Account
ENSO	El Nino Southern Oscillation
HBMF	Home Based Management of Fever
HMIS	Health Management and Information System
HSSP	Health Sector Strategic Plan
IPT	Intermittent Preventive Treatment
IRS	Indoor Residual Spraying
ITNs	Insecticide Treated Mosquito Nets
LLINs	Long Lasting Insecticide Nets
MCP	Malaria Control Programme
MOH	Ministry of Health
NHS	National Health System
NRA	National Resistance Army
PLWHA	People Living with HIV and AIDS
RBM	Roll Back Malaria
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic and Health Survey
UNMHCP	Uganda National Minimum Health care package
WHO	World Health Organisation

1. Background and Situational Analysis

1.1. Country Profile

1.1.1. Environment

The Republic of Uganda is a small landlocked country found in East Africa, positioned between 1° South of the Equator and 4° North. Uganda shares its borders with Sudan in the North, Kenya in the East, DR Congo in the west and Tanzania and Rwanda in the South. Uganda covers an area of about 241, 039 square kilometres and is divided into about 84 districts. There is a decentralisation of power to the local governments within the districts. Nevertheless, Government still maintains a central role of policy, setting and supervision of standards and enforcing and maintaining security of the nation.

Uganda experiences a favourable tropical climate owing to its relatively high altitude (between 1,300 and 1,500m), with mean annual temperature between 16° C in the Southwest, 25° C in the Centre, East and Northwest and close to 30° C in the Northeast. The regions of West, Central and eastern Uganda experience two peaks of rain fall in the year from March to May and from September to December with decreased intensity. Towards the northern part of the country, the rain levels start to fall and culminate into just one rainfall peak in the year. In sync with the rainfall pattern, the soil fertility tends to be more fertile in the west and central regions and less fertile towards the northern and eastern parts of the country. Subsequently, Uganda's vegetation is varied due to this uniqueness in climatic conditions with tropical rain forests in the south to savannah woodland and semi deserts in the northern part (UBOS 2001).

1.1.2. Economy

Uganda is mainly an agricultural economy with a large subsistence base and a smaller scale agricultural-based industry. There is enough food production in the country with a rather inequitable distribution throughout the country's regions. Uganda's post independence economy from 1962 to 1970 thrived with its Gross domestic product growing at a rate of 5% per annum and it population at a rate of 2.6% per annum. However there was devastation of the social and economic infrastructure following the period of political turmoil in the 1970 and 1980s. This consequently led to a break down in the provision of most social, health and educational services. When the then new government of NRA came into power in 1986, there was an introduction of several policies and reform programmes that set the country on the road to economic recovery. The economy grew at an astronomical rate of 6.2% which was greater than the population growth rate at 2.9% from 1996 to 2000. In the same period the GDP per capita grew at a rate of 2.6% per annum (UBOS 2001).

1.1.3. Demography

Uganda had a population of 29,899,000 by the year 2006 and the total fertility rate per woman had reached 6.6 in the same year. The gross national product per capita (PPP international) was $880 in 2006 (MOH 2006). The pressure on Uganda's land is increasing due to the persistent population growth rate, with 124 people per square kilometre in 2002 from 25 people per square kilometre in 1948 (UBOS 2001). The majority Ugandans live in rural areas but the trend towards urbanization is increasing. In 1969 only 6.6% lived in urban areas (54% of these in Kampala) and this proportion has increased to 7.4% in 1980, 11.3% in 1991 and 12.3% in 2002 (40% of these in Kampala) resulting in a total of 3 million people in urban areas. Infant mortality at 75 per 1000 live births in 2006 and maternal mortality rate at 435 per 100 000 in the year 2006, are still high and below both the national and MDG targets (MOH 2008). Life expectancy for a Ugandan at birth was 50 years in 2006, having increased from 46 in the year 2000. The population pyramid of Uganda is typical for developing countries with 49.3% aged less than 15 years and only 4.5% 60 years or older. The proportion of children under 5 was 18.6% in 2002 and that of women in child bearing age (15-49 years) 22.4%.

1.1.4. Health System

The National Health Policy and the Health Sector Strategic Plans are implemented through partnerships within the broad framework of the Health Sector Wide Approach (SWAp) as defined in the Memorandum of Understanding between government and development partners. The Government of Uganda, through the Ministry of Health, has the lead role and responsibility for delivering the outputs of HSSP but does this in close cooperation with other sectors of government as well as Civil Society, the private sector and development partners. A number of mechanisms have been established in order to ensure coordination, continuity and regular reviews. The most important of these are the Health Policy Advisory Committee (HPAC), the bi-annual joint review missions, the Health Sector Working Group and the annual National Health Assembly.

Uganda's Health System includes the Public Sector, Private-not-for-profit (PNFP), Private health practitioners (PHP), the traditional and complementary medicine practitioners (TCMP) and the communities. The formal health system comprises the public, PNFP and PHP sectors, but there is a fairly large informal sector ranging from traditional medicine, medicine vendors and shops, and to complementary and alternative practitioners. The public sector in Uganda is stratified into the following categories: Ministry of Health and other national level institutions; national referral hospitals; regional hospitals presumed to serve about 2, 000, 000 people each; and District Health services (usually with a general hospital) which serve 500, 000 people at the district level. The next level is the Health Sub-district which consists of a tier of services within itself. At the health sub-district there is a referral facility (either a general hospital or a Health Centre IV). A

health centre IV serves 100,000 people. The Health Centre III at the sub-county level, serves a population of 20, 000 and mainly covers outpatient services and deliveries. The Health Centre II at the parish level serves about 5, 000 people, and provides very basic preventive and curative health services. Although not a physical structure, the Health Centre I is any structure at community level which provides health services through volunteers and is increasingly organized in "village health teams".

Districts are decentralized to a large degree and are directly responsible for the delivery of health services and the implementation of health programmes. They make their own health plans and budgets and receive financial support through a variety of mechanisms directly from the Ministry of Finance. The role of the Ministry of Health, therefore, is policy development, strategic planning and orientation, technical support, guidance and supervision, M&E, quality assurance and interventions in case of epidemics. In order to improve and facilitate the interaction between districts and central level area teams have been formed which provide regular, integrated support supervision. A similar role is played by a system of zonal coordinators which exist for TB, IMCI and malaria.

Achievement of the HSSP II objectives including that of providing the Uganda National Minimum Health care package (UNMHCP) require an efficient system for the procurement and management of essential medicines, vaccines and health supplies (EMHS). This is why the Ministry of Health now employs a (order-based) supply pull system rather than the push system that was earlier used. It is in this light that an Essential drugs Account (EDA) was instituted to offer credit facilities to the two existing medical stores in Uganda. These are namely; the National medical stores which manages the supplies of the public sector and the Joint medical Stores which manage supplies for the PNFP sector (MOH, 2005b). Financing for EMHS is challenged by inadequate financing, as well as by the recent introduction of relatively new life saving health procedures; including Artemesinin based Combination therapies (ACTs), Long lasting Insecticide Nets (LLINs), Antiretroviral treatment and pentavalent vaccines.

The health sector continues to be severely under-funded. Over the last decade, government spending on health has been increasing, both nominally and in real terms. Although public spending on health (including donor assistance) increased from about US$8 to US$11 per capita from 2001/02 to 2006/07, it remains significantly lower than the target of US$28 per capita estimated as the amount required for providing the Uganda National Minimum Health Care Package (MoH 2002), and is also lower than the US$40 per capita estimated by World Health Organization as minimum expenditure required for funding the health sector in developing countries. Government spending on health was only 9.6% of total government spending in 2007/8. This is substantially lower than the Abuja target of committing 15% of annual government budget to the health sector. Health care financing in Uganda is characterised as being predominantly out-of–pocket based, as households contributed almost 51.3% to the private sector's

total expenditure on health. Development partners and Global Health Initiatives are a major source of financing, especially for diseases like HIV/AIDS and for areas affected by conflict and civil unrest like northern Uganda (WHO, 2007).

Despite the increase in the percentage of well trained human resources taking up posts in the health sector, there is still a shortage in the number of human resources required to meet the objectives of the health sector as laid out in the HSSP II. This is considered to be the most significant problem in the failure to implement the minimum health care package. The recent Midterm review reported that about 48% of local government posts and 74% of posts at regional referral hospitals were filled. Although government has initiated efforts to curb the high staff attrition rates in the public sector, the challenge of inequitable distribution of staff across districts remains, with only 12 (of the 80 districts) having achieved the agreed minimum staffing levels of 80% (MOH, 2008).

The Health Management Information System (HMIS) collects data from all health facilities in the public and not-for profit private sector with respect to curative as well as preventive services. This system has been continuously improved over the years to meet the changing needs for programme monitoring and planning at district as well as national levels (e.g. IPT data). During the HSSP II efforts have been made to strengthen data quality and utilization of data. The completeness and timeliness of reporting has improved. However HMIS data reporting faces many challenges including improper distribution and collection at different health facility levels. This has subsequently led to use of HMIS only as a quarterly and annual reporting method but not as a proper tool for management. Although there is continuous improvement in reporting from the district to centre, follow up at the district levels remains a major challenge. Like any other Health sector player, HMIS faces shortage of human resources including IT support systems staff and minimum level data analysis software systems.

1.2. Malaria Situation

1.2.1. Epidemiology

Parasite Species

Plasmodium falciparum is the main malaria parasite specie although all four plasmodium species can be found in Uganda. Nevertheless, more than 95% of all malaria cases are attributed to plasmodium falciparum which usually leads to acute malaria. P. malariae contributes to about 1-3% of all malaria cases making it the second commonest plasmodium specie. However co-infection with P. falciparum and malariae has been found to be even higher and contributing to about 16% of all infections in children living in highly endemic areas. Finally, although P. vivax and P. ovale species are the rarest of all plasmodium species they still contribute to 1-1.5 % of all malaria cases.

Vectors

The most common malaria vectors in Uganda include members of *Anopheles gambiae s.l.* and *Anopheles funestus.* Members of the *Anopheles gambiae* are the dominant species in most places. There are five species within the Anopheles Gambiae family of which only three types are found in Uganda. Within the *A. gambiae* complex the predominantly anthropophilic and endophilic *Anopheles gambiae s.s.* is by far the most common with *A. arabiensis* found in 1- 10% and a non-malaria vector, *A. quadriannulatus* in less than 5%. There is also the A. a*rabiansis* species and the A. *bwambae* species is commonly found in the River Semiliki forest hot springs. Contrary to popular belief, mosquitoes don't breed just anywhere, but each of the species has genetically programmed behaviour which determines its breeding and biting patterns. For instance the Anopheles mosquito found in Uganda is known to bite and rest indoors. Available information indicates complete susceptibility of the local malaria vectors to insecticides which are currently used for both IRS and ITNs in Uganda.

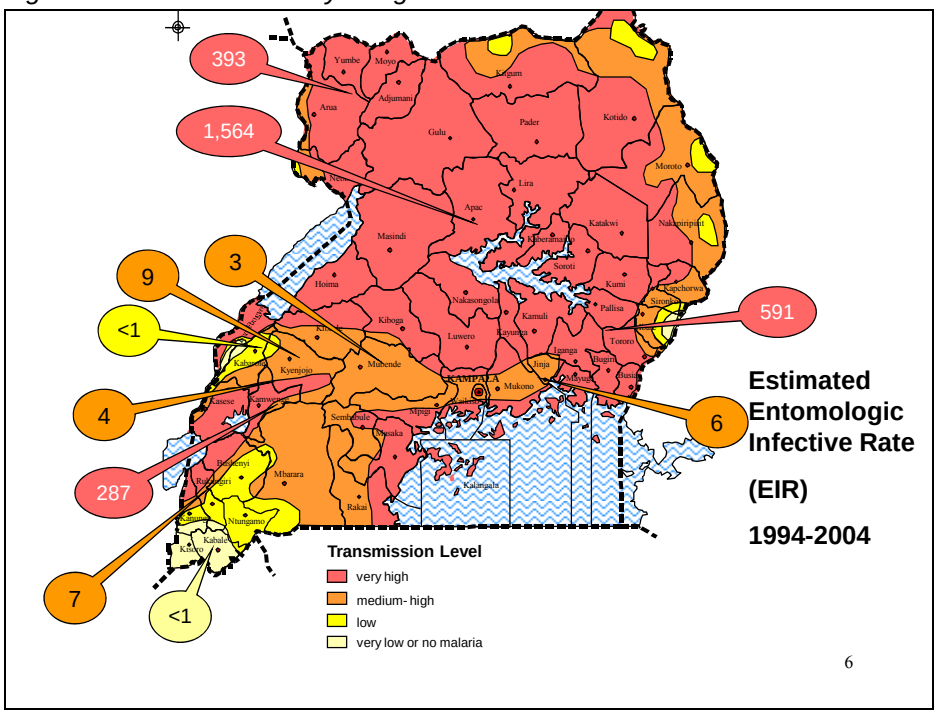
Transmission

The climate in most parts of the country is conducive for the transmission of malaria. The transmission levels are perennial in nature and are experienced in 95% of the country with transmission rates varying from moderate to high. Malaria transmission in Uganda is stable and perennial in 90-95% of the country. The areas of stable transmission are divided into three epidemiological zones: areas of very high transmission levels with over 100 infective bites per person per year (70% of the country); Areas with medium to high transmission levels with 10-100 infective bites per person per year (20% of the country); areas of low transmission with less than 10 infective bites per person per year (10% of the country), (see Figure 1). Malaria parasite prevalence rates (asymptomatic) among children below 10 years range between 10% and 90%. Whereas older children, adolescents and adults in stable transmission areas have some degree of partial immunity, children under 5 years of age, pregnant women, and people living with HIV/AIDS are at high risk and are the most vulnerable groups. Approximately, 5 - 10% of the country is subject to low, unstable transmission and prone to epidemics. All four human plasmodia species occur in Uganda but Plasmodium falciparum is the most common contributing 90-98% of the parasite population. The second most common species is *P. malariae* with 1-3% as mono-infection but is more commonly found as a mixed infection with *P. falciparum* (up to 16% of childhood infections in highly endemic areas). Both *P. vivax* and *P.ovale* are rare and do not exceed 1-1.5% of malaria cases.

There are some few areas in Uganda that are prone to epidemics. These include the South West where altitudes reach about 1800 Metres, the slopes of Mt. Elgon in the East and Rwenzori Mountain in the West. In these areas, outbreaks have been known to occur frequently between 2-3 years but larger scale epidemics are not commonly known to occur in these areas. In the years of 1992, 1994, 1997/8 and 2000/01 malaria

epidemics broke out in Uganda. The most memorable one was in 1998 as a result of the El Nino Southern Oscillation (ENSO) weather catastrophe that occurred in East Africa (MOH, 2001). About 14 districts in Uganda are at risk of malaria epidemics almost every two years.

Figure 1: Malaria endemicity in Uganda



Source: Malaria Control Program: accessed on 15 July 2009 at www.health.go.ug/mcp

Populations at Risk

Malaria is clearly the leading cause of morbidity and mortality in Uganda and at least every one in Uganda is at risk of falling ill and dying of malaria (HSSP, 2005). However there are biologically vulnerable groups of people (e.g. children under 5 years, pregnant women and people living with HIV/AIDS), who have a special need for protection from malaria.

The population distribution pattern in Uganda is highly uneven, implying therefore that different populations are exposed to different malaria transmission rates. The biggest proportion of the population of 87.9% of about 29 million people is likely to face moderate to high malaria transmission. Hyper and holo endemicity transmission is applicable to about 62.5% of the population. Only 25.4% of the population or about 6.8 million people are in meso endemicity areas. Finally, about 12.1% or 3.3 million people are exposed to areas of hypo endemicity or unsteady or no malaria transmission areas.

In highly endemic areas, children below 5 years have the highest cases of dying from malaria at almost 25-30 % of all malaria deaths. Furthermore children under five years contribute about 70, 000-100,000 of all malaria deaths in the country per year. Indeed malaria has different unwanted effects in different malaria prone areas. For instance, 22% of underweight babies at birth are as a direct cause of malaria in highly endemic areas while in low endemic areas; malaria is more likely to lead to abortion.

Moreover poverty is likely to aggravate malaria like with any other diseases since poor households may lack the resources with which to protect and treat themselves and their families against malaria. Poor households may have sub-standard housing with cracks and holes which may facilitate the inflow of mosquitoes and their breeding. This therefore implies that 38% or 10.2 million households living below the poverty line are indeed vulnerable to malaria. In addition, one million PLWHA and about 1.6 million internally displaced persons in northern Uganda are also considered among the most vulnerable people to malaria exposure (MOH, 2005e).

1.2.2. Brief History of Malaria in Uganda

In 1998, the Roll Back Malaria (RBM) program was launched following a worldwide concern about the burden of malaria. The RBM strategy employs stakeholder partnerships and elements of social justice in fighting malaria to reduce its negative effects on human kind. This strategy emphasises the strengthening of health system structures and promotes prevention measures as well evidence-based curative alternatives in the fight against malaria. In 2000, at the Abuja convention held in Nigeria, Heads of state re-affirmed their commitment to implementing the RBM and achieving its objectives.

In Uganda, malaria had not been a priority disease until recently and neither had any structured form of funding been allocated to it until around 1995 when a malaria control unit was set up in the Ministry of Health. Like many sub-Saharan countries, Uganda is party to the Abuja declaration and is committed to enforcing its implementation (MOH, 2001). In light of this, Uganda tailored its strategies and targets to the RBM targets. These include to;

i. Increase the proportion of pregnant women who have completed IPT2 from 34 to 80%
ii. Increase the proportion of households having at least one insecticide-treated nets (ITN) from 15 to 70%
iii. Increase the proportion of targeted structures for indoor residual spraying (IRS) in epidemic areas from 0 to 80%
iv. Increase the proportion of children under five getting correct treatment within 24 hours of onset of symptoms from 25- 80%

v. Reduce the case fatality rate among malaria in-patients under five from 4 to 2%

The main interventions that are used in Uganda to fight malaria fall into three main categories of prevention, promotion and case management under the structure of the malaria control policy framework. Initially, chloroquine monotherapy therapy was used as the first line of treatment but later proved to be ineffective and was replaced by a combination of sulfadoxine and pyrimethamine. This was closely followed by commencement of the Home based management of fever (HBMF) strategy in 2000.

The Abuja declaration targets were too ambitious to be achieved by the year 2005 so the MOH tailored them to suit their own as laid out in the HSSP II. They were convinced that these were more realistic goals that could be achieved within the envisioned time frame.

Abuja and HSSP 2005 targets	2002	Estimated progress made by 2008/9
60% of under-fives and pregnant women sleeping under ITNs	5%	45%
60% of pregnant women receiving IPT1 and IPT2	5%	30%
60% of under-fives with fever receiving effective treatment within 24 hours	7%	60%

Source: .....

Over the past decade, there has been a deliberate effort to improve the approaches to malaria control and reducing its impact on the Ugandan population. The health system has been reinforced and supply of anti-malarial drugs has been increased. Through the contribution of partnerships, there has been a scale-up in the intermittent preventive treatment in pregnancy (IPT) and ITNs. On the other hand, the Inter-Agency Coordination Committee of Malaria (ICCM) organises and strengthens stakeholder participation. In 2004, Artemesinin based Combination therapy (ACT) was introduced as the first line treatment regimen after a surveillance of close drug sensitivity was concluded (MOH, 2005b).

One of the key interventions so far has been the insecticide treated nets (ITNs). These ITNs were first used on a very random scale by people living around Lake Kyoga. The initial district based distributions were conducted by NGOs like AMREF and UPHOLD. This was after the initial community focus group discussions which revealed that malaria was a high ranking problem that needed to be tackled. In response, these NGOs and bilateral organisations brought nets, which numbered in a few thousand, so as to open up the way to their future operations in districts like Mubende. This strategy was seriously evaluated and then taken on as a key prevention strategy in the malaria control

policy in 1998.In world records, Uganda was amongst the premier countries to initiate tax and tariff waivers on ITNs in the FY 2000/01. This provided the much needed boost for the commercial mosquito net and ITN sector which has since shown potential growth.

All the same a lot still needs to be done as challenges still abound in extending programme interventions and implementation of the first line drugs throughout the country.

1.2.3. Current status of control efforts

NOTE: This whole section is lacking – due to lack of up-to-date information on the achievements and obstacles over the past 5 years (2005 – 2008/9). Your assistance is highly required to help us finalise this document.

1.2.3.1. Prevention (Vector Control)

Insecticide treated Nets

ITNs have been proven to be the most effective prevention tool against malaria. These advantages are multidimensional in nature as a person using an ITN protects themselves from mosquito bites and on killing the insect, the ITN also offers protection to other community members who would otherwise be bitten by mosquitoes (WHOM and UNICEF, 2003). The scale up of ITNs has been hindered by their high costs and in order to solve this problem the Abuja declaration requested and encouraged governments to execute waivers and tax cuts on the cost of nets in their countries. Uganda was one of the first countries to put this requirement into place and by the year 2001, ITNs could be obtained in Uganda at a fraction of their actual cost.

In addition to cutting costs of ITNs, government of Uganda had to look into re-treatment of the existing nets to maintain their effectiveness. Initially it was proposed that the nets already in the public be retreated twice a year but this turned out to be very costly leading to re-treatment only once year. In order to avoid such extra costs, a consensus was reached amongst the stakeholders to import, manufacture and distribute LLINs that do not require any re-treatment for their lifetime and which are also the highest quality nets on the market. The biggest efforts for LLIN distribution in Uganda took place between 2005 and 2008, with the support of key partners including Global fund, PMI and UNICEF. During this period, the focus of LLIN campaigns was pregnant women and children under five, rather than universal coverage.

The main challenges for scaled-up implementation of the LLIN strategy in Uganda has been inadequate supply and high cost of LLINs. Current national LLINs ownership (1

net/2 persons) is estimated at 40%. Universal coverage of 1 LLINs per 2 persons and 80% utilization is expected to be achieved by 2010, with the support of Global Fund (Round 7) resources. However, implementing Round 7 activities has faced major delays due to inadequate procurement systems and overall management of the GF project within the country. These have deterred the NMCP goal of achieving universal coverage. However, mechanisms have been put in place to address those issues and nets are expected to arrive in the country in the coming months.

Indoor Residual Spraying

The goal of IRS in Uganda is to contribute to the national goal of reducing malaria related morbidity, mortality, poverty, and disability through effective vector control interventions including IRS. The operation of IRS is to be done in epidemic prone areas which normally have unstable transmission rates as well in areas where conventional vector control methods are not likely to work. In the last couple of years, at least one round of IRS has been implemented in about 8 districts. Due to inadequate funding, however, there has been interruption in spraying activities. Such interruptions are likely to have a negative impact on malaria transmission, as well as on the development of insecticide resistance.

IRS is currently targeted at post-conflict/border districts as well as epidemic and urban areas. However, support for IRS is currently only available to cover 2/15 epidemic prone districts and 6/19 post-conflict districts, with two more post-conflict areas to receive funding for IRS in 2010. Inadequate coverage with IRS relative to where the NMCP are targeting has resulted in reduced impact on malaria transmission. In addition, to financial constraints which IRS is facing there has also been a high level of opposition to the use of DDT in Uganda. Poor communication and information on the IRS strategy and safe use of DDT is thought to have caused misperceptions about this strategy. As a result, environmental groups have taken action against the Ministry of Health through a court injunction to stop the use of DDT; however, this injunction has since been lifted. The NMCP are planning strict measures to ensure safe use of DDT to minimize environmental impact during its current spray campaigns.

Environmental management

There's is very little progress in designing and implementing environmental management as an intervention for the prevention and reduction of malaria transmission in Uganda. There were two pilot studies carried out in two urban areas that proved that elimination of anopheles is possible in urban settings

1.2.3.2. Case Management

This strategy aims at:

- Improving treatment-seeking behaviour so that patients or caretakers recognise the signs and symptoms, know what action to take and where treatment is available.
- Improving access to effective diagnosis and treatment; in terms of access to physical facilities, drugs and trained providers
- Ensuring an adequate supply of effective drugs and ancillary supplies.
- Strengthening the referral system

There is effort to educate and create awareness among the population on proactive endeavours and behaviour to fight malaria. This is especially with regards to those looking after children, mothers and leaders in the community. To this end, first line drugs are now available in communities through Community Medicine distributors whose work is supervised by the health units in the areas where they operate. In addition, owners of shops and clinics are to be trained in proper management of malaria and on how to carry out referrals in case the need arises.

The timely procurement and supply of malaria medical supplies and drugs is supported by through NMCP by partners of the MOH. These partners in conjunction with the National Medical Stores and private supplies are involved in the design, implementation of the procurement and supply chain.

The main challenge for malaria treatment is prolonged medicine stockouts. This has mainly been due to the inability to access funds from GFATM Round 4 Phase 2 planned for procurement of these medicines. As such, the country has been unable to implement the HMBF strategy to attain the increase of availability of medicine to have patients treated for malaria within 24 hours of onset of fever. The country is expecting supplies of 39,410,964 ACTs from Phase 2 of GF Round 4. Forecasts of malaria caseloads indicate that ACTs brought in from Round 4, in addition to GOU and partner stocks will ensure supply to ACTs and for HBMF until 2011/2012. While Uganda is eligible for AMFm and is in the process of completing its application for this facility, currently there are no other supplies or subsidized schemes that will ensure supply of ACTs for the public health sector beyond 2011/2012.

Drug Resistance and treatment policy

Drug resistance in many parts of Africa has made prevention and treatment of malaria very difficult. The cheapest drug to treat malaria was Chloroquine (CQ) which has been phased out as plasmodium is now resistant to it. Therefore as a result of large scale resistance to many of the cheaper drugs, fewer and more expensive alternatives are left for the treatment of malaria. This is due to the fact that plasmodium parasites are less likely to be resistant to combination therapies like Artemesinin (ACT) which is currently recommended as the first line drug, world-wide (WHO and UNICEF, 2003).

Home-based management of Fever

Home-based management of fever is an intervention that has been put into place by MOH and its partners so as to escalate the process of achieving the objectives of the Abuja declaration (MOH, HBMF implementation guideline). The proper management of fevers within the home and communities is likely to lead to reductions in malaria related morbidity and deaths in children below the age of five. The strategy is based on the following three principle components;

i. Communication for behaviour change
ii. Distribution of pre-packaged antimalarials
iii. Strengthening the health facilities to manage patients referred from the communities.

The objectives of the strategy include;

I. To increase to 60% the proportion of children under five years suffering from fever/malaria, who have access to pre-packaged antimalarial drugs at household level, by the end of 2003.
II. To increase to 50% the proportion of children who receive early appropriate treatment (with pre-packed Chloroquine and SP within 24 hours of onset of fever) for fever/malaria, at the household level, by the end of 2003.
III. To increase to 50% the proportion of children with severe fever illness, that are promptly referred to formal providers, by the end of 2003
IV. To increase the proportion of health facilities that offer appropriate care to children with fever/malaria.

Diagnosis

Clinical and self-diagnosis are the commonest way of diagnosing malaria in Uganda, thus potentially leading to wrong treatment of many fever cases with anti-malarial drugs, and thus potentially leading to the development and spread of resistance to antimalarials. Due to resource constraints, clinical and symptom-based diagnosis will remain favoured in most health facilities apart from those that have enough laboratory facilities. Nevertheless, rapid diagnostics and microscopy should be used in cases where numerous species exist or where there's low malaria prevalence in order to ensure high accuracy and specificity.

Inadequate laboratory equipment and supplies, limited human capacity (either in numbers or expertise) and slow uptake of RDTs is hampering accurate diagnosis of malaria. RDT roll-out is limited by the lack of experience with their use on a large-scale as well as the lack of a comprehensive quality assurance and control system which complements microscopical diagnosis. This is attributable to non-release of GFATM funds from Round 4 Phase 2. As a result, inappropriate use of the limited supply of ACTs denies those with true malaria access to effective treatment.

Severe Malaria

Infection with plasmodium falciparum has been known to lead to severe malaria which can be fatal if not treated as quickly as possible with complicated medical management and therapy.

Severe and complicated disease, after failure of oral medication, is usually characterised by sustained severe fever, compromise of consciousness and /or respiration and must be managed within 12 hours. Artesunate suppository administered close-to-home is an integral component of the home management of malaria. There is evidence that this intervention can greatly reduce the risk of death in patients with early signs of severe malaria[1] (RBM, 2004).

1.2.3.3. Malaria in Pregnancy

Malaria infection during pregnancies is one of the biggest public health concerns in many tropical and sub-tropical countries. It is also clear that pregnant women are the highest risk category in adults when it comes to susceptibility to malaria (WHO and UNICEF, 2003). Like with other at risk groups, malaria infection in women is commonly associated with plasmodium falciparum. Over 30 million women living in malaria prone areas become pregnant each year making malaria in pregnancy a problem of a large magnitude. Therefore to study the current situation of malaria in pregnant women, there is a need to recap on the Abuja targets that specifically refer to malaria in pregnancy and these include;

- At least 60% coverage of pregnant women at risk of malaria with most suitable combination of personal and community protective measures.
- At least 60% of all pregnant women at risk of malaria, especially in those in their first pregnancies, shall have access to intermittent preventive treatment (1).

In line with the variance in transmission rates in the country, pregnant women in varying areas of transmission rates will be affected differently. It has been found that pregnant women in areas of low or unstable transmission rates face the highest malaria infections while those in areas of high transmission rates have developed clinical immunity and usually do not manifest any clinical symptoms or fever following infection by plasmodium falciparum [2](WHO and UNICEF, 2003).

To reach the Abuja Summit goal, a three point approach has been proposed;

- Intermittent preventive treatment
- Insecticide-treated nets
- Effective case management of malaria illness

Insecticide treated nets and effective management of malaria illness have both been discussed in the previous sections.

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[1] RBM, 2004. *The RBM partnership's Global Response: A programmatic Strategy 2004-2008*, June

[2] World Health Organisation and UNICEF. (2003) "*The Africa Malaria Report*"

Intermittent preventive treatment (IPT)

The WHO expert Committee on Malaria has proposed that women with their first and second pregnancies, be given one dose of an effective antimalarial drug as part of their routine antenatal visits in highly endemic areas. (WHO and UNICEF, 2003). Currently sulfadoxine-pyrimethine (SP) is the most effective single therapeutic dose for intermittent preventive treatment in pregnant women. The magnitude of the problem has led up to 15% of maternal anaemia cases and leads to 35% of preventable low birth weight.

IPTp1 and IPTp2 uptake is low (40% and 16% respectively) relative to ANC utilisation which is estimated at 94% for first visits and 85% for second visits. There is no documented reason for the disparity between figures for ANC utilisation and IPTp coverage, which suggests a research gap that needs immediate addressing. Observation indicates that the skeletal staff in health centres are overwhelmed by large numbers of patients including pregnant women, the first visit to ANC is made too late in pregnancy to allow for a second dose of Sulfadoxine-Pyrimethamine (SP) to be administered and the perception by some women that medications can harm the foetus (PMI, 2008). In addition, the lack of safe water and cups limits the provision of DOTs for SP. PMI is supporting the programme to address this situation. Since 2006, nearly 1,700 health workers have been trained on IPTp and provided with wall-charts and job-aids. PMI is also supporting the provision of cups and water containers for provision of safe water at ANCs which has also been identified as an issue.

Epidemic preparedness and response

There is little documented on this strategy. Epidemic Preparedness Task Forces at national and district levels are not currently operational because of lack of funding. Data analyses are not being carried out at source thus focal outbreaks are not being detected; reports are not timely or complete enough to allow for prompt response. Efforts to address these weaknesses include updating EPR guidelines, revitalizing EPR Task Forces at national and district level and training of health workers in epidemic early detection using health facility specific normal channels.

1.2.3.4. Advocacy, IEC & Social Mobilization

Almost the entire population in Uganda is aware of malaria as a disease, however very few have knowledge on malaria and the control interventions available. Therefore there is a need to educate the population and guide it in the control of malaria [3](MOH, 2003). Subsequently, in order to have an impact on community behaviour, there is need to mobilise them to take part in community based malaria control activities. The political

[3] Ministry of Health.(2003) "*Policy and Strategy for Insecticide Treated Nets*", Malaria Control Programme March

leaders at the national and district level need to be included and involved in this process through sensitisation. There is need to develop and produce IEC materials whilst conducting social mobilisation at the district level. The participation in national and international malaria days including conferences is also a part of the above intervention in management and control of malaria.

BCC is not taking place in a comprehensive, integrated and ongoing way in order to support the National program as a whole. There is also inadequate interpersonal communication between health workers and the communities. This has led to slow uptake of interventions, as well as misconceptions of malaria control interventions. To mitigate the effects of this weakness, efforts to translate the comprehensive communications strategy for malaria control by encouraging partner buy-in has been intensified. In addition, all projects and partners implementing malaria interventions have been advised to support this area. The adoption of the VHT strategy is expected strengthen interpersonal communication and community mobilization.

1.2.3.5. Malaria Control Programme and the RBM Partnership

The Roll Back Malaria (RBM) partnership was initiated in 1998 by the World Health Organisation (WHO), United Nations Children's Fund (UNICEF), United Nation Development Fund (UNDP) and the World Bank. RBM is a forum for stakeholders and not an implementing agent, with the goal to halve malaria by 2010 (Ministry of Health Online resource). All malaria partners are represented on the RBM board, where Tanzania represents all the Southern and Eastern African countries. RBM has its secretariat located in Geneva and several regional Networks. Uganda malaria partners are members of the East Africa RBM Network (EARN). It is clear that by controlling malaria, the RBM will have contributed to the achieving the United Nations (UN) Millennium Development goals (RBM, 2004).

At the national level the program has inadequate office space, computing equipment and supplies. Major weaknesses in programme management is lack of financial support to operationalise Malaria Zonal Coordinators, and District Malaria Focal Persons. The result of this is an inability to provide technical supervision and timely transmission of HMIS and malaria-specific data. These weaknesses are being addressed, through partner support, to make most efficient use of available space and provide some equipment for the program.

1.2.3.6. M&E and Research

Monitoring of malaria programs is done using routinely collected data and surveys. Through co-supervision and sharing of resources, provisions have been made to strengthen the IDRS and HMIS (MOH, 2001). Currently there are some regular data,

available, however the bulk of most data is to be obtained from conducting singular surveys each year. There are also plans to fund mapping of the risk of malaria in Uganda and in light of the enormity of this undertaking, the tasks have been spread out throughout the lifetime of the project, implying that funds will be needed every year for this.

Operational research has been identified as an integral part of this process and areas to be researched shall be identified after monitoring and evaluation of out puts and results has been received (MOH, 2003). Operational research conducted by independent researchers or those commissioned by MCP will be facilitated and shall cover all areas and aspects of the several malaria strategies.

HMIS is weak with untimely and incomplete reporting. There are multiple reasons for those gaps; staff training, health facility workloads and poor systems to allow for transmission of data upwards from lower level facilities. In addition to these issues, at the national level the M&E unit lacks computers and printers. Nine sentinel sites are currently operational. However, current data on programme indicators are not always available from those sites because of staffing and supply issues. The number of sentinel sites is not representative of all epidemiological zones. Another weakness is inadequate reporting from partners and the private sector. As a result of these weakness the programs ability to plan and monitor impact of interventions is severely constrained. However, this is partly being addressed by a comprehensive M&E plan that was developed by all partners in 2008/2009, the introduction of a malaria data base in the malaria control programme and the existing RBM partnerships forum that meets regularly to plan and review progress in a unified manner. In addition, partners are supporting the provision of servers to allow program data and documents to be aggregated in one place and easily accessible to all program staff. Lastly, PMI is now supporting existing sentinel sites to make them as comprehensive as possible and provision of internet connections at sites in order to supply timely data.

1.2.3.7. Health Systems

The following are the major health system-related weaknesses and gaps that affect malaria outcomes.

Inadequate funding of the health sector: Although the Abuja target is for governments to allocate 15% of their annual national budgets to the health sector by 2005, the current allocation to MoH in Uganda stands at 11%. Although significant improvements have been observed in the recent years, it is unlikely to achieve the health sector targets, including those that are malaria specific at this level of funding.

Weak national procurement and supply management systems: There have been ongoing issues with procurement and supply management systems in Uganda. The overriding issues have come about because of challenges to the procurement unit in meeting specific procurement requirements of the Global Funds. The GF has worked with the MoH to address these challenges faced by the Ministry of Health Procurement and Disposal Unit (PDU). In the meantime, this has resulted in several delays to implementation of previous Global Fund rounds leading to widespread stock outs of life-saving malaria commodities. In addition to the higher level issues, there are also frequent stock-outs at health facilities of ACTs as a result of lack of rational drug use, inability of district to order on time and inaccurate quantifications.

Inadequate coverage of diagnostic services: While it is government policy to have laboratory (microscopy) diagnostic services down to health centre IIIs (i.e. at hospitals and referral health facilities), there are serious gaps of diagnostics such as microscopes or adequately trained personnel in most of health facilities. With incoming funds it is predicted that 87% of health facilities which are meant to use microscopy will have at least one microscope by 2011. However, this does not address the situation at lower level health facilities such as health facility II's and community level management of malaria. Furthermore, there is a need to augment the current quality assurance system to accommodate the use of Rapid Diagnostic Tests.

Inadequate human resources for health: Uganda, like many other developing countries in the world, suffers from inadequate human resources for health. Currently, the proportion of established positions filled in most health facilities ranges from 33 – 68%. This compromises timely and efficient delivery of services across the entire health system. This ultimately affects the quality of services delivered for the three disease components.

Weak partner coordination mechanisms: Although partners are increasingly contributing to health service delivery, especially at the grass roots, the coordination of their inputs and activities is still inadequate. Specifically for malaria, MACIS' (Malaria & Childhood Illnesses Secretariat) capacity to effectively fulfill this function on behalf of government is very limited, due to low staffing levels and inadequate supportive resources.

Weak Health Information Systems and M&E: There is lack of robust integrated data capturing and transmission from the lowest to the highest point of the health system. As such, vital information such as consumption data for critical supplies is hard to collate. The health information collected (HMIS) from health centres is frequently incomplete and submitted late. There is also a challenge of updating HMIS to capture new information requirements from programs such as consumption data of ACTs and use of RDTs. There is a need to improve the capacity of the Resource Centre at the Ministry of Health to cope with increasing incoming data and information requirements.

2. Vision and Mission: 2010/11 – 2014/15

Our vision is that at the end of the period of the strategic plan:
Malaria will no longer be the major cause of illness and death in Uganda and families will have universal access to malaria prevention as well as treatment.

To this end, our mission is to reduce the level of malaria infection and consequent malaria death in Uganda by *75*% by the year 2015, and to sustain that improved level of control to 2020.

3. Objectives, Guiding Principles & Strategic Framework

3.1. Objectives

The **overall goals** of malaria control in Uganda are:

I. To control and prevent malaria morbidity and mortality, and thereby minimize the social effects and economic losses attributable to malaria in the country.
II. To contribute to the reduction of under five all-cause mortality rate, as a result of reduced malaria mortality.

The **specific objectives** for the period 2010/11 – 2014/15 are:

- To provide definitive diagnosis to at least **85%** of suspected malaria cases treated in the public sector
- To provide effective treatment (using ACTs) to at least **85%** of people with uncomplicated malaria within 24 hours of onset of symptoms, for whether they seek treatment in the public or private sectors.
- To provide universal coverage and utilization of preventive measures, either with LLINs, or IRS, singly or in combination to all malaria at risk population.
- To provide effective treatment for pregnant women with at least two doses of intermittent presumptive treatment with a safe antimalarial.
- To provide an enabling environment for implementation of key malaria interventions. Such an environment includes ensuring comprehensive behavioural change towards malaria prevention, personal protection and appropriate treatment seeking, obtaining adequate financing for malaria control interventions, ensuring appropriate and adequate human resources, conducting relevant operational research, monitoring and evaluation and overall health systems strengthening, among others, to ensure effective implementation of the key malaria control interventions to achieve the desired goals.

3.2. Guiding principles

These objectives will be achieved by setting priorities and applying the following principles:

- A rapid and sustained increase of total population coverage with malaria preventive measures (Long lasting insecticidal nets and/or Indoor residual spraying as appropriate);
- Ensuring that high quality clinical and parasitological diagnosis is used to guide case management;
- Prompt and effective treatment with highly effective artemisinin-based combination therapy to affected populations, and improving management of severe malaria at all levels of health care;
- Packaging these interventions so that all aspects of malaria control are simultaneously and comprehensively addressed (co-coverage);
- Emphasising communication for behavioural change and community empowerment;
- Achieving impact among most vulnerable groups such as young children, PLWHA and pregnant women *(especially in highly endemic areas)*;
- Targeting economically disadvantaged (poor) or difficult to reach populations (IDP, nomads etc.) with free *or highly subsidized* interventions;
- Continuing to build a strong RBM partnership involving all stakeholders, including communities and the *private sector;*
- Achieving maximum synergy between malaria control and health system development as well as other programmes within the HSSP III;
- Applying an evidence-based approach to further development and improvement of malaria control interventions.

3.3. Strategic Framework

Several key strategies have been ratified by the RBM Partnership and GoU in developing the 2010-2015 National Malaria Strategic Plan. These strategies are consistent with the Global RBM Strategy for Sustainable Program Scale-Up.

3.3.1. Rapid National Scale Up for Impact

Epidemiological studies from a range of malaria-transmission settings in Africa indicate that coverage of the core malaria control interventions in the range of 70% to 80% of the at-risk communities and populations is required to achieve dramatic reductions in malaria mortality and morbidity and reversal of the economic burden that malaria places on individuals, communities, and health services. The RBM partnership has determined that scaling the package of malaria control interventions, as defined in the strategic plan,

to 85% coverage in the first three years of the next six-year plan is both feasible and required to bring malaria under control.

3.3.2. Integrated Package of Malaria Interventions

Malaria control scale up should be an integrated package of prevention and curative interventions that is epidemiologically tailored for the local setting. The balance between investments in ITNs and IRS is particularly important in Uganda considering the logistical challenges of programming to high coverage in sparsely populated but high-risk rural areas.

3.3.3. Focus on Prevention during Rapid Scale Up

Prevention interventions are recognised to be highly cost effective due to the lower technological and skills requirements in administering preventive interventions. While the rapid scale up of malaria control will be an integrated package of both prevention and curative interventions, the emphasis on prevention, especially for rapid scale-up, will result in a dramatic decrease in the incidence of new infections. The financial burden that Artemisinin combination therapies (ACTs) and parasitological diagnosis place on the financing of malaria control can be markedly reduced by rapid scale up of ITN and IRS coverage, particularly in high-transmission regions.

3.3.4. Commitment to Performance Monitoring and Impact Evaluation

Malaria control efforts must be highly accountable in order to build confidence that malaria control will produce the promised burden reduction and economic benefit. Further, with the infusion of financing for malaria control currently being experienced by Uganda, it is important to develop highly accountable programme management and financial systems to assure national and global supporters of the solid business practices of malaria control. This implies the development of strong performance monitoring and impact-evaluation systems by the MoH and the NMCP.

3.3.5. Achievement of international targets

Malaria is recognised, at international level, as a global problem. As such, efforts have been invested in identifying the most effective malaria control interventions. In addition, a lot of effort has gone into resource mobilisation, advocacy, development of tools, research, and monitoring and evaluation, with the view to guide, support and build the capacity of individual countries to plan and implement malaria control interventions relevant in their local settings. Uganda is committed to working within the global malaria control strategy and framework, and such develops its strategies in context of the commitments to achieve the global targets for malaria control (see Figure 1).

Figure 1: Global malaria control goals and targets

Key International Malaria Control Goals and Targets

RBM Partnership

- To halve malaria-associated mortality by 2010 and again by 2015

Millennium Development Goals

Goal 2: Achieving universal primary education

- Malaria is a leading source of illnesses and absenteeism in school age children and teachers. It adversely affects education by impeding school enrolment, attendance, cognition, and learning.

Goal 4: Reducing child mortality

- Malaria is a leading cause of child mortality in endemic areas.

Goal 5: Improving maternal health

- Malaria causes anemia in pregnant women and low birth weight.

Goal 6: Combating HIV/AIDS, malaria, and other diseases. Target 8: to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

- Malaria morbidity and mortality are increasing in Africa.

Goal 8: Developing a global partnership for development, including as a target the provision of access to affordable essential drugs

- There is a lack of access to affordable essential drugs for malaria

Abuja Targets by 2005:

- At least 60% of those suffering from malaria should be able to access and use correct, affordable and appropriate treatment within 24 hours of onset of symptoms.
- At least 60% of those at risk of malaria, particularly pregnant women and children under 5 years of age should benefit from suitable personal and community protective measures such as ITNs.
- At least 60% of all pregnant women who are at risk of malaria, especially those in their first pregnancies should receive IPT.

4. Strategic direction for malaria control: 2010/11 – 2014/15

4.1. Strategic approach 1: Malaria Prevention (Vector Control)

The implementation of malaria prevention interventions in Uganda shall be done through an integrated approach (integrated vector management, IVM). The major interventions of IVM include: insecticide treated materials, indoor residual spraying and environmental management programmes (including larviciding). The key objectives for IVM are:

Objective 1: To attain universal coverage with long-lasting insecticide treated nets by the end of 2010 and to sustain thereafter.

Objective 2: To achieve 85% utilization of LLINs within the population.

Objective 3: Sustain a system of at least annual, high quality IRS that covers at least 85% of all targeted structures.

Objective 4: Complement ITN and IRS with selective environmental management (including larviciding) where a significant proportion of breeding sites can be identified and targeted and where measures can be sustained.

4.1.1. Insecticide treated nets

Long-lasting insecticidal nets (LLIN) provide personal protection and when used on a large scale, can have a large impact on the malaria burden in a community. As such, Uganda has adopted a policy of universal coverage with LLINs.

Policy

(i) Any insecticide treated materials sold or distributed for vector borne disease control through the public, civil society or private sectors shall be long lasting (i.e. incorporated or coated with a recommended insecticide during manufacturing and recommended by the WHO pesticide evaluation scheme (WHOPES) as "long lasting").

(ii) With increasing LLIN promotion, there will be no further need for net re-treatment campaigns.

(iii) The immediate priority shall be to increase ownership of and coverage with LLINs, through an integrated approach of free and marketed LLINs to achieve nationwide

universal coverage. Universal coverage is defined as 1 net for 2 people or 3 nets per household.

(iv) Replacement of household LLINs shall be ensured through an integrated approach of routine public sector distribution and private sector sales; replacement campaigns may be conducted after at least three years from the month of the initial or previous campaigns.

(v) There shall be strategic and rigorous communication campaigns to promote correct use of LLINs.

Targets

i. Achieve 100% coverage of households having at least two insecticide-treated net (LLIN) i.e. one net per 2 people

ii. Achieve and sustain LLIN utilisation by all groups at 85% by 2015.

Implementation

To achieve the high coverage targets GoU will facilitate an environment that allows access to a variety of LLINS, through various channels, that take into consideration preferences and economic status of the population. Universal coverage will be achieved through a phased approach, with all partners providing LLINs distributing using the universal coverage approach so as to scale up to achieve national universal coverage. All partners intending to distribute LLINs shall seek guidance from the MOH, and distribution approaches will be standardised.

Building on the successes of previous years and the emerging strong net culture in the population, the National Malaria Control Programme will continue to support a public/private mix approach using all available mechanisms for distribution, sale and promotion of LLINs, namely:

- Free LLINs to households, and especially the vulnerable groups (ANC, under 5/EPI--- this needs further discussion)
- Subsidized sales mainly through civil society
- Commercial sales through the private sector. Distribution of free nets to the public shall be organized in such a manner that the LLIN commercial market will not be adversely affected but rather supported where possible.

In addition, to maintain quality of LLINs available in Uganda, the NMCP will support:

- Phasing out conventional nets, including nets in the commercial sector, and encouraging the use of LLINs;
- Maintaining effective dialogue on tax exemption for LLIN-related materials.
- Ensure replacements LLINs are available in a timely fashion to replace old, damaged nets.

Net ownership does not ensure net utilization, therefore the NMCP will encourage;

- Correct use of LLINs through the various approaches to IEC and, in particular, behavioural change communication (BCC). Monitoring and evaluation of these communication approaches will be carried out to ensure impact of this component and adaptation or improvement if required.

4.1.2. Indoor residual spraying

Indoor residual spraying (IRS) is one of the most effective methods in malaria vector control as its purpose is to eliminate adult mosquitoes. Its continuous use leads to significant reduction in malaria transmission levels.

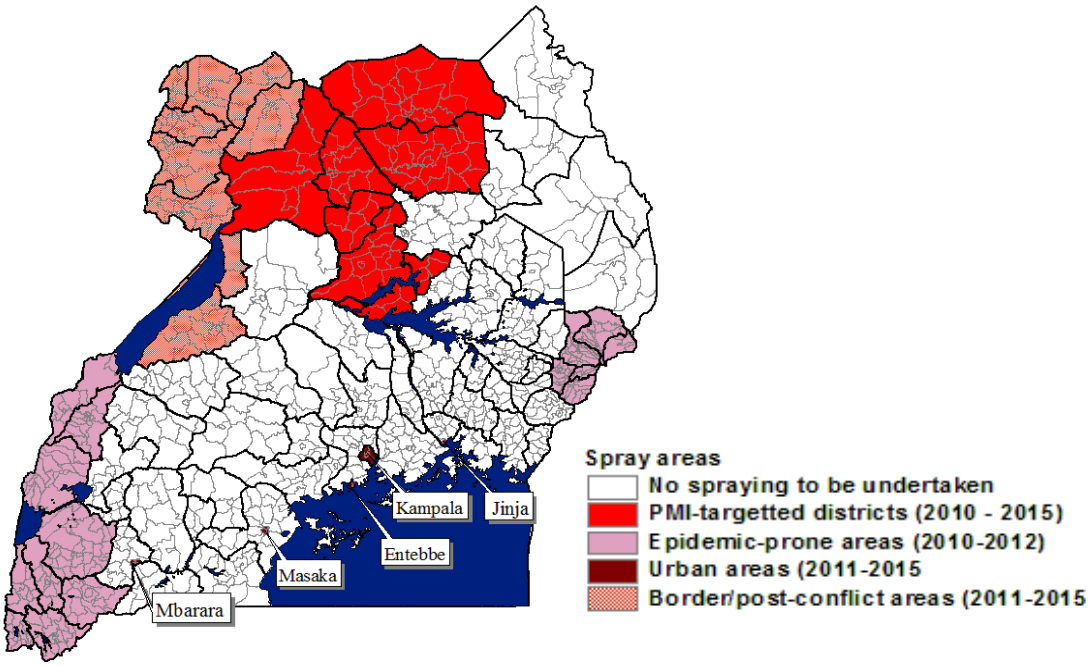
Policy

IRS will be applied in both endemic and epidemic prone areas in a systematically phased manner using WHOPES approved insecticides.

Targets

i. High quality IRS services that cover at least 85% of all targeted structures in areas where IRS is employed, at least annually.
ii. To develop capacity at national and district levels to implement effective IRS by 2012.

Figure 2: Epidemic and border/post-conflict and urban areas targeted for IRS between 2010-2014



Implementation

The major focus for IRS programme will be to rapidly build and strengthen implementation capacity in the public sector in the areas selected for this intervention and to establish a

system for regular (defined as at least annual), high quality IRS services that cover at least 85% of all targeted structures. This process will involve a broad partnership of players from development partners, other line ministries, civil society and the private sector. IRS activities will be initially undertaken jointly by MOH and organisations that have adequate experience in high quality IRS implementation and the related monitoring activities. During that period, NMCP and the Vector Control Division (VCD) will strengthen their expertise and capacity to effectively undertake IRS without technical assistance. This should be achieved by the end of 2012. Over the remaining period covered by this strategy document, IRS activities will be undertaken by NMCP/MOH, districts and communities, without technical assistance, though financial assistance will still be required.

Activities related to the implementation of this strategy include:

- Supervise and monitor importation, distribution, storage, use and disposal of insecticide through the MoH and use the NDA and National Environment Management Authority (NEMA) guidelines and procedures.
- Establish structures and systems for managing IRS activities from the national to the sub-county level.
- Develop systems for geographic mapping of structures in districts selected for IRS.
- Use evidence of insecticide resistance patterns and other relevant operational research findings to guide IRS.
- Establish a multi-sectoral Monitoring and Evaluation Task Force to ensure the safe and correct application of residual insecticides and safe disposal of the byproducts.

Insecticide resistance will be regularly monitored to inform decisions choice of insecticides used in IRS. The insecticide to be used in IRS will be determined by GoU as guided by the NMCP/VCD, after careful evaluation of all aspects including

- resistance patterns of local vector populations (including consideration of prevention of resistance)
- cost-effectiveness
- environmental impact
- management aspects
- acceptability by the population

IEC and social mobilization will play a significant role for the success of this intervention.

4.1.3. Environmental control

Where appropriate, reduction of vector breeding will be carried out either through physical reduction or alteration of sites (e.g. brick pits, drainage channels) or through larval control using larvicides, predators, or growth inhibitors.

The Department of Environmental Sanitation is charged with environmental management and will undertake efforts to minimize breeding sites, where possible. The NMCP will provide guidance as necessary.

4.1.4. Monitoring of Quality of Insecticides, Larvicides and Mosquito Nets

The quality of public health insecticides and mosquito nets will be regularly monitored by the National Drug Authority (NDA) and Uganda National Bureau of Standards (UNBS) in collaboration with relevant regulatory and enforcement agencies. The selection of LLINs and insecticides for public sector procurement will be guided by international standards (WHOPES recommendations). This will minimise the importation or sale of substandard public health chemicals and products. Support will be given to NDA and UNBS to implement their mandates.

As much as possible these measures of vector control will be integrated with the control of other vector-borne and/or neglected diseases and involve other line ministries and departments such as Agriculture, Water and Sanitation, Environment, Works, Education, Trade & Industry who have a stake in vector control activities.

4.2. Strategic approach 2: Effective Diagnosis and Treatment

Government of Uganda has set itself 2 main goals relating to this strategy, namely: (a) To ensure early diagnosis and prompt, effective treatment of malaria using ACT, within 24 hours of the onset of symptoms; and (b) To ensure that all malaria diagnosis is supported by parasitological diagnosis, where feasible. Parasite-based diagnosis with microscopy or rapid diagnostic tests (RDTs) shall be part of malaria case management in all health facilities. The GoU will ensure that all people at risk of malaria have access to IEC to improve fever recognition and promptly seek treatment, and that those managing the disease will have the necessary IEC and inputs to undertake accurate parasitological diagnosis and to provide effective management of uncomplicated/severe malaria. The key objectives for this strategy include:

Objective 5: Increase the proportion of malaria cases confirmed by high quality parasitological diagnosis from 15% (2008/9) to 85% by 2015.

Objective 6: Ensure 100% access to Artemisinin-based combination therapy (ACT) by all people including those accessing treatment through the commercial sector by 2015.

Objective 7: By 2015, increase the proportion of children under 5 receiving prompt treatment within 24 hours of fever onset (at all health care levels, including the community level) using ACTs to 85%.

4.2.1. Malaria Diagnosis

In Uganda, most treatment of malaria relies on clinical diagnosis. Current predictions indicate that fever episodes are likely to reduce at an annual rate of 5- 10% between 2011 and 2013 and to steadily decrease at a 10% rate for the next five years, as a result of a scale up of interventions such as the LLINs and IRS. As this happens, definitive diagnosis, when used correctly, will increasingly become a more cost effective option for the rational use of ACTs. Developing a culture of systematic use of routine parasitological diagnosis as part of case management is one of the rational directions to take in effective case management. Laboratory diagnosis by microscopy continues to be the method of choice-the gold standard- for confirming a clinical diagnosis of malaria and epidemiological studies (WHO 2000a, 2004a). However, Rapid Diagnostic Tests can provide the much-needed access to diagnosis in remote areas where laboratories are not available or functional. Currently Uganda is in the process of scaling up diagnostic services, with support from Global Fund, and other partners in development.

Policy

Suspected malaria cases will be subjected to parasite-based diagnosis. Implementation of diagnostics at community level needs further research. The two methods to be used for parasitological diagnosis of malaria in routine fever case management in Uganda are microscopy and RDTs. The choice between RDTs and microscopy will depend on local circumstances, the level of health care including the skills available, the usefulness of microscopy for diagnosis of other diseases, and the health system infrastructure for laboratory services in the country.

Microscopy:

- Microscopy remains the reference standard and is recommended for malaria diagnosis at all levels health facilities.
- Binocular microscopes, Leishman and Giemsa stains are the recommended products for malaria microscopy in routine parasite based diagnosis of malaria

Malaria RDTs:

- Rapid Diagnostic Tests (RDTs) will be deployed in all Health Centres II and any other health facilities where deployment and/or functionality of microscopy may not be possible.
- The type of RDTs to be deployed in the country will be guided by evidence on sensitivity, specificity, ease of use and stability in the field, as determined by the performance evaluation and pre-qualification schemes of the WHO.

Targets

To improve fever management in public health facilities by ensuring parasite based malaria diagnosis so that the proportion of laboratory confirmed malaria cases increases from 15% to 85 % by 2015.
Target for microscopy?
Target for RDTs?

Implementation

The NMCP, together with partners, will enhance the capacity of laboratories to undertake microscopy at health facilities where laboratory services exist. The capacity of laboratories (at all levels of care) will be strengthened through training and re-training of lab staff, increased staffing, provision of required reagents and supplies, provision and proper maintenance of microscopes, and regular supervision. In health facilities areas where microscopy is not feasible or cost-effective, rapid diagnostics will be used. NMCP, with support from its Partners, has adopted appropriate training guidelines for the use of RDTs based on evidence. Training of staff on the use of RDTs will be cascaded nationwide, to ensure that all health facility based clinicians and lab staff are in position to diagnose malaria using RDTs. All facilities without labs will be equipped with RDTs, and staff will be trained on how to manage patients with negative RDT results.

The NMCP and CPHL are in the process of peer reviewing and documenting evidence based national Quality Assurance plan for malaria diagnostics, which will govern overall QA/QC for microscopy and RDT implementation on routine basis.

4.2.2. Management of uncomplicated malaria

Providing prompt and highly effective anti-malarial combination therapy for uncomplicated malaria episodes will complement efforts of malaria prevention by:

- Reducing the number of cases progressing to severe malaria;
- Preventing or at least delaying development of parasite strains resistant against used anti-malaria combinations;
- Contribute to reductions of malaria transmission by reducing the reservoir of parasite stages transmissible by the mosquito vector (gametocytes).

The current situation in Uganda: challenges of absence of ACTs in the last 8 months; existing logistical/chain supply problems; challenges in the private sector; polypharmacy etc.

Policy

This strategy will (a) enhance the prompt treatment of children under 5 within 24 hours of fever onset through all levels of health facilities including home-based management of malaria fever using ACT and (b) ensure access to Artemisinin-based combination therapy (ACT) by all people including those accessing treatment through the private sector. The focus

of this strategy is to progressively phase out the availability and use of mono-therapies and non-ACTs for uncomplicated malaria, while rapidly providing access to treatment with ACTs for all segments of the population, including:

- Those being served by public and NGO health facilities
- Those accessing treatment for children under 5 through the community distribution system for medicines, HBMF
- Those being served by the private for profit health care sector

The first line treatment for uncomplicated malaria is an ACT, currently artemether - lumefantrine (AL). Any other ACT that has been recommended by WHO & MoH and registered with the National Drug Authority (NDA) will be the alternative first line. The second line treatment shall remain quinine for all patients, until other suitable alternatives are found. When dihydroartemisinin/piperaquine becomes qualified by World Health Organisation, it is a potential alternative second line, (except for children below 4 months/5kg and pregnant women in the first trimester). The first line medicines for uncomplicated malaria shall be the drug of choice for *Home Based Management of Fever* (*HBMF*). A basic motivational package shall be provided for Community Medicine Distributors (CMDs) within Village Health Teams (VHTs), including adequate supervision through quarterly review meetings.

Targets

i. By 2011, 85% of GoU health facilities will have no stock-out supplies of drugs essential for the management of malaria. This shall be sustained through to 2015.

ii. By 2011, 80% of all antimalarials provided through formal and informal sectors will be of internationally acceptable pharmacological standards.

iii. By 2015, 85% of fever cases which are treated at private and public health facilities or at home by family members or caretakers will be managed appropriately, using ACTs.

iv. By 2015, 85% of all cases of fever treated by CHWs or out-patient facilities will be managed according to national recommendations, using ACTs.

v. Proportion of children under five receiving correct treatment according to national treatment guidelines within 24 hours of onset of symptoms, will be increased from 55% to 85%, by 2015.

Implementation

ACTs will be used to treat uncomplicated malaria in the non-pregnant population through the public health sector including the HBMF programme free of charge. There are ongoing global initiatives to functionalise an ACT subsidy in the private for profit and private not-for-profit health sectors. In the interim efforts are being made to enable the private for profit

sector to provide quality assured ACTs to confirmed malaria cases at the lowest possible price.

Ensuring adequate supplies and increased distribution of antimalarials

Implementation of this strategy requires substantial, consistent and predictable external funding if the planned high targets have to be achieved. NMCP, with support from Partners, will endeavour to have accurate quantification of need (for ACTs) and to undertake efficient procurement that allows for consistent supply of antimalarials at all times, while at the same time minimising expiries of antimalarials at all levels.

Health facilities and DHMTs will be responsible for defining supply requirements in their areas. The NMCP, with support from Partners, will advise on and lobby for the procurement, packaging and distribution of all necessary supplies for all levels of the formal health sector. The MOH, with technical support from the NMCP, will be responsible for ensuring that National Medical Store or other appropriate organisation procures and retains buffer stocks for epidemics. Districts will be responsible for monitoring drug supplies and distribution to the formal sector. The NMCP will support the monitoring of national supplies, identifying and dealing with obstacles to distribution and negotiation with MOH, GoU and development partners to fill national resource gaps.

In addition, a system for reporting stock-outs of antimalarials and for quick replenishment of stocks will be developed. Health workers, at all levels, and community medicines distributors will be re-trained and sensitised about quantification of need, reporting of stock-outs and requesting for supplies. The capacity of National Medical Stores will be strengthened to enable them to be more efficient in handling orders for antimalarials from all levels of care and all parts of the country.

Drug donations

The NMCP, with support and advice from relevant technical structures/agencies, will ensure that proposed drug donations are in concert with the national treatment guidelines and internationally accepted guidelines on drug donations.

Drug registration, legislation and quality

The quality of antimalarial medicines will be regularly monitored by the NDA in collaboration with relevant regulatory and enforcement agencies. This will minimise the importation or sale of substandard and fake antimalarials. NDA will be supported in terms of its capacity to carry out its mandate. In addition, NMCP will work with all regulatory and enforcement bodies to monitor the quality of antimalarials on the market and in the private (formal and informal) sector. Registration, legislation and Regulation of In-vitro Medical Devices (RDTs) for malaria is on-going. Currently, the NDA medical devices working group is in the process of finalizing the national RDT regulatory guidelines and implementation plan, which will include post-market surveillance and QA for malaria diagnostics.

Monitoring drug efficacy and safety

In 1998 the East African Network for Monitoring Anti-malarial Therapy (EANMAT) was established with donor and national Government support to initiate eight sentinel sites in each of the three East African countries for the standardised and routine monitoring of anti-malarial drug sensitivity. Uganda being a member of the EANMAT, the NMCP maintains 9 sentinel sites through the UMSP. Results feed into the wider sub-regional initiative. Findings from the sentinel and other sites will continue to be reviewed regularly and reports and recommendations presented to relevant stakeholders and at various fora. All information on levels of drug resistance will be made public through the NMCP web-site and other communication channels. The MOH will ensure mechanisms are in place to continue sentinel site testing in Uganda. The currently published Methods for surveillance of antimalarial drug efficacy (WHO 2009) will continue to guide the implementation process of the antimalarial medicines efficacy surveillance.

The Malaria Control Programme together with its partners in the research community will continue to monitor drug sensitivity and efficacy of antimalarial drugs in current use[4] and test potential future alternative antimalarial drugs which might provide better or more cost-effective options. Any changes in the resistance or safety patterns as well as possible new drugs will be incorporated into a revised treatment policy if this is thought necessary after careful consideration and consensus building by all relevant stakeholders. The role of the East African Network for Monitoring Antimalarial Treatments (EANMAT) in these activities in the monitoring of drug efficacy remains vital.

Improved case-management by service providers

Guided by empirical (local and international) evidence, the NMCP will periodically review and update, treatment guidelines, training modules and reference materials on malaria diagnosis and treatment. Such materials will be disseminated by DHMTs to clinicians, pharmacists, nurses and laboratory staff working in public and private health facilities. The NMCP will continue to collaborate with Partners to upgrade health worker's knowledge on malaria case management and to develop curriculum updates. This includes health worker in the public, private-not-for-profit and private-for-profit sectors. The NMCP will liaise with pre-service training curricula for medical and para-medical personnel to ensure consistency with, and give appropriate emphasis to, national malaria policy.

The NMCP and District Medical Officers (DMOs) will work together to develop a critical mass of trainers to build capacity for clinical management, supervision and continuing education at lower levels. District Medical Officers will drive the development and implementation of their district health work plans and ensure malaria-specific capacity building and case-management activities are included. The NMCP will work with those

[4] including SP used for IPT

responsible at national level for Integrated Management of Childhood Illnesses (IMCI) and Safe Motherhood to ensure new developments have a strong malaria component and that implementation of the Strategy, IMCI and Safe- Motherhood Programmes are co-ordinated and make effective use of resources.

The National Public Health Laboratories (NPHL) will be responsible for general improvements in the provision of microscopy as a diagnostic tool and Hb measuring services nationally. Technical advice will be provided by the NMCP to support the NPHL's efforts to strengthen laboratory services nation-wide.

A regulatory framework for medical practitioners and private hospitals will be strengthened, aiming at ensuring adherence to medical ethics, national policies and treatment guidelines.

Fundamental to the success of this strategic approach is the confident and correct use of appropriate drugs and services by the community. To this end, a large-scale investment will be made to ensure communities (including community medicines distributors and village health teams) trained in identifying the symptoms of malaria and in effectively treating malaria using the nationally recommended first-line antimalarials and antipyretics. This is particularly critical for the success of the home-based management of fever strategy that targets children less than 5 years.

Awareness among client community

In order to improve effective case management, it is vital that care-seeking behaviour is changed. To this end, effective communication approaches will be used to increase knowledge about treatment seeking among the population. The malaria communication strategy will support innovative behavioural change, with particular focus on mothers, caretakers of children and decision-makers in households and communities. The communication strategy will continue to be delivered using a variety of approaches, including: the use of mass media, print media, inter-personal communication, and use of community awareness schemes through the community-based interventions.

The informal private sector

The NMCP recognises the need to improve self-treatment practices by:

- Increasing awareness of appropriate action among the community as a whole through various IEC and BCC strategies
- Developing and applying strategies for improving dispensing practices by shop-keepers and other important health providers in the community, such as traditional healers
- Ensuring appropriate drug legislation to allow for easy access to effective antimalarials, and
- Maintaining effective regulatory control of antimalarial products in the community

Districts will have an important role in planning and implementing the awareness and dispensing elements, with support from the Zonal Malaria Focal persons and from the NMCP.

4.2.3. Management of severe malaria

Policy

Reduce case fatality of severe malaria by establishing a system to provide highly effective pre-referral treatment and improve the management capacity for severe malaria at health facilities and hospitals.

Targets

i. Case fatality rate among malaria in-patients under five years of age reduced from 3% to less than 1 % by 2015.
ii. 85% of first-line therapeutic failures and severe, complicated malaria cases to be correctly managed by health personnel in appropriate health facilities by 2015.

Implementation

In spite of all efforts to reduce malaria infections and prevent progression of uncomplicated malaria to complicated forms of the disease, severe malaria will still occur. A second focus of the case management strategy will, therefore, be the management of all forms of severe malaria (cerebral malaria as well as severe malarial anaemia). This will be done through 3 interventions, with the aim of reducing case fatality of severe malaria and improve the management capacity for severe malaria at health facilities and hospitals:

- establish a system that tracks and appropriately refers fever cases diagnosed as severe malaria
- Introduction of suitable and easily applicable and highly effective pre-referral treatment (e.g. rectal Artesunate) at peripheral health facilities (HC II) as well as at community levels (in HBMF) where this can be shown to be feasible and effective;
- To strengthen clinical capability for complicated malaria at all health facilities in Uganda, through:
    - Improving availability of safe blood and blood products for transfusing severely anaemic patients as well as other relevant IV fluids, necessary antimalarials including quinine and injectable Artesunate, and ancillary treatments;
    - Improvement of the management of severe disease at higher level health facilities (HC III & IV) and hospitals which not only involves availability of medicines and commodities but also skills and processes including patient triage.
    - Providing support supervision and monitoring

- Improve the referral system by provision of transport availability, communication etc.

Given the priority need for blood and blood products, the NMCP will liase with the National and Regional Blood Banks to ensure a reliable and high quality service.

4.3. Strategic approach 3: Malaria in Pregnancy

Malaria in pregnancy represents a significant burden on the health of both mother and child. Malaria is a major cause of anaemia in pregnant women and increases the risks of severe morbidity and maternal death. Malaria infection during pregnancy poses a risk to the unborn child and, for surviving births, leads to a decreased birth weight. To mitigate this impact, strategies for protecting and effectively treating pregnant women are necessary. The key objectives set out for the Malaria in Pregnancy (MIP) strategy include:

Objective 8: Increase coverage of pregnant women taking intermittent preventive treatment (IPT), using Directly Observed Treatment (DOT), among pregnant women attending public as well as private sector health services as part of a comprehensive reproductive health package implemented during focused ANC services.

Objective 9: Increase the percentage of pregnant women using LLINs to 85% by 2015.

Policy

In order to reduce maternal morbidity and mortality and improve the newborn's chances of survival malaria in pregnancy will remain an essential part of the malaria control strategy in Uganda, and will include these interventions:

(i) All pregnant women shall have access to cost-effective preventive interventions including LLINs and IPTp.
(ii) IPTp will consist of at least two doses of sulfadoxine-pyrimethamine given at a minimum of one month apart.
(iii) All pregnant women who present with suspected malaria shall receive prompt diagnosis and effective case management using quinine during the first trimester and ACT during the second and third trimesters.
(iv) Prevention and effective treatment of anaemia in pregnancy

These will be provided to pregnant women free of charge in the public sector.

Targets

i. During the five-year period, the proportion of pregnant women attending ANC services who have received IPT2 increased from 33% to 85%.

ii. The proportion of pregnant women sleeping under treated nets during their confinement to be increased to 85% by 2015.
iii. The proportion of pregnant women with fever or anaemia cases who are appropriately managed at ANC services to gradually increase to 85% by 2015.

Implementation

Pregnant women will receive two free SP treatment doses at least one month apart, one in the second trimester of pregnancy and one in the third trimester or other prophylactic drug regimen which may evolve. IPT will be implemented using a Directly Observed Treatment (DOT) strategy. The delivery of IPT will be part of focused ANC services coordinated by the reproductive health programme of the MOH. Emphasis will be on at least 4 visits for each pregnant woman in order to provide all the services needed and allow timely delivery of at least two doses of IPT. Improvements in quality of service delivery will be accompanied by strengthening of the data recording practices in order to provide a realistic picture of increasing coverage rates. The special needs of women living with HIV/AIDS with respect IPT will be addressed in close collaboration with other programmes (recommended: 3 doses one month apart in 2nd and 3rd trimester except those on cotrimoxazole prophylaxis treatment). NMCP and the RBM country partnership will follow closely the development of the international search for alternative medicines that can be used for IPT and update its policy if this is considered adequate. Delivery of IPT through community structures will be explored.

Pregnant women will be targeted for the distribution with LLINs particularly through ANC services, as well as through mass campaigns. This is expected not only to increase the protection of this vulnerable group but also help to improve the uptake of ANC services in general. Intensive communication efforts to ensure the regular utilization and correct use of the LLINs will be undertaken.

Treatment of clinical malaria cases during pregnancy and the management of severe malaria are part of the general approaches towards case management. The special situation and treatment needs are addressed in the malaria treatment policy and will continue to be the focus of health staff training and supervision.

4.4. Strategic approach 4: Malaria Epidemics

Frequent exposure to epidemics in the highland areas affects approximately 10% of Uganda's population. Preparedness is the key to timely prediction, recognition and prompt control of focal epidemics of malaria. Epidemics or complex-emergency situations require responses that would not otherwise be recommended nationwide. Emergency response usually comprises (a) capacity for timely response to malaria outbreaks and emergencies in order to minimize their magnitude, duration and associated morbidity and mortality; (b) adequate preparedness in terms of contingency plans, emergency drug stocks and pre-positioning of malaria control supplies (equipment, insecticides and drugs). There is need to strengthen

national capacity to appropriately prepare for and efficiently respond to such emergencies. The key objective for this strategy is:

Objective 10: Prevent epidemics of malaria in areas of very low and/or unstable malaria through regular application of IRS and strengthen the system of prediction, early detection and prompt response in epidemic prone areas.

Policy

The NMCP will establish a comprehensive system for effective malaria epidemic prevention and adequate response. Together with Partners, NMCP will spearhead a set of interventions at different levels: first of all a system for malaria epidemics forecasting, early warning and early detection will be set up; subsequently, adequate preparedness plans will be developed and an effective response system will be put in place at different levels, to contain malaria outbreaks and epidemics in order to reduce associated mortality.

Targets

i. The capacity of NMCP for prediction, early detection, and appropriate response to malaria epidemics or emergencies strengthened.
ii. 85% of epidemic prone districts will have an early warning and detection system for local malaria epidemics.
iii. 85% of districts will respond to reliable warning signals.
iv. 80% of confirmed epidemics will be effectively contained through selective interventions, including community mobilisation, effective case management, LLINs and/or IRS.

Implementation

As described under the vector control section, active prevention of epidemics using IRS will be introduced in the epidemic prone areas as the primary strategy. In addition, emergencies and epidemics will be predicted early, and will be promptly and effectively handled with the aim minimise potential morbidity and mortality related to them.

In all epidemic prone areas the existing programme for epidemic preparedness and response will be reinforced, focusing on forecasting, early detection, confirmation and appropriate response. This will be achieved through close collaboration between the NMCP and the meteorological services, awareness creation, training and supervision and the provision of emergency stocks as needed (RDTs, antimalarials, insecticides, equipment). Districts will be supported with the required resources and capacity to respond, including:

- Developing district level malaria epidemic plans
- Establishing and using an early warning system

- Mapping epidemic prone villages and monitoring malaria cases in the villages
- Ensuring adequate buffer stocks of drugs, insecticides and other essential supplies

In addition, the NMCP will establish an emergency fund, keep emergency stocks of drugs, supplies and insecticides and set up a sensitive early warning system that is not only dependent on malaria cases. During epidemics NMCP will ensure prompt mobilization and distribution of resources, swift sharing of information, and easy mobility of patients to treatment centres.

From a regional perspective, it is important to note that cross-border spread of malaria is significant and inter-country cooperation is needed for effective control of cross border malaria epidemic threat. Rapid response teams, intelligence systems, timely exchange of information and management of the supplies needed for control of epidemics are important measures to contain the epidemics. Software for prediction and early recognition of the epidemics is available, and will be sought (if funding is available).

4.5. Operational strategies – 1: Advocacy, IEC & Social Mobilization

Advocacy and Social Mobilization are means of increasing individual and collective participation in health action and strengthening interventions, through an integrative use of various methods in malaria control. Information, education, communication and social mobilisation are essential for each of the control and prevention strategies outlined in the previous sections. The NMCP recognises that effective IEC forms the foundation of any efforts to effectively change service-provider skills, community behaviour and overall demand for effective services. Over the next five years, the key objectives for this strategy are:

Objective 11: Raise the profile of and demand for malaria control interventions through targeted, well designed advocacy and communication campaigns and activities with special emphasis on the biologically and economically vulnerable.

Objective 12: Support active community participation in malaria control and prevention activities

Policy

The GoU will ensure all Ugandans have access to appropriate, accurate and culturally relevant information about malaria control and management, so that effective and desired behavioural change is achieved. As such, the NMCP will ensure effective mobilisation and active participation of communities, local, regional and national as well as political, cultural

and religious leaders to play an active role in malaria control. The key purpose of advocacy, IEC & social mobilization is to ensure proper understanding and ownership of the core interventions by the population and to promote desired change of behaviour. MOH shall guide, recommend and approve all health education and promotion initiatives in malaria control. Malaria control messages shall conform to MOH policies.

Targets

i. To increase understanding about malaria, its causes, recognition of signs and symptoms, treatment and prevention.
ii. To increase the proportion of people who recognize danger signs and know where to go for treatment.
iii. To ensure 80% of households nation-wide have received targeted IEC on all key messages to support the four key malaria control strategies (described previously), by 2015.

Implementation

The existing communication strategy for all aspects of malaria control 2005/6 – 2009/10[5] will be updated by 2010 and the revised version of this will form the basis of activities in the next 5 years in order to:

- Advocate for policies and resources supportive of malaria control
- Communicate all malaria control policy changes
- Educate communities and health providers about home-based management of fever
- Improve the quality of health care (e.g., counselling and client information)
- Create demand for malaria services and products
- Improve client compliance with diagnosis and treatment
- Change household practices (e.g. LLIN use, IPT, environmental management and early treatment of fevers in children)
- Involve communities in malaria control

Uniting all partners and stakeholders from the public and private sectors to ensure dissemination of an updated malaria communication strategy, the NMCP in close coordination with the Department for Health Education and Promotion of the MOH, will intensify efforts to provide adequate, high quality messages and advocacy at all levels of society and making use of the whole array of media and communication channels.

Operational research will be undertaken to improve current understanding of behavioural patterns and the perception of particular messages by the target group. This will guarantee a continuous improvement and adaptation of communication efforts to changing demands as the implementation of malaria control progresses.

[5] The Uganda Communication Strategy for Malaria 2005 – 2010.

Although IEC and social mobilisation is a cross-cutting strategy for the key malaria control interventions, in this strategic plan it will be considered a core intervention in its own right in order to emphasize its importance and ensure that sufficient resources are behind it. IEC and BCC indicators will be captured in the comprehensive M&E plan.

4.6. Operational strategies – 2: Health System strengthening

A health system is the sum of all organizations, institutions and resources whose primary purpose is to improve health. The building blocks of a well-functioning health system include good health service delivery, a well-performing health workforce, a well-functioning health information system, a well-functioning system for providing pharmaceuticals, health products and technologies equitably, good health financing systems and effective leadership and governance. Health systems strengthening (HSS) refers to initiatives and strategies that improve one or more functions of the health system as well as the interactions between them leading to better health through improvements in access, coverage, quality and efficiency.

Specifically for malaria control, health system strengthening includes improving the quality of parasitological diagnosis; ensuring continuous supplies of adequate and high quality first line antimalarials, and antimalarials and supplies for the management of severe malaria; improved leadership and governance to ensure timely, efficient and equitable implementation of malaria interventions; strengthening existing systems for collection, collation and use of information on malaria; enhancing the capacity of technical structures involved in decision-making and implementation; improving the functionality of the monitoring and evaluation unit; and building the capacity of NMCP to track and review resource allocation and use. The key objectives for health systems strengthening include:

Objective 13: *Leadership and governance*: Strengthen the leadership role of the NMCP to ensure that malaria resources are competently allocated in a way that is transparent, accountable, equitable and responsive to the needs of the people through one partnership to ensure one strategic plan and one coordinating mechanism.

Objective 14: *Service delivery* : Contribute to the strengthening of a decentralised health system that can deliver quality services and effectively manage supplies through the NMCP activities

Objective 15: *Medical products, vaccine and technology*: improve the partnership and collaboration between NMCP with NMS, JMS, NDA, UNBS and UBTS to ensure quality and reliable supplies of malaria commodities.

Objective 16: *Health workforce*: Strengthen the capacity of health workforce at health facilities to appropriately diagnose and treat malaria, as well as the capacity of malaria zonal coordinators,

malaria focal persons, and village health teams to promote and coordinate malaria control activities at district, health sub-district, sub-county and community levels.

Objective 17: *Malaria information*: Enhance the collaboration between NMCP and HMIS, to ensure timely collection of malaria-related information from districts; and to enhance the capacity of the M&E Unit of NMCP to appropriately synthesise malaria information from various sources (including HMIS) and to package it in ways in which it can be used to inform decision-making and policy development, as far as malaria control in Uganda is concerned.

Objective 18: *Financing and Resource allocation*: Develop the capacity of NMCP to regularly conduct malaria spending assessments, with the view to assess critical issues pertaining to resource allocation, efficiency and equity, and to use this information appropriately for fund raising, budgeting and planning.

The NMCP will strengthen its links with other RBM partners as well as other departments within the Ministry of Health and seek synergies with other programmes. As much as possible existing mechanisms for supply management, supervision and human resource development will be used and improved where needed jointly with other partners in the public and private sectors.

Technical support supervision by the NMCP and malaria zonal coordinators will be strengthened to ensure proper implementation and monitoring of malaria control activities at district level.

Particular emphasis will be put on the support to the district operations, malaria focal persons, zonal coordinators and the central level. This will include collaboration with other programmes such as Child Health, Environmental Health, Reproductive Health and others. It will enable them to undertake support supervision at health sub-district, sub-county, health facility and community levels and coordinate various partners from civil society and private sector at district level. Parish Development Committees and Village Health Teams will be supported by the district and sub-counties in their efforts to engage the communities actively in malaria control activities.

Quality assurance will be supported in an integrated way at all levels of health care. However, special efforts will directed at the strengthening of those regulatory bodies that need to ensure the quality of malaria medicines, ITNs and the insecticides used for malaria control, namely the National Drug Authority (NDA) and the National Bureau of Standards (UNBS).

4.7. Operational strategies – 3: Monitoring & Evaluation and Research

Monitoring and evaluation is an integral part of the programme implementation cycle. Public health interventions are successful when they are based on evidence. The main purpose of this strategy is to measure progress and achievements; detect problems and provide information required for improvement in implementation of interventions. The main objectives for this strategy are:

Objective 19: Improve collection, quality and utilization of routine malaria data (Health Management Information System, HBMF, weekly epidemiolocal data) and data from other sources including Malaria Indicator Surveys, Demographic Surveillance System (DSS), sentinel sites and the private sector, in order to monitor implementation and impact of malaria-related interventions.

Objective 20: Strengthen links between the malaria research community and RBM partners in order to ensure that ongoing research is coordinated and oriented towards integrated operational research questions and that relevant evidence is continuously generated and disseminated appropriately to guide decision-making and policy formulation.

The Malaria Control Strategic Plan commits the nation to a comprehensive assessment of the malaria programme's performance and health and economic impacts. This will require that the basic health information systems are strengthened and that new capacity is developed for the collection, analysis, and timely dissemination of coverage and impact data, as well as developing new knowledge through operational research.

The key functions and actions of the Uganda malaria M&E system have been developed and continue to be strengthened within the context of general health and disease M&E systems in Uganda, and systems are increasingly able to ensure that challenges and opportunities that arise at national, provincial, and district levels are addressed promptly to support the national commitment to rapid scale up of malaria programming for impact. NMCP will continue to utilise HMIS and HBMF for information that is routinely collected, as well as other mechanism to obtain relevant data. This includes the DHS conducted every 5 years and the MIS conducted every 2 years. In order to enhance its ability to monitor progress, the NMCP will also utilize results from non-national, smaller scale surveys, as well as data from the private sector. The NMCP will work with all RBM partners to ensure that indicators and assessment tools are standardized as much as possible. The comprehensive M&E plan (2008 – 2010) for malaria control will be used to guide all M&E activities.

Operational research is an integral part of programme implementation and M&E. As new technologies introduced and interventions are implemented, their outcomes and impact need to tracked, assessed and documented. A National Malaria Research Centre has been

established. The NMCP will work in collaboration with this Centre, RBM as well as other research and academic institutions to develop a malaria research agenda, raise funds for malaria research, conduct operational research and timeously disseminate research findings. Areas of operational research will include, but not be restricted to:

- Monitoring of drug sensitivity of currently used malaria treatments as well as candidates for future use for uncomplicated malaria, severe malaria, IPT, HBMF etc.
- Monitoring of insecticide resistance to local vectors and other entomological studies
- Assessment of environmental impact of vector control interventions
- Quality of IRS and ITNs
- Impact of BCC interventions including compliance and user satisfaction

4.8. Operational strategies – 4: Resource mobilisation & allocation

Mobilisation for adequate resources and the efficient use of resources are essential for successful implementation of malaria interventions. On one hand, there is need to document and monitor the amounts of resources available for malaria control, and the way these resources are allocated and used. On the other hand, the assessment of efficiency and cost in relation to the outcome is necessary. These aspects of the programme management will lead to understanding how financial resources are leveraged in order to yield optimal impact. Appropriate analyses need to be regularly conducted to determine the most desired resource mix (between the different interventions) that provides the highest positive impact on malaria control. Similarly, ascertaining how and what resources and resource mix approaches can be implemented will further provide insight into the programme management and process.

Objective 21: Advocate for increased resources allocated for malaria control, as well as establishing innovative mechanisms for raising additional resources.

Objective 22: Regularly undertake a comprehensive documentation of resource available for malaria control activities, as well as conducting relevant analyses on resource allocation and use to assess efficiency

The costing and financing analyses of the Plan will be developed based on a systematic review of critical programming approaches. In the first year of this Plan, appropriate Costing Tools will be used to obtain the baseline information on resource available and resource allocation. In subsequent years there will be an annual documentation of available resources. The key assumptions and costing outputs will be integrated in the monitoring and evaluation system for the program to assure that there is consistent monitoring of how key costing assumptions vary over time.

NMCP will work with partners and research institutions to collect baseline information on a National Malaria Spending Assessment, which includes an assessment of allocation of resources between interventions and other areas of interest. The information collected will form the basis for more strategic resource allocation in the subsequent years.

5. Institutional structures for implementation

The implementation of this strategic plan will be a joint effort by all partners and stakeholders at all levels of society. Mechanisms of implementation will be multiple:

- Through the public health system and other public services (e.g. Ministry of Education) within the decentralized system of government
- Contracted out by development partners or government to civil society and private sector
- Directly undertaken by civil society or private sector

While each implementing partner may have their own rules and regulations regarding implementation, accountability and reporting there is only **one strategic plan** under which all partners work and contribute towards, **one coordination mechanism** to ensure maximum synergy and avoidance of duplications, and **one M&E plan** to measure progress and assess impact ('the three ones').

5.1. Coordination mechanisms

The Ministry of Health in general and the Malaria Control Programme in particular has the leading role of coordinating efforts to control malaria. The NMCP will also ensure that malaria control is adequately represented within the overall health sector coordination mechanisms such as the Health Policy Advisory Committee (HPAC), the bi-annual joint review missions, the Health Sector Working Group and the annual National Health Assembly.

All partners involved in malaria control form the Country Roll Back Malaria Partnership. The central coordination mechanism for this partnership is the Interagency Coordination Committee for Malaria (ICCM) which is chaired by the Ministry of Health and supported by four technical working groups (see Annex 1). As a consequence of the experience of the past 4 years the NMCP will initiate a process of discussions and consultations on an improved structure and/or management of the ICCM in order to improve its effectiveness. The NMCP will also reinforce the regular meeting of all TWGs. Within each partner group other coordination mechanisms exist to ensure that discussions and decisions from the ICCM are communicated within the respective constituencies and vice versa that any concerns or other matters are brought to the attention of the ICCM.

5.2. Partners and their roles

5.2.1. Central and Local Governments

The leading partner is the Malaria Control Programme within the Ministry of Health with the various levels of management and of decentralized implementation through the zonal coordinators, district and sub-health district teams and their malaria focal persons or coordinators and the Vector Control Officers. Harmonisation between the activities of this Strategic Plan and the DHMT activities will empower the District Medical Officers (DMOs) and Malaria Focal Persons (MFPs) to establish clear mechanisms for malaria control. Other departments within MOH (e.g. Planning, Health Education and Promotion, Community and Reproductive Health, Resource Centre) together with parastatal institutions (e.g. NDA, UNBS) also significantly contribute to a successful implementation.

Their roles are to

- Insure adequate representation of malaria control in national and district plans with technically sound interventions as outlined in the malaria control strategy
- Deliver quality preventive and curative services.
- Ensure adequate capacity building of staff
- Coordinate efforts of implementation as well as M&E with other partners
- Provide technical support and supervision
- Ensure quality of products used for malaria control
- Lead the response in case of outbreaks or epidemics

A number of other line ministries and their structures in the districts are crucial partners including Ministry of Education and Sports, Ministry of Gender and Social Affairs, Ministry of Agriculture and Fishery, Ministry of Works, Ministry of Finance, Planning and Economic Development as well as the Army and Police.

Their roles are to

- Integrate malaria control into work plans where this is useful and feasible
- Contribute to resource mobilization and promotion of behavioural change

Finally there are the **political leaders and decision makers** at national (Cabinet, Parliament, parties) and district levels (Local Councils and Urban Councils)

Their roles are to

- Provide political leadership and advocate for malaria control as a cross-cutting effort within the context of the national control strategy

- Ensure adequate resource mobilisation for, and allocation to malaria control
- Ensure adequate legislation (including bye-laws), regulation and incorporation of malaria concerns where necessary (e.g. construction sites, drainage systems, brick pits).

5.2.2. Civil Society

Civil society organizations comprise international and national NGOs, community- and faith-based organizations (CBO and FBO). They can be divided into two groups, the first are those which provide curative and preventive health services through hospitals and health facilities including emergency situations or difficult to reach populations.

Their role is to

- Ensure quality of services according to national treatment guidelines
- Carry out community outreaches within their catchment populations delivering malaria preventive services as part of an integrated package

The second group are those which work directly with communities in the implementation of a wide range of development programmes or support social mobilization and advocacy at various levels of society.

Their role is to

- Integrate technically sound malaria interventions into their activities covering preventive as well as curative aspects
- Assist in mobilization of resources
- Contribute to policy formulation
- Actively participate in coordinated M&E efforts
- Support national and district levels in the coordination of partners and activities within existing plans
- Apply and evaluate innovative approaches to deliver core interventions

5.2.3. Private sector

As for the civil society the private sector can be divided into several groups the first comprising of the for-profit health care providers: hospitals, clinics, pharmacies, drug shops, and traditional practitioners and includes also their professional organizations (e.g. Private Midwife Association).

Their role is to

- Ensure quality of services according to national treatment guidelines
- Promote behavioural change in treatment seeking and prevention

The second group are the commercial manufacturers and distributors of health related products such as ITN/LLIN, insecticides, medicines, diagnostics, and spray equipment. It includes also providers of services such as transport, IRS or maintenance of spray equipment.

Their role is to

- Provide quality products and services that are adequate for the demands
- Support the development of new or improved products
- Actively participate in the coordination and planning of the national malaria control efforts

Finally there are the large companies and corporations in the banking, industrial, agricultural or service industries.

Their role is to

- Provide leadership in the fight against malaria
- Apply innovative ways to provide their staff with means of protection against malaria and advocate for behavioural change

5.2.4. Communities

In addition to the families their organizations (e.g. women groups), leaders (political and religious), and health structures (Village Health Teams and Health Facility Management Committees) are a crucial partner in the implementation of the malaria strategic plan.

Their roles are to

- Promote and/or provide prompt and adequate treatment particularly for high risk groups and immediate referral in case of non-response or danger signs
- Prioritize preventive measures to protect family as well as community with special emphasis towards the risk groups
- Identify ways how the community can directly or indirectly contribute to the reduction of malaria transmission through community actions

5.2.5. Development Partners

Multi-lateral UN-organizations such as WHO, UNICEF etc. and international finance institutions (e.g. World Bank, ADB, GFATM) together with organizations of bi-lateral cooperation (e.g. USAID, DFID, DCI) form the group of development partners.

Their roles are to

- Support government in providing a sound leadership
- Provide technical support and guidance, particularly at national level

- Support the provision of necessary resources for services and commodities through various channels (SWAp, projects etc)
- Contribute to M&E efforts, particularly nationally representative surveys

5.2.6. Academia

The rapidly growing community of national researchers from Makerere and other universities, institutions such as the Uganda Virus Research Institute or the National Drug Authority but also local and international NGOs form the core of this group. They are supported by international and regional science organizations such as AMREF, EANMAT, the Medical Research Council (MRC), Malaria Consortium, Centres of Disease Control and National Institute of Health as well as a number of other universities and public health schools.

Their roles are to

- Play a key role in the coordination and implementation of M&E
- Carry out essential research that will improve on existing interventions and support their delivery mechanisms
- Maintain a constant dialogue with RBM partners to ensure that results are communicated adequately and that the research agenda is reflecting the implementation needs.

6. Estimated cost for implementation of strategies

Strategy 1: Vector control

1.1: Long-lasting insecticide-treated nets (universal coverage)

Estimated cost of LLINs interventions (US $)	2011	2012	2013	2014	2015
LLINs Cost	14,345,591	29,904,800	32,700,400	117,838,600	25,038,600
Handling and testing	1,463,250	3,202,804	3,568,922	13,221,491	2,860,410
Planning	791,329	1,820,776	2,028,911	7,516,341	1,626,126
Distribution	509,115	1,114,365	1,241,750	4,600,208	995,234
IEC	258,306	482,885	538,084	1,993,395	431,262
HSS	50,533	121,363	135,237	501,000	108,389
Operational research	306,084	132,980	148,181	548,953	118,764
Insecticide monitoring	0	11,656	12,988	48,115	10,410
M&E	0	192,966	215,024	796,582	172,337
TOTAL	**17,724,209**	**36,984,594**	**40,589,496**	**147,064,686**	**31,361,531**

Assumptions

1. Source of quantities: GF Round 7 (reprogrammed) and GF Round 9 proposals
2. For year 2011, activities carry over from the planned substantial LLIN distribution (universal coverage) that starts in 2010
3. Price increases over the years: 5% in 2012, 7% in 2013, 10% in 2014 and 12% in 2015.

1.2: Indoor residual spraying in targeted districts

US $	2011	2012	2013	2014	2015
IRS implementation (24 districts)	38,831,382	42,241,708	36,747,177	37,448,109	38,748,666
Environmental monitoring	582,471	633,626	551,208	561,722	581,230
planning and admin	1,553,255	1,689,668	1,469,887	1,497,924	1,549,947
HSS and Capacity building (MOH and NMCP)	1,941,569	2,112,085	1,837,359	1,872,405	1,937,433
M&E	2,329,883	2,534,503	2,204,831	2,246,887	2,324,920
Supervision and Quality assurance	970,785	1,056,043	918,679	936,203	968,717
Monitoring insecticide resistance	1,087,279	1,182,768	1,028,921	1,048,547	1,084,963
TOTAL	**47,296,623**	**51,450,401**	**44,758,062**	**45,611,797**	**47,195,876**

Assumptions

1. Estimate of# of households: UBOS data
2. As par GF Round 9 proposal information, costing done for 24 districts.
3. IRS using ICON, hence the need to do 2 rounds of spraying per district per year.

4. Cost of initial spraying round is 14,000 shillings per structure sprayed; and cost of sub-sequent spraying wound is 10,800 per structure sprayed.
5. Exchange rate used: US $ 1 = 2,000 UGX
6. Reduction in number of structures to be sprayed starting 2013 (with a focus on targeted spraying).

Strategy 2: Effective Diagnosis and Treatment

2.1: Improved diagnosis using RDTs

US $	2011	2012	2013	2014	2015
RDT Cost	3,197,671	6,374,505	9,116,154	12,025,168	12,523,475
Procurement fees	111,918	223,108	319,065	420,881	438,322
Storage and handling	63,953	127,490	182,323	240,503	250,470
Distribution	159,884	318,725	455,808	601,258	626,174
Training	73,546	146,614	209,672	276,579	288,040
HSS (NMS, HMIS, etc)	63,953	127,490	182,323	240,503	250,470
IEC	47,965	95,618	136,742	180,378	187,852
Supervision	15,988	31,873	45,581	60,126	62,617
Quality assurance	47,965	95,618	136,742	180,378	187,852
M&E	255,814	509,960	729,292	962,013	1,001,878
TOTAL	**4,038,658**	**8,051,000**	**11,513,703**	**15,187,787**	**15,817,149**

Assumptions

1. Source of annual RDT cost estimates: GF Round 9 proposals
2. Cost of the activities related to RDT deployment was calculated as a % of cost of RDTs, including: procurement fees (3.5%); Storage and handling (2%); Distribution (5%); Training (2.3%); HSS (2%); IEC (1.5%); Supervision (0.5%); quality assurance (1.5%) and M&E (8%).

1.2: Management of uncomplicated malaria with ACTs (including HBMF and Private sector)

US $	2011	2012	2013	2014	2015
Procurement of ACTs (public sector, incl. HBMF)	18,031,721	16,070,548	14,286,386	13,334,848	15,187,127
Agency fees & handling	721,269	642,822	571,455	533,394	607,485
Storage	540,952	482,116	428,592	400,045	455,614
Distribution of ACTs	901,586	803,527	714,319	666,742	759,356
Refresher training of Health workers and training for HBMF	540,952	482,116	428,592	400,045	455,614
HSS (NMS, HMIS, etc)	540,952	482,116	428,592	400,045	455,614
IEC	631,110	562,469	500,024	466,720	531,549
Supervision	270,476	241,058	214,296	200,023	227,807
Quality assurance	180,317	160,705	142,864	133,348	151,871
M&E	1,262,220	1,124,938	1,000,047	933,439	1,063,099
sub-total 1	**23,621,555**	**21,052,418**	**18,715,166**	**17,468,651**	**19,895,136**

US $	2011	2012	2013	2014	2015
ACTs (private sector) - procurement	10,855,528	5,863,583	7,143,193	6,667,424	7,593,564
Procurement & handling	542,776	293,179	357,160	333,371	379,678
Public awareness and education campaigns for ACT treatment	1,761,800	934,800			
Provider training, supervision and ongoing support (CMDs)	1,235,966			666,742	
Provider training, supervision and ongoing support (Public Sector)	1,615,222	222,588	142,864	133,348	151,871
Provider training, supervision and ongoing support (Private Sector)	1,304,465	107,215	71,432	66,674	75,936
Pharmacovigilance, resistance monitoring and quality surveillance	574,100	450,500	357,160	333,371	379,678
National policy and regulatory environment efforts	62,958	62,958			
Reaching poor people and other vulnerable groups (Private Sector Distribution & Schools)	2,414,946	1,323,594	1,607,218	1,500,170	1,708,552
Piloting Case Management of Malaria at the Community Level using Parasite Based Diagnosis (RDTs)	604,535	764,548			
Information Leaflets	4,000				
National drug monitoring system	1,042,511	1,862,081	714,319.3	666,742.4	759,356.4
Operational Research	235,025	135,300	142,864	133,348	151,871
Supervision	325,666	175,907	214,296	200,023	227,807
HSS	542,776	293,179	357,160	333,371	379,678
M&E	868,442	469,087	571,455	533,394	607,485
sub-total 1	**23,990,717**	**12,958,519**	**11,679,121**	**11,567,981**	**12,415,476**
GRAND TOTAL (1 + 2)	**47,612,271**	**34,010,937**	**30,394,286**	**29,036,632**	**32,310,613**

Assumptions

1. Estimates picked from the GF round 4 and GF Round 9 proposals.
2. Estimates for the supportive functions were estimated as a proportion of the sub-total for medical supplies (e.g. 5% for supervision, 7% for M&E, 5% for operational research, and varying percentages for the remaining cost items).

1.3: Management of severe malaria

US $	2011	2012	2013	2014	2015
Quinine tablets	304,443	264,733	230,203	191,836	159,863
Quinine IV	679,653	591,003	513,916	428,263	356,886
Parental Artemether	158,586	137,901	119,914	99,928	83,273
50% Dextrose	292,629	254,460	221,269	184,391	153,659
Other accessories	105,497	91,737	79,771	66,476	55,397
Giving Sets	304,504	264,786	230,248	191,874	159,895
Sub - TOTAL	**1,845,312**	**1,604,619**	**1,395,321**	**1,162,768**	**968,973**
Re-training of HWs	83,039	41,520		34,883	

HSS	369,062	160,462	97,672	58,138	29,069
Planning & Administration	129,172	112,323	97,672	81,394	67,828
IEC	92,266		69,766		48,449
Supervision	92,266	80,231	69,766	58,138	48,449
M&E	147,625	128,370	111,626	93,021	77,518
Sub - TOTAL	**913,430**	**522,905**	**446,503**	**325,575**	**271,312**
GRAND TOTAL	**2,758,742**	**2,127,525**	**1,841,824**	**1,488,343**	**1,240,286**

Assumptions

1. Estimates picked from the GF round 4 proposal (for the first 1 year).
2. For supplies, for the remaining 4 years, estimates made on the basis of annual year-on-year decrease of 15% (first 2 years) and of 20% (subsequent 2 years), assuming that other malaria control interventions are having a positive impact resulting in reduced malaria cases.
3. Estimates for the supportive functions were estimated as a proportion of the sub-total for medical supplies (e.g. 5% for supervision, 8% for M&E, 7% for planning and administration, and varying percentages for IEC, training and HSS).

Strategy 3: Malaria in Pregnancy (IPTp)

US $	2011	2012	2013	2014	2015
Cost of SP	219,800	229,313	249,206	270,824	294,318
HSS (NMS, HMIS, training, etc)	103,000	113,300	124,630	137,093	150,802
IEC	114,700	120,435	126,457	132,780	139,419
Planning and Administration	63,910	73,497	84,521	97,199	111,779
M&E	75,080	77,332	79,652	82,042	84,503
TOTAL	**576,490**	**613,877**	**664,466**	**719,938**	**780,822**

Strategy 4: Malaria Epidemics

No quantification available.

Strategy 5: Cross-cutting strategies

US $	2011	2012	2013	2014	2015
BCC: Community Outreach	5,821,156	2,426,620	530,290	462,956	712,854
BCC: Mass Media	692,998	442,119	33,051	29,915	45,947
Coordination and Partnership Development	3,213,027	241,669	328,679	203,151	194,776
Insecticide Efficacy Monitoring	290,713	211,793	214,858	217,006	219,176
Monitoring Drug Resistance	0	444,400	448,844	453,332	457,866

HSS: Information System	2,050,828	2,133,013	1,795,087	2,847,710	1,563,687
M&E and Research coordination	150,700	155,221	159,878	164,674	169,614
Resource mobilisation & tracking research	120,000		150,000		170,000
TOTAL	**12,339,422**	**6,054,835**	**3,660,687**	**4,378,744**	**3,533,920**

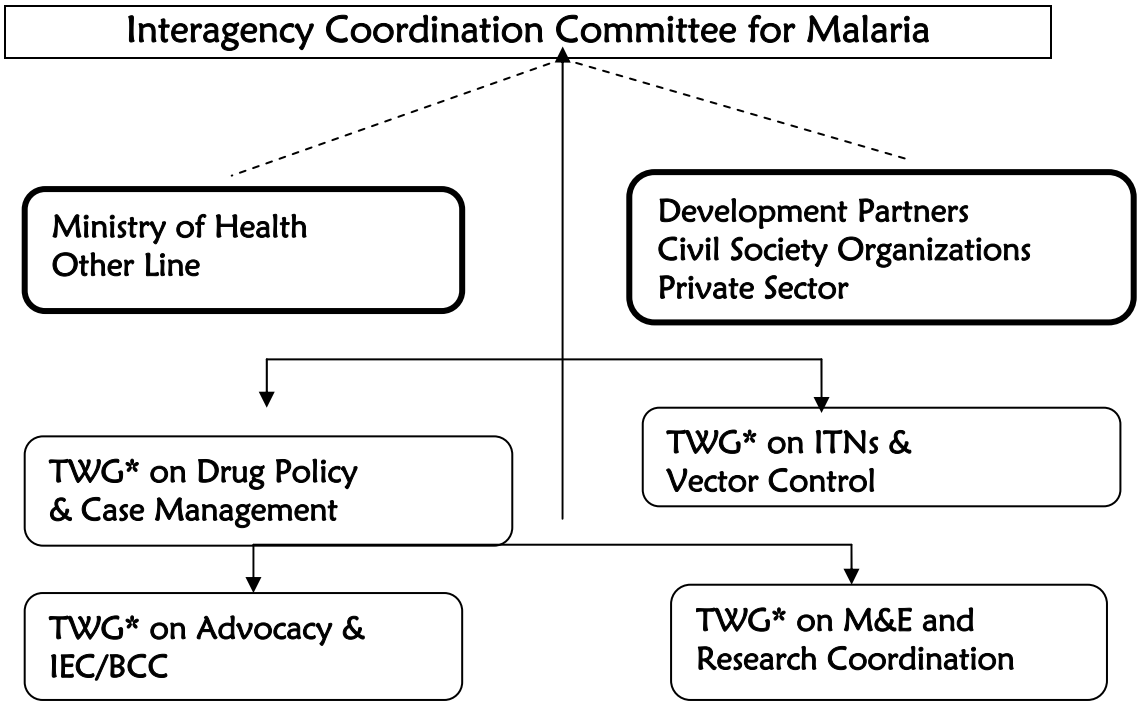
Assumptions

1. Source: Global Fund Round 9 proposal

7. Annexes

8.1. NMCP Structure and Roles

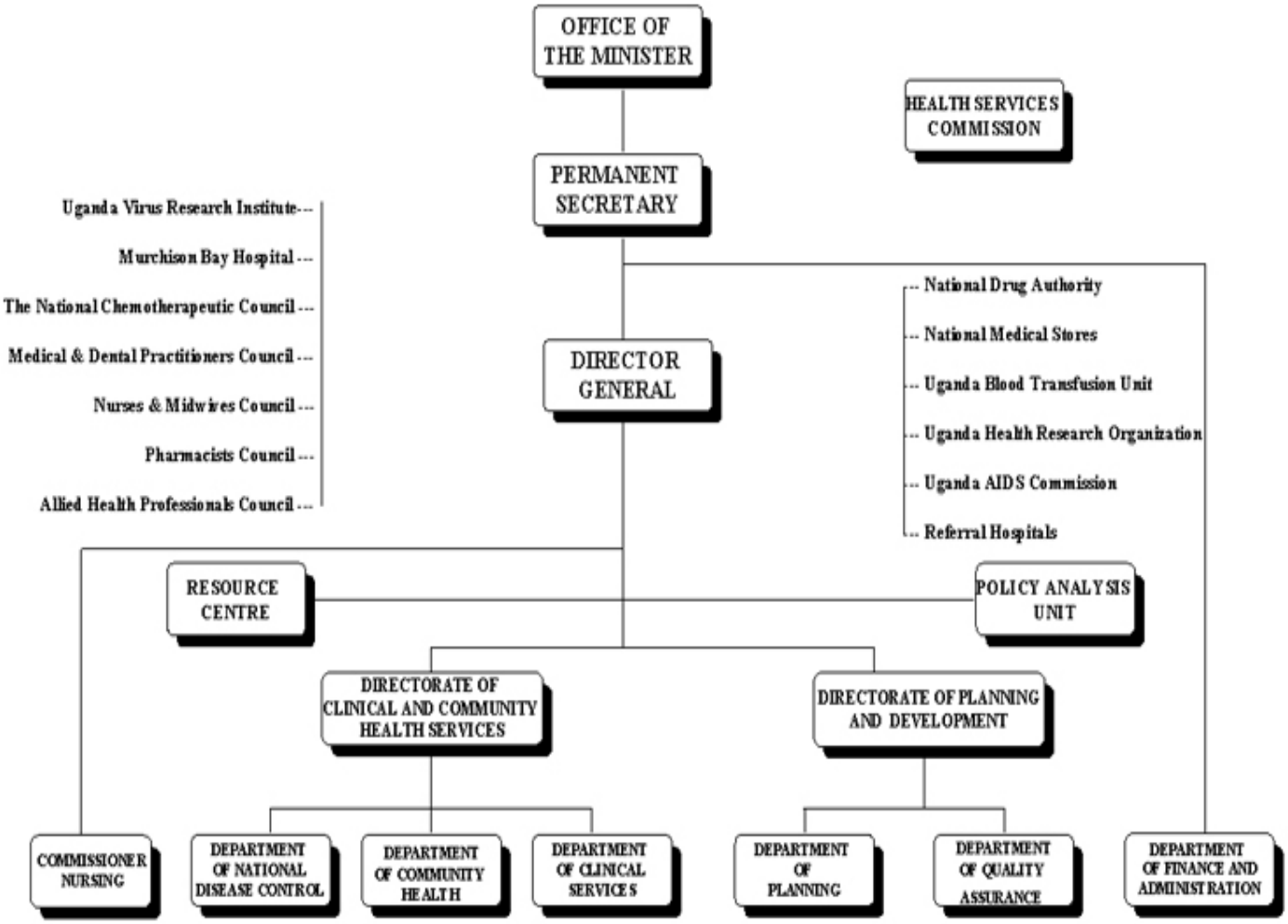
The National Roll Back Malaria Partnership



TWG*-Technical Working Group

8.2. Working Groups

MACRO STRUCTURE OF THE MINISTRY OF HEALTH



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