

Uganda Malaria Control Strategic Plan 2005/06 – 2009/10

Malaria Control Programme Ministry of Health

Foreword

The Malaria Control Strategic Plan is an instrument of the Government's commitment and determination to address the malaria problem in Uganda in a sustainable manner. The plan is a complement to the broader five-year Health Sector Strategic Plan which again is part of the Poverty Eradication Action Plan where malaria features as a high priority health and poverty issue.

Malaria remains one of the most important diseases in Uganda with respect to morbidity and mortality burden as well as economic losses. However, significant progress has been made in the last years that make it very possible that in the next five year period measurable impact can be achieved. The proportion of households with at least one net has doubled between 2000 and 2004 increasing from 13.2% to 25,9% and mechanisms are put in place to allow a rapid increase of net distribution in the future. A successful approach of re-treating mosquito nets through free mass campaigns has been established and plans are ready for a larger scale application of indoor residual spraying. Also, the home based delivery of anti-malaria medicine to children under 5 years has been rolled-out nation wide and the shift to the new, more effective malaria treatment using an Artemisinin-based Combination Therapy (ACT) is in its final stages.

Building on the achievements and challenges of the previous five year period the strategic plan presents an overall objective, sets strategic priorities, describes core intervention strategies and their specific objectives and sets targets. It will serve as a tool to guide planners, administrators and implementers at all levels of health care delivery in Uganda in the process of the implementation of the malaria component of the minimum health care package.

This plan has been based on the principles and aims of the global RBM movement, the Abuja Declaration by African Heads of State and the Millennium Development Goals. It serves as a framework for a broad partnership between the Ministry of Health, the line ministries, civil societies, non-governmental organisations, development partners and the private sector in order to achieve the set objectives and targets.

However, in order to achieve these targets, significant resources will be required to translate the commitment into effective action in order to achieve sustainable malaria control in Uganda.

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Acronyms

ABD African Development Bank

ACT Artemisinin-based Combination Therapy
AMREF Africa Medical Research Foundation

ANC Antenatal Care

BCC Behavioural Change Communication
CBO Community Based Organization
CDC Centres of Disease Control
CMD Community Medicine Distributor

CQ Chloroquine

DCI Development Cooperation of Ireland DDHS District Director Health Services

DFID Department for International Development.

DHT District Health Team

DSS Demographic Surveillance System

EANMAT East African Network for Monitoring Antimalarial Treatment

EPI Extended Programme of Immunisation

FBO Faith-based Organization

GFATM Global Fund to Fight AIDS, Tuberculosis & Malaria

GOU Government of Uganda

HBMF Home Based Management of Fever HIV Human Immunodeficiency Virus

HMIS Health Management Information System

HRD Human Resource Development
HPAC Health Policy Advisory Committee
HSSP Health Sector Strategic Plan

ICCM Interagency Coordination Committee on Malaria

IDP Internally Displaced Persons

IDSR Integrated Disease Surveillance and Response IEC Information, Education and Communication IMCI Integrated Management of Childhood Illness

IMR Infant Mortality Rate

IPT Intermittent Preventive Treatment

IRS Indoor Residual Spraying
ITM Insecticide Treated Material
ITN Insecticide Treated Net
Integrated Vector Management

IVM Integrated Vector Management KAP Knowledge Attitude Practice LLI-K Long Lasting Insecticide - Kit LLIN Long Lasting Insecticidal Net

NMCP National Malaria Control Programme

MCU Malaria Control Unit MOH Ministry of Health

MTEF Medium Term Expenditure Framework

NDA National Drug Authority

NGOs Non Governmental Organizations

NMS National Medical Stores
PLWHA People Living with HIV/AIDS

RBM Roll Back Malaria
RDT Rapid Diagnostic Test
SP Sulphadoxine-Pyrimethamine
SWAp Sector Wide Approach
TWG Technical Working Group

UDHS Uganda Demographic and Health Survey
UNBS Uganda National Bureau of Standards
UNHS Uganda National Household Survey
UNICEF United Nations Children's Fund

USAID United States Agency for International Development

WHO World Health Organization

WHOPES WHO-Pesticide Evaluation Scheme

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Executive Summary

Malaria is highly endemic in most parts of Uganda with 63% of the population of 26.9 million (2005) exposed to high and 25% to moderate malaria transmission levels while 12% live in areas with low or unstable transmission which are epidemic prone. The burden of malaria is still high with estimated 70-100,000 deaths per year among children under 5 years of age and between 10 and 12 million clinical cases treated in the public health system alone. However, in the last years some progress has been made towards effective malaria control. The knowledge of malaria, its seriousness and the major risk groups has steadily increased in the population and now generally reached levels above 80%. Also the demand for preventive measures such as insecticide treated nets has rapidly increased along with the establishment of a viable commercial market for these products as well as distribution mechanisms through civil society and the public sector. This has resulted in an increase of the proportion of households with at least one mosquito net from 13.2% to 25.9% in the last 4 years and many of these nets are now ITNs due to two mass net treatment campaigns carried out in 20 districts in 2004 and 2005. The area of case management has seen important developments with the introduction and nationwide roll-out of a community based malaria treatment programme for children under 5 (HBMF) and the preparations for a shift to a highly effective malaria treatment with Artemisinin-based Combination Therapy (ACT).

Building on these achievements the **overall objectives** for the National Malaria Control Strategy 2005/06-2009/10 are

- to go to national scale with a package of effective and appropriate interventions to promote positive behaviour change and to prevent and treat malaria
- to rapidly achieve and sustain high coverage levels for this intervention package

These core interventions include

- Malaria prevention through ITN with special emphasis on LLIN in highly endemic areas, IRS with focus on low and epidemic prone areas (prevention of malaria epidemics) and environmental management where this is feasible and effective
- Universal access to ACT treatments and improved diagnosis as well as severe malaria management
- Emphasis on treatment and prevention of malaria in pregnancy including IPT
- Intensive advocacy, IEC/BCC efforts and social mobilization at all levels
- Integration of malaria control into a balanced health system development with emphasis on human resource development
- Strong M&E and operational research to monitor progress, evaluate impact and continuously improve interventions

The overall objectives will be achieved by setting priorities and applying the following principles

- Focus on a rapid increase of coverage with preventive measures involving all sectors of society
- Complement prevention efforts by early provision of highly effective anti-malarial combination therapy to affected populations and improve management of severe cases at all levels of health care
- Package these interventions so that all aspects of malaria control are simultaneously and comprehensively addressed (co-coverage)
- Emphasize communication for behavioural impact and community empowerment
- Achieve impact among most vulnerable groups such as young children and pregnant women (highly endemic areas).
- Target particularly the economically disadvantaged (poor) or difficult to reach populations (IDP, nomads etc.), PLWHA with free or highly subsidized interventions

- Continue to build a strong RBM partnership involving all sectors and stakeholders including communities
- Achieve maximum synergy between malaria control and health system development as well as other programmes within the HSSP II
- Apply an evidence based approach to the further development and improvement of malaria control interventions
- Document progress and use successes to secure resources for the future

Implementation through a broad RBM partnership which includes all sectors of society is based on the three ones: **one strategic plan** under which all partners work and contribute to, **one coordination mechanism** to ensure maximum synergy and avoidance of duplications, and **one M&E plan** to measure progress and assess impact. The Ministry of Health through the Malaria Control Programme has the leading role in the coordination of efforts with an improved Interagency Coordination Committee and its Technical Working Groups as the major tool.

To implement the core interventions the following resources will be needed in the next 5 years: 14-16 million ITN/LLIN, 7 million net re-treatments, 2.2 million units for IRS, 111 million ACT treatments and 34 million RDTs. The average cost per year excluding running cost of health services is between 48 and 60 million US\$, but to date not all of this is covered and additional resources are needed.

1. Background and Situation Analysis

1.1. **Country Profile**

1.1.1. Environment

Uganda is a rather small country covering a total of 235,036 km² of which approximately 50,000 km² are taken up by open water and swamps. From Lake Victoria in the South at an altitude of 1,200 meters the land gradually slopes downward to the Northwest reaching about 600 m altitude where the White Nile leaves the country towards Sudan. Most of the Southwest lies between altitudes of 1,300 and 1,500 m while high mountain ranges above 2,000 meters are found in the border region with Rwanda and the Democratic Republic of Congo in the Southwest, the Rwenzori Mountains in the West and Mount Elgon in the East.

Given the geographical position between 1° South of the Equator and 4° North, the climate is tropical in most parts 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. Average relative humidity varies between 54% and 88%. There are generally two rainy seasons, one between March and May and the other between September and December producing 1,200 mm to 1,800 mm of rainfall annually with peaks up to 2,000 mm. However, towards the North and Northeast the rainy season becomes more mono-phased (April to October) and often does not exceed 500 mm per year.

1.1.2. Economy

Since the start of a stable political situation in 1986 following more than a decade of economic decline, political confusion and civil war, the economic situation of the country has improved tremendously with an average growth rate of 5-7% and an inflation rate significantly below that, averaging 4.8% in the last decade. According to the UN Common Database (2002) the per capita Gross Domestic Product (GDP) more than doubled between 1985 and 2002 rising from 560 to 1,390 PPP-Dollar¹. The proportion of the population living under the poverty line, i.e. living in households that spend less per person than would be necessary to avail the minimum calorie intake, declined from 52% in 1992/93 to 44% in 1997/98 and 35% in 1999/2000 (Uganda National Household Surveys - UNHS)). Since then the economic development has stagnated somewhat and in the 2002/03 UNHS the proportion below the poverty line was found to have increased slightly to 38% with indications that this increase is particularly due to urban poverty².

Although no country specific, detailed estimates exist, there is no doubt that malaria has had and continues to have a negative impact on the economic growth. Household studies on the average expenditure on malaria treatment (direct cost) in the mid 90's found that it varied between US\$ 4.10 in urban and \$ 1.80 in rural settings.3 These costs are likely to have increased in view of increased parasite resistance to a number of anti-malarial drugs in the recent past. In addition, 7 days of work are lost on average during each malaria episode. Other studies from countries in sub-Sahara Africa similar to Uganda suggest that the proportion of household expenditure spent on malaria may reach up to 34% in the poorer sections of society⁴ and that annual per capita growth in the countries intensely affected by malaria was 1.3% less⁵.

¹ PPP-Dollar: Purchasing Power Parity is a way to express measures such as GDP independent of changes between currencies and over time.

² Poverty Eradication Action Plan 2001-2003, Uganda Ministry of Finance, Planning and Economic Development

³ Uganda Malaria Control Policy 1998

⁴ Africa Malaria Report 2003

⁵ Gallup & Sachs (2001): The Economic burden of malaria. American Journal of Tropical Medicine & Hygiene, 64 (S1,2) pp. 85-96

1.1.3. Demography

The 2002 Uganda Population and Housing Census Report gives the population for that year as 24,442,084. With an average of 124 persons per square kilometre Uganda is relatively densely populated. Within the country the highest concentration of people is found in the Centre and East (200-500 persons/km²), the Southwest (180-320/km²) and Northwest (155/km²) while population density is much lower in the North (22-69/km²).

The great majority lived 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.

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%.

Some progress has been made in the literacy rate (persons 10 years and older) which has increased from 54% in 1991 to 68% in 2002. However, there is still a significant gender imbalance (males 76%, females 61%) particularly in age groups 30 years and older.

The population growth is one of the highest in sub-Sahara Africa with 3.3% per year between 1991 and 2002. Within the country population growth is highest in the North (4.6%) followed by the East (3.5%). Both regions show a significantly increased growth rate compared to the previous census period 1980 to 1991. In contrast the annual growth rates have remained stable in the Central (2.6%) and Western Region (2.8%). If the growth continues at these rates, the projected population for 2005 is 26.9 million and could reach more than 30 million in 2010.

1.1.4. Health system

The formal health system in Uganda is stratified into the following categories: hospitals (district, regional, national), health center IV (Health Sub-district), health center III (Sub-county) and health center II (Parish). In each of the 56⁶ districts the Director District Health Services (DDHS) is responsible for overseeing all facilities in the district, including those operated by not-for-profit organizations (mainly FBOs) and the private sector. Some of these responsibilities are delegated to the Health Sub-Districts which form the lower level of health services management. According to the 2002 health facility survey, 41% of hospitals, 5% of HC IV, 18% of HC III and 24% of HC II are operated by NGOs.

The respective proportions of health facilities operated by the private for profit sector are 4% hospitals, 1.2% HC IV, 1.5% HC III and 18% HC II. In addition, private for profit services for provision of medicines (pharmacies and drug shops) play a significant role in the delivery of health services. Finally, the traditional and complementary medicine practitioners need to be mentioned who are organized in several professional organizations and whose role and importance vary regionally and with respect to the diseases they treat. Although not a physical structure, the health centre I is thought of as any structure at community level which provides health services through volunteers etc and is increasingly organized in "village health teams".

Lack or inadequacy of human resources at health facilities had in the past been a critical factor in the poor quality of health service delivery and has been a focus during the Health Sector Strategic Plan I 2000/01-2004/05. During this period approximately 2,900 health workers have been recruited into the system increasing the proportion of approved posts filled with trained staff from 33% to 68%⁷. According to the Resource Inventory of 2004 a total of 27,500 health workers were employed 9,100 of these in the not-for-profit private sector. In spite of this

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⁶ In the second part of 2005 the number of districts will be increased to 77

⁷ HSSP II Volume I, MoH 2005

progress the human resource situation is not yet satisfactory and further qualified staff particularly in the area of laboratory diagnosis is needed.

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 in the areas of TB, IMCI and malaria (see also section 1.2.3.5)

The procurement and supply management of essential medicines and health supplies for the public sector is handled by the National Medical Stores while that of the not-for-profit private sector is managed by the Joint Medical Stores. In the last years the supply system has been changed from a push to a pull system. Instead of receiving standard drug kits according to the number of patients reported in the previous three months districts (and health sub-districts) now can order based on their actual demand from the essential drugs and commodities list. Delivery to districts is made in two-monthly intervals and the costs are charged against a credit line (Essential Drug Account). Funds available for essential medicines, vaccines and supplies have increased during HSSP I from \$ 0.80 to \$ 1.50 per person per year but still are far short from the \$ 3.50 which are needed to successfully implement the Minimum Health Care Package defined in the HSSP II. In 2000 previously existing cost-sharing at government health facilities has been abolished and all treatment and medicines now are free of charge.

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 I efforts have been made to strengthen data quality and utilization through training and the introduction of data clerks. The completeness and timeliness of reporting has dramatically improved during the last decade. The proportion of health facilities submitting their monthly reports increased from 61% in 1997 to 73% in 2000 and 88% in 2004. Attempts have been made to expand the HMIS system to enable the collection also of community based data such as those from the Home Based Management of Fever Programme but have shown only limited success so far. The HMIS system is complemented by weekly reports for critical infectious diseases such as Cholera and others under the Integrated Surveillance and Response Programme. In addition, two sites for a Demographic Surveillance System are being established to capture more in depth morbidity and mortality data.

Some parastatal regulatory bodies play a key role in the setting of standards and control of quality and safety in the health sector. These are mainly the National Drug Authority (NDA) and the Uganda National Bureau of Standards (UNBS). The NDA's capacity to test all drugs entering the country in the public as well as private sector has significantly improved in recent years and the organization also plays an increasing role in the establishment of a reporting system for adverse drug events.

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.

The sources of financing for the health sector include the central Government budget (including development partner budget support) through conditional as well as unconditional grants to district, local government and parastatal contributions, project support through development partners, private not for profit agencies, private firms and households through insurance and out of pocket contributions. The proportion of health spending within the GoU budget (i.e. excluding project support) increased from 7.6% in financial year 2000/01 to 10.3% in 2004/05 translating into a \$ 8.30 per capita spending by government and donors. This, however, is only a small part of the estimated \$ 28 per capita health expenditure for 2003/04 the rest of which comes from the private sector and patient out of pocket spending⁸. The amount needed to adequately fund the implementation of the Uganda Minimal Health Care Package is estimated at \$ 30-40 per capita and will need an increase on the health budget to at least 15% over the next years.

Key indicators of the health status of the population showed good progress in the early 90'ties but have stagnated between 1995 and 2000. Infant mortality rate decreased from 122/1,000 live births in 1990 to 81 in 1995 but was found to be 88 in 2000 and the most recent estimate from the 2002 census is 83/1,000. During the same time under-5-mortality rate decreased from 180/1,000 to 147 and was estimated 152/1,000 in 2000 (UDHS 2000/01). Maternal mortality showed little change remaining very high between 527/100,000 in 1990 and 505/100,000 in 2000. Coverage with childhood vaccinations also stagnated in the 90'ties (DPT3 41% in 1990 and 48% in 2000) but showed significant increases in recent years (63% in 2001/02 and 83% in 2004/05). Following the nation-wide measles vaccination campaign in October 2003 the number of monthly reported cases (HMIS) dropped from 3,000-6,000 to less than 400 and has remained low since.

⁸ Ministry of Finance, Health Financing Strategy 2002/03 – 2012/13

1.2. Malaria Situation

1.2.1. Epidemiology

Parasite species

All four human plasmodia species occur in Uganda but *Plasmodium falciparum* is by far 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.

Vectors

The most common vectors are *Anopheles gambiae s.l.* and *Anopheles funestus* with *A. gambiae* being the dominant species in most places. Only during the short dry seasons when permanent water bodies often are the most common breeding sites and in higher altitude areas is *A. funestus* found more frequently. Within the *A. gambiae* complex the predominantly anthropophilic *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%. The *A.bwambae* sibling species of the *A. gambiae* complex is only found near the Semliki Hot Springs in Bundibugyo District and other species such as *A. pharaoensis* or *A. moucheti* - although identified occasionally - do not seem to play any significant part in malaria transmission.

Transmission

In most of the country climatic conditions are suitable for transmission of malaria throughout the year (see section 1.1.1). Consequently, approximately 95% of Uganda's territory is exposed to moderate to very high, mostly perennial transmission levels. Only few areas experience low or unstable malaria transmission and are prone to epidemics. This is mainly the Southwest at altitudes above 1,800 meters and the slopes of Mount Elgon in the East and the Rwenzori Mountains in the West. While more localized outbreaks of malaria are registered in these areas more frequently, approximately every 2-3 years, larger scale epidemics are not quite as common, the last one having been experienced in 1998 during the last El Niño Southern Oscillation (ENSO) weather phenomenon in East Africa.

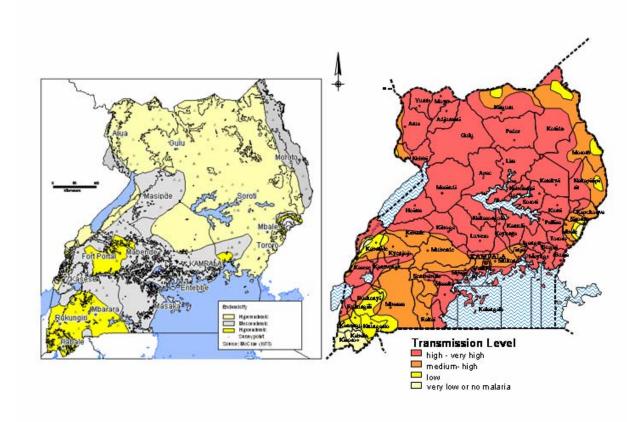
The peak incidence of clinical malaria follows the peak of the rains with a delay of about 4-6 weeks and the most cases are therefore seen December to February and May to July except for the North where the malaria season is more between May and November. Contributing 30%-50% of outpatient burden and around 35% of hospital admissions, malaria is the most common single diagnosis. Exposure to malaria transmission measured during entomological surveys has been found to be as high as 1,500 infective bites per person per year⁹ but is more in the range of 100-400 in the highly endemic areas (hyperendemic) and around 5-50 infective bites in the areas of moderate transmission (meso- and hyperendemic). In contrast to the seasonal variation of malaria incidence asymptomatic parasite prevalence rates in children vary very little throughout the year.

During the past 20-40 years some changes in the ecology have occurred that may have had an influence on malaria transmission. These are mainly factors associated with population growth and increased economic activities such as cultivation of wetlands which create new breeding sites, increase of brick making with open pits which are highly effective breeding places for *A. gambiae*, road construction and agricultural activities (e.g. wet rice growing). However, based on the available evidence from modelling¹⁰, data on the relationship between altitude and malaria parasite rates in children and malariometric data from various surveys and studies – although somewhat limited – there is no evidence that the principal distribution of malaria endemic zones in the country has changed substantially in the last 50 years (Figure 1).

¹⁰ Malaria Risk Mapping in Africa, MARA (www.mara.org.za)

⁹ Apac District 2004, Talisuna et al.

Figure 1: Comparison of one of the hisroric malaria endemicity maps¹¹ with the most recent one based on available data.



Populations at risk

Due to the fact that the population is not evenly distributed in the country (see section 1.1.3) but rather concentrated in the low endemic areas in the Southwest, 87.9% of the population (23 million in 2005) are exposed to moderate to very high malaria transmission, 62.5% or 16.8 million in hyper- and holo-endemicity and 25.4% or 6.8 million in mesoendemicity, while 12,1% or 3.3 million live in the areas of hypoendemicity and unstable or no malaria.

Given this epidemiological situation children under the age of 5 years and pregnant women, particularly during their first two pregnancies, have to be considered the most biologically vulnerable and particularly children contribute the largest part of malaria related mortality (25%-30% of under 5 deaths in highly endemic areas and 70,000-100,000 annually country-wide). Up to 22% of low birth weight in newborns is attributable to malaria (high endemicity) while abortions are the most important negative outcome in low endemicity areas. In 2005 there were about 5 million under fives and 6 million women of reproductive age (15-49 years) in the country with an estimated 1.3 million pregnancies per year. There can be no doubt that poor households are more exposed to malaria with poor quality housing prone to mosquito entry and less means for preventive or curative actions. This population group (38% of households under poverty line or 10.2 million people) also has to be considered as vulnerable. In addition there are approximately 1.2-1.6 million internally displaced people in the conflict zones in the North and about 1 million people living with HIV/AIDS with increased malaria exposure and burden who also are considered as a high risk group.

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¹¹ McCrae 1975, from: Uganda Atlas of disease distribution, Edt. Hall & Langland, 1975

1.2.2. Brief history of malaria control in Uganda

Until the creation of the Malaria Control Unit (MCU) within the Directorate of National Disease Control in 1995 malaria control received little attention within the Ministry of Health (MoH). Since then a significant growth in size and capacity of the National Malaria Control Programme (NMCP) has been observed. Similarly, until early 90'ties few resources from international partners have been available specifically for malaria control with a steady increase since. Political commitment from government also has increased dramatically since the late 90'ties.

In the past the mainstay of malaria control for many years has been treatment of clinical cases mainly with chloroquine (CQ). Attempts at large scale chemoprophylaxis (e.g. chlorinated salt pilot project in the 60'ties¹²) were limited and not very successful. They never were implemented at national scale. With the rapid recovery of the economy after 1986 access to medicines improved dramatically, not only through government and NGO-based health facilities but also and particularly through the private for-profit sector. In many areas drugs obtained from shops, drug shops, pharmacies or private clinics became the principle source for malaria treatment reaching a proportion of between 60% and up to 83% depending on the trading infrastructure of the area¹³.

Resistance to anti-malarial drugs and particularly chloroquine began to increase in Uganda only in the second part of the 1990'ties, significantly later than in neighbouring countries Kenya and Tanzania possibly due to the limited access to drug supplies and hence reduced drug pressure during the 70'ties and early 80'ties. Between 1997 and 1998 a sentinel surveillance system was established as part of the East African network, EANMAT. At 8 sites representing various epidemiological settings the in-vivo efficacy of currently used anti-malarial drugs as well as potential alternatives were tested according to WHO protocols. This system together with studies from other research groups enabled the Malaria Control Programme to adequately monitor resistance levels in the parasite and prepare for treatment policy changes.

With respect to malaria prevention environmental management was strong in Municipalities and Towns but not in rural areas in the 50'ties and 60'ties with drainage (malaria channels) and reduction of breeding sites for all mosquitoes (tin-collectors). This approach ended in the late 70'ties with the beginning of political destabilization in Uganda. Indoor residual spraying (IRS) was implemented at a larger scale only as part of the WHO pilot programme 1959-1963 in the Southwest (Kigezi)¹⁴ and South (Masaka). While significant reductions in malaria transmission could be achieved¹⁵, IRS was never implemented or scaled up as national programme. The reasons for this are not entirely clear. Lack of resources and the coincidence with the end of WHO malaria eradication campaign certainly played a role. Since then IRS has been used only sporadic during epidemics (e.g. 1998 El Niño) or in small, local initiatives mainly in the Southwest as well as in some institutions (e.g. boarding schools, barracks). With mosquito nets only used traditionally in very few areas of Uganda mainly around Lake Kyoga, the introduction of insecticide treated nets (ITN) started with small trials and projects in the early 90'ties. First district based distribution/sales were carried out through NGO's and bilateral organizations (e.g. AMREF, GTZ) but these did not exceed several thousand nets per year. After intensive discussions ITNs were included as a key preventive strategy for the first time as part of malaria control policy in 1998. In financial year 2000/01 Uganda was one of the first countries to introduce a waiver of taxes and tariffs for ITNs. This helped in the rapid development of a commercial mosquito net and ITN sector which since has shown exponential growth rates.

¹² Hall & Wilks, 1967

¹³ DW Batega: Knowledge, Attitudes and Practices about Malaria Treatment and Prevention in Uganda – a literature review. Feb. 2004, Health Communication Partnership

¹⁴ Zalueta et al (1964) A malaria eradication experiment in the highlands of Kigezi. E. Afr. Med. J. 41: 102-120

¹⁵ Around Lake Bunyoni in Kabale District *Anopheles funestus* was successfully eradicated.

1.2.3. Current status of control efforts

The Malaria Control Strategic Plan 2001/02 – 2004/05 had defined the following key targets to be achieved during the 4 years of its operation:

- To increase the proportion of the population at risk of malaria, who receive appropriate treatment for malaria within 24 hrs of recognition of symptoms, to 60% by end of 2005
- To increase the proportion of pregnant women receiving IPT to 60% by end of 2005.
- To increase the proportion of children aged less than 5 years, regularly sleeping under Insecticide Treated Nets (ITN) to 50% by end of 2005.
- To reduce malaria case fatality rate, at hospital level, to 3% by end of 2005.

Progress towards these targets as well as shortcomings and challenges have been assessed during several reviews, particularly the Uganda Roll Back Malaria Scoping Mission of January 2003 commissioned by DFID and the Embassy of Ireland, the Roll Back Malaria Country Consultative Mission for Uganda of September 2003 ("Reaping" Report) and the assessment of achievements and challenges in malaria control during HSSP I for the Joint Health Sector Review Mission April 2005¹⁶. These, supplemented by additional data where available, form the basis for the following summary of progress for the strategies and interventions defined in the last strategic plan.

The table below summarizes the achievements with respect to the core malaria indicators

Indicator	Target	2000/01	2004/05
Proportion of children under 5 receiving adequate treatment within 24 hours	60%	10%	55%
Proportion of women attending ANC services receiving IPT2	60%	10%	33%
Proportion of sleeping under an ITN children	50%	3.5%	15%
Case fatality rate	3%	4%	3%

1.2.3.1. Prevention (Vector Control)

Insecticide Treated Nets

The major focus of the previous vector control strategy was on insecticide treated nets with the intention to achieve the following:

- Creation of demand for nets and insecticides
- Ensuring availability of affordable quality nets and insecticides in urban and rural retail outlets
- Provision of subsidised ITNs to vulnerable groups
- Promoting correct use of ITNs and maintenance of their effectiveness

To a large extent this has been achieved. With the waiver of taxes and tariffs on nets and insecticides, the establishment of quality standards for these products through UNBS and the

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¹⁶ Presentation by Dr. Rwakimari, MCP-MoH

finalization of the ITN policy and strategy document in 2002 an enabling environment was created. An important element in this process was the active collaboration of all stakeholders in the ITN Working Group of the ICCM. Generic as well as brand specific promotion through the public sector, social marketing organizations and the commercial sector significantly increased the knowledge and acceptability of ITNs as a prevention tool and - although still hampered by limited affordability - has induced an dramatically increasing demand. Encouraged through direct project support and favoured by the absence of large scale public sector free net distribution the commercial sector showed an encouraging growth and an expanding network of outlets in the Central, Eastern and Western Regions. The total number of nets sold and/or distributed through all channels increased from 100,000 in 2000 to 845,000 in 2004 and in the first half of 2005 alone reached 815,000¹⁷. Of these nets between 50% and 70% were either ITNs with an insecticide kit in the package (bundled nets) or long-lasting insecticidal nets (LLIN, ~20% of net sales in 2005) which are particularly promoted in the ITN policy. The majority of nets, approximately 70%, have been channelled through the commercial sector either through sales to NGOs which in turn distribute ITNs for free or sell at subsidized prices to their target groups or through the retail market. Social marketing played a significant role in starting the commercial market development and opening new areas, particularly with the introduction of a subsidized product in the economically disadvantaged North in 2003. The share of social marketing among all nets distributed consequently increased from 25% in 2001 to 33% in 2003 and then gradually declined to 18% and 6% in 2004 and first half of 2005. The initial strategy for the public sector was to provide free nets to high risk groups such as the internally displaced persons (IDP) in the Northern conflict areas and make highly subsidized ITNs available in the rest of the country through a voucher scheme where vouchers would be distributed through the health facilities while the ITNs would be channelled through the commercial sector. These activities were to be funded through a GFATM grant (round 2). However, implementation was delayed first due to the change of implementation strategy from voucher scheme to free mass distribution of ITNs through the public sector and then due to the organizational problems in the GFATM procurement process (hiring of third party procurement agent). While ITNs to the IDP in the North were distributed in increasing numbers through other partners, no large scale ITN distributions were carried out during the period of the strategic plan.

The current challenges in the area of ITNs include the control of imports of low quality, untreated nets by the informal commercial sector and the update of the ITN policy and strategy to reflect recent changes in the approach, i.e. larger scale distribution of free nets than originally anticipated.

The problem of low re-treatment rates of mosquito nets was identified early and tackled on one hand by the promotion of LLIN (social marketing, IDP camps, commercial sector) and on the other hand by starting a free, community based net-treatment mass campaign in the 20 districts with the highest net coverage. Supported by the Malaria Control Programme and various development partners the first round was successfully implemented by the districts in May 2004 and a second round in February 2005. In each round close to 500,000 nets were successfully treated. Preparations were made to expand the campaign to the rest of the country but these could not yet be realized due to lack of funding. Experience also showed that the original plans of carrying out net treatment twice a year was not achievable with the existing human and financial resources and that a campaign once a year is more realistic.

The defined target of 50% of children less than 5 years sleeping under an ITN could not yet be achieved during this period. However, significant progress has been made:

Nationally representative data show an increase of households with any mosquito net from 13.2% (UDHS 2000/01) to 25.9% in 2004/05¹⁸ (rural 10.5% to 20.5%, urban from 35.6% to 60.1%)

¹⁷ Sales and distribution of mosquito nets, ITN and insecticides in 2005, ITN WG

¹⁸ Uganda HIV/AIDS Indicator Survey

- Among the internally displaced person's camps in the North net ownership (mostly LLIN) has increased to 39.9%¹⁹.
- A number of district based surveys suggest that the proportion of children less than 5 years and pregnant women sleeping under an ITN reached 15-17% by the end of 2004, up from 0.3 and 0.5% respectively in 2000/01 (UDHS)²⁰.

Indoor Residual Spraying

Indoor residual spraying (IRS) is highlighted in the 2001/02-2004/05 Strategic Plan as an intervention to halt transmission in epidemic-prone areas. In addition it was proposed to be applied in institutions where the use of ITNs is problematic (e.g. inpatient wards, military barracks, dormitories in boarding schools).

Some spraying equipment and insecticides have been purchased, distributed to districts. IRS was carried out in communities in the epidemic prone areas in the Southwest, in boarding schools and other such institutions as well as in during a smaller epidemic in 2001.

Start of regular, large scale application of IRS in at least 2 of the epidemic prone districts was envisaged for 2004 funded through the GFATM grant but did not happened due to the delays in procurement already mentioned above. Nonetheless, some progress has been made that will facilitate implementation in the next 5-year plan:

- IRS policy and implementation guidelines have been finalized as part of an overall Integrated Vector Management (IMV) approach
- Mapping exercises in the epidemic prone districts have been completed
- Detailed, costed plans for the roll-out of IRS operations have been developed
- Staff in several districts has been trained in spraying techniques
- Studies on the susceptibility of local vectors to various insecticides have been undertaken and data analysis is under way

In addition to the epidemic preparedness approach used in all epidemic prone areas, an extended monitoring and early warning system for malaria epidemics was successfully introduced and operated in two districts in the Southwest, Kabale and Rukungiri²¹.

Environmental Management

Other than a pilot project in two urban areas which showed that reduction of Anopheles breeding sites is possible and feasible in urban settings²², no major activities were undertaken in this direction.

1.2.3.2. Case Management

The 2001/02 – 2004/05 intervention strategy with respect to malaria treatment aimed at:

• Improving treatment-seeking behaviour so that patients or caretakers recognise the signs and symptoms of malaria, know what action to take and where treatment is available.

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¹⁹ Health and mortality survey among the internally displaced persons in Gulu, Kitgum and Pader. WHO et al July 2005

²⁰ for example UPHOLD M&E report from 16 districts

²¹ Highland Malaria Project

²² Environmental Health Project, Activity report 140: Community based Environmental Management Program for Malaria in Kampala and Jinja, Uganda. Final Report

- Improving access to effective diagnosis and treatment; in terms of access to physical facilities, drugs and trained health care providers
- Ensuring an adequate supply of effective drugs and ancillary supplies.
- Strengthening the referral system

Trend in morbidity

Between 2000 and 2004 a significant increase in the malaria cases reported by the HMIS has been observed from 3.5 million in 2000 to 10.7 million in 2004. In contrast, figures had increased only gradually between 1997 and 2000 (2.3 to 3.5 million). However, this change can not be in total attributed to an increase in the actual malaria incidence. A number of other factors contributed such as the rapid population growth, new health facilities and therefore higher geographical access of the population to public health services and significant increases in the completeness of reporting. In addition, the abolition of user charges in government health facilities in 2000 lead to a significant increase in user rates for all diseases pulling patients from the commercial sector back into the public health system. When all these factors are adjusted for and malaria cases recorded in the HMIS are expressed as diagnosis per person per year. the increase is only modest in children under 5 from 0.58 episodes in 2001 to 0.68 in 2004 and minimal in older patients from 0.22 in 2001 to 0.23 in 2004. These increases are consistent with the increases in parasite resistance observed during this period which are expected to affect children significantly more than adults. It also needs to be kept in mind that not all reported malaria diagnoses really are malaria cases, e.g. only 47% of the 1.8 million laboratory tests reported by HMIS in 2004 were positive.

Drug resistance and treatment policy

For the period 1999-2001 chloroquine treatment failures had reached an average of 33% in the country²³ and SP mono-therapy 12% increasing from 5.5% for the period 1995-98. In contrast the combination of CQ+SP had an average failure rate of 7%. Therefore at the end of 2000 a decision was taken to change the 1st line malaria treatment policy to CQ+SP. This was an interim solution due to lack of practical alternatives since data as well as commercial products for artemisinin-based combination therapy (ACT) were still scarce at that time. Treatment guidelines and other training and communication materials were updated, supplies of SP increased and all health staff in the public sector were trained on the new treatment. The actual launch of the policy took place in April 2002 and by 2003 p actically all government health facilities used CQ+SP for malaria treatment. In contrast, pick-up was significantly slower in the private sector where in September 2002 only 15% of all shops had both, CQ and SP available.²⁴

As had been anticipated, resistance to SP as well as CQ+SP continued to rise and reached an average of 16% and 12% respectively during the period 2002-2004. At the same time studies indicated excellent efficacy of 98%-99% for ACTs, namely artesunate+amodiaquine and artemether/lumefantrin

A consensus meeting was convened in 2004 and it was decided to change 1st line treatment policy to artemether/lumefantrin. In order to enable broad access to ACT treatment also in the private for-profit sector, artesunate + amodiaquine has been defined as an alternative 1st line treatment²⁵. Detailed projections of the number of treatments needed in the various sectors have been made and funds for the drugs secured through a GFATM grant (round 4). The existing systems for supply management in the public and NGO sectors have been prepared and training and communication materials have been updated. The launch and roll out of the new policy is now anticipated for early 2006. The major challenge will be to avail ACTs not only through the public sector but also through the many for-profit outlets that serve as a major source for malaria treatment.

²³ children under 5 years, 14 day follow-up, average of all studies undertaken

²⁴ Availability of Anti-malarials in the private Sector in Uganda, Commercial Market Strategies Project, October 2002

²⁵ At the time reduced price artemether/lumefantrine (Coartem) through the WHO agreement with the manufacturer is only available for public and not-for profit facilities

Home based management of fever

In order to complement availability of free malaria treatment through public health facilities and bring it closer to the home, a programme of home-based management of [malaria] fever (HBMF) for children less than 5 years of age was introduced in 10 districts in 2002. The blister packed combination treatment of CQ+SP comes in two age-dependent and colour-coded packages, one for children 6 months to 2 years and another for 2-5 year olds. The treatment is called "HOMAPAK" and produced by local pharmaceutical companies. The drug was initially distributed directly to districts by the NMCP but delivery was later integrated into the existing essential medicines supply system. Households, i.e. caretakers of children with fever, access the treatment through volunteers called Community Medicine Distributors (CMD) of which two are selected and trained per village. These CMDs report to and receive supplies from the nearest health facility which is also responsible for the supervision. Between 2003 and early 2005 this programme has gradually been rolled out to cover all districts in the country including the IDP camps in the North. However, not everywhere is each and every village covered concentrating on the difficult to reach areas with poor health infrastructure.

A number of surveys and evaluations have been carried out to assess the performance and impact of the HBMF programme²⁶. Results indicate that compliance with this treatment is excellent (>95%) and an increase of timely treatment of fever episodes is achieved: ~55-60% within 24 hours and 80% or more within 48 hours of onset of symptoms. A significant reduction of severe anaemia (up to 60%) can be observed, particularly among younger children (less than 2 years). No scientific data is as yet available documenting a decline in mortality rates but district records do indicate a reduction in severe cases and deaths. Where health facilities are available close to home and have the trust of the patients, these continue to be utilized even when HBMF services are available so that on average 40-50% of fever episodes are treated by the CMDs. However, HBMF has been shown to mainly reduce the proportion of cases that seek treatment from drug shops and informal private sources where the quality of services is usually poor and difficult to control.

The major challenges for the implementation of the HBMF programme are

- to sustain the initially excellent motivation of the volunteers through an equitable provision of incentives: lack of remuneration or other sorts of incentives often lead to a high attrition rate (up to 50%). However, the fact that this rate can be kept as low as 2% in areas where some additional support through NGOs or other mechanisms is given shows that this problem can be tackled with reasonable inputs.
- to improve supervision, data flow and utilization and supply management through the supporting health facilities which often is hindered by insufficient operational funds and human resources.
- to avoid the establishment of a vertical programme and ensure integration with other community-based health activities such as IMCI
- to ensure continuity of the programme during the transition to the new treatment policy using ACTs. This is a particular challenge since it involves regulatory issues (e.g. to allow community volunteers to handle this new drug), safety issues (e.g. to establish pharmacovigilance), operational issues (e.g. to examine the appropriateness and feasibility of restricting treatment to parasite positive cases by introducing rapid

²⁶ for example: a) baseline and follow-up survey in 9 districts, MoH/WHO/Basics II 2004; b) Baseline & follow-up survey in IDP camps, Kitgum District, MoH/Malaria Consortium/UPHOLD, 2004, c) survey on adherence to community treatment with HOMAPAK in IDP camps in Kitgum, UNICEF/Malaria Consortium, 2005, d) Assessment of implementation and operation of HBMF at district and community level, MoH/WHO/Basics II, 2004; e) Report on workshop to share district experiences of HBMF, MoH 2003; f) Review of implementation of the HBMF strategy in UPHOLD supported districts, Malaria Consortium, 2005

diagnostic tests at community level), and financial issues (e.g. to finance this extra need for drugs)

Diagnosis

Over the years repeated attempts have been made to improve the availability and quality of laboratory diagnosis of malaria through training and provision of microscopes. However, these efforts have been of limited success and it proved very difficult to ensure that all necessary inputs, sufficiently trained laboratory personnel and equipment and supplies, are available at the same time. While the proportion of health facilities with functional microscopy services has increased over the years still only 8% of all cases reported in the HMIS in 2004 were laboratory confirmed. Particularly regular supervision and quality control of laboratory services in the public as well as in the private sector are still insufficient or absent.

Rapid diagnostic tests (RDT) for *P. falciparum* have been tested in Uganda repeatedly for their accuracy and feasibility of use in peripheral health facilities²⁷ and found to be useful in settings where no laboratory is available and the indication for the test is limited to specific target groups. They have been routinely used for the investigation of suspected malaria outbreaks as well as by some NGOs in the context of clinical services in the IDP camps in the North but not on a larger scale in the public health services.

Severe malaria

Efforts to improve the management of severe malaria at health facility and hospital level started in 1996 with a workshop on severe malaria. In 1998 the WHO training materials were adapted for Uganda and a first round of training workshops carried out in the districts focusing on physicians. During the last Strategic Plan period these activities were continued and intensified:

- a meeting was held in 2003 to discuss the status of severe malaria management at hospital level and define necessary steps for improvement including training needs²⁸.
- 2,150 health workers in 80 hospitals (30 districts) were trained in severe malaria management using an updated training manual.
- Additional support materials such as posters with guidelines for severe case management were produced and widely distributed.
- Availability of oral and injectable quinine was improved through procurements funded by development partners
- Average case fatality rate in hospitals reported in the HMIS reduced from 4.1% in 2000 to 3.0% in 2004.

While the situation clearly has improved severe malaria management remains a challenge since it not only depends on adequate training and availability of anti-malarial drugs but also on a functional referral system, availability of blood transfusions and other ancillary treatments and general infrastructure as well as organisation of hospital services (e.g. triage). These elements are not only dependent on interventions by the Malaria Programme but depend on general health system performance which is only slowly improving.

Malaria and HIV/AIDS

Over the past years sufficient evidence has been produced to show that people living with HIV/AIDS – once they experience a deterioration of their immune capacity – suffer more often from clinical malaria, have higher densities of malaria parasites and respond less well to malaria treatment than individuals without HIV/AIDS. This affects mainly adults and multipara gravid women who had already developed good acquired malaria immunity previous to HIV infection.

a) Kilian et al.: Application of the ParaSight-F dipstick test for malaria diagnosis in a district control program.
 Acta Trop. 1999, 72:281-93; b) Guthmann et al.: Validity, reliability and ease of use in the field of five rapid tests for the diagnosis of Plasmodium falciparum malaria in Uganda. Trans R Soc Trop Med Hyg. 2002, 96:254-7.
 Report of a Meeting to Discuss the Status of Severe Malaria Management at Hospital Level and Training Needs, MoH, May 23rd 2003

Based on the fact that there are approximately 1 million people infected with HIV/AIDS in Uganda there is a significant impact of morbidity and mortality. Consequently malaria control has received special attention within the HIV/AIDS programme mainly in the areas of access to ACTs, LLINs and co-trimoxazole prophylaxis. Similarly, PLWHA are being included as high risk group in all components of the malaria programme.

1.2.3.3. Malaria in Pregnancy

Although the Malaria Strategic Plan 2000/01-2004/05 states as the key strategic intervention the implementation of Intermittent Preventive treatment (IPT) in pregnancy, it was realized very early during implementation that a more comprehensive and integrated package for malaria in pregnancy was needed. This is reflected in the Malaria in Pregnancy Control Strategic Plan published in the second half of 2000 which emphasizes three elements: IPT, case management of clinical cases and prevention with insecticide treated nets. The implementation was to be coordinated principally through the Reproductive Health Programme with support from NMCP (malaria in pregnancy focal person) and other departments and stakeholders. The objectives were ambitious:

- To have 60% of all targeted population access IPT by 2004
- To have at least 80% of pregnant women access quality case management according to national guidelines by 2004
- To have at least 60% of all pregnant women have access to ITNs by 2004

The activities undertaken include

- Distribution of treatment guidelines (IPT and treatment) as well as other materials (Flow charts, posters) to all government and NGO health facilities
- Sensitization of health workers (by end of 2003 35% of health workers in 40 districts were trained²⁹)
- Development of a training course on malaria in pregnancy for midwives and nurses
- Procurement and distribution of additional SP to meet the increased demand
- Integration of the number of IPT1 and IPT2 treatments given into the HMIS form (January 2002)
- Adoption of the performance improvement framework to overcome misconceptions and poor practices by health workers
- Design, piloting and adoption of the new ante natal register which captures information on IPT

National ITP2 coverage reported through HMIS³⁰ increased from 22.0% in 2002 to 26.8% in 2003 and 32.9% in 2004. The recording of IPT1 was very irregular in the first 2 years but was calculated as 51.7% in 2004. However, supervision reports suggest that these figures are underestimating the true coverage rate since it was found common practice that treatments given were recorded on the ANC card but not in the HMIS register.

No data are available with respect to the proportion of pregnant women treated for clinical malaria according to guidelines and the proportion of pregnant women sleeping under an ITN was estimated to be about 15-17% in 2004 (see also 1.2.3.1). In early 2005 increased efforts were undertaken to distribute ITNs to pregnant women through ANC clinics in the IDP camps in northern Uganda.

Challenges to Malaria in Pregnancy:

- The integration of malaria case management in reproductive health
- Low availability of ITNs to pregnant women through ANC or other channels

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²⁹ Roll Back Malaria Scoping Study, February 2003

³⁰ After intensive discussion between malaria programme and planning department MoH and other RBM partners it was agreed that IPT coverage be calculated as number of IPT treatments as a proportion of new ANC attendances.

- Many pregnant women attend ANC late during pregnancy leaving insufficient time for the second IPT dose.
- Low reattendance rates at ANC due to insufficient implementation of the concept of "focused ANC" with at least 4 ANC visits during pregnancy³¹.
- Stockouts of SP for IPT and quinine for management of malaria in pregnancy at ANC
- Delivery outside the health facility leading to difficulty in monitoring the impact of various MIP interventions

While the defined targets for the treatment and prevention of malaria in pregnancy could not be reached, the basis for a scale up of the key interventions has been laid.

1.2.3.4. Advocacy, IEC & Social Mobilization

In the 2001/02 – 2004/05 Malaria Control Strategic Plan advocacy and social mobilization featured as a support/enabling strategy. The approach was expected to design and implement IEC programmes through a mixture of channels to influence attitude to malaria control interventions at all levels. It was further highlighted that although the majority of people are aware about malaria, their knowledge on its treatment and control interventions was still low. Through a systematic approach and an empowered attitude advocacy and social mobilization has gained momentum in the following ways:

- With technical support from DISH³², a communication strategy to support the Home Based Management of Fever and Malaria in Pregnancy programmes was produced and by the end of the five years it had been updated to include other interventions.
- Political awareness was raised within high levels of government for the need to support malaria control interventions. The national launch of the Home Based Management of Fever Strategy (HBMF) presided over by His Excellency the President of Uganda was evidence of the success of this approach
- The same launch activity was replicated in more than half the districts presided over by the Ministers of Health and Members of Parliament from the host district and the Parliament Social Services Committee. Political support to-date is positive and rising.
- The media through newspapers, local FM stations, call back programmes on television have dramatically engaged the public in malaria control related debates.
- Faith based institutions coupled with women groups have continued to relay the message on malaria control at all levels. These activities have been complemented with film show activities at village level.
- The production of a documentary on Homapak, production of educational materials, documentation of real life articles and newsletters are some of the tools that have continued to support the profile of malaria countrywide.

Repeated household surveys from several sources consistently show that more than 90% of the population are aware of malaria and its dangers, particularly for the biologically vulnerable. More than 70% of households know what interventions and measures should be taken with radio and health workers generally being the most important sources of information³³. The number of leaflets, posters, radio messages and educational films, newsletters for the general public and health workers etc. produced and disseminated by various partners and coordinated by the Department of Health Education and Promotion of the MOH increased significantly.

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³¹ A recent study of reproductive health in Western Uganda found only 7% of pregnant women attending ANC more than 3 times during their last pregnancy (GTZ Basic Health Services Project: Fertility Evaluation Report in Kabarole, Kamwenge & Kyenjojo, March 2005)

³² DISH: Delivery of Improved Services for Health. A USAID funded project

³³ D.W. Batega: Knowledge. Attitudes and practices about malaria treatment and prevention in Uganda – A literature review, Health Communication Partnership, February 2004

The most important conclusion from the experiences during the period of the past strategic plan is that IEC/BCC and social mobilization are not merely a supportive strategy for other interventions but have to be seen as a key intervention in itself.

1.2.3.5. Malaria Control Programme and the RBM Partnership

Integration of the Malaria Control Programme within the overall health strategy of the MOH continued during the last 4 years as evidenced by the attention this field received during the regular health sector review missions. The personnel allocated to the NMCP increased through the addition of an Information Officer and a Senior Administrator funded by the RBM partners.

A significant weakness identified in the management of malaria control before 2000/01 was the lack of coordination. In order to address this issue the Strategic Plan introduced the structure of the Interagency Coordination Committee for Malaria (ICCM) and its various Technical Working Groups (TWG, see annex for organogram). The ICCM was successfully established with broad participation from other departments and ministries of government as well as development partners, civil society and the private sector. It did not, however, meet very regularly being mainly demand driven and at times was by-passed during crucial decision making processes because it proved to be too large in order to allow the necessary flexibility. Similarly, the TWGs were of varying effectiveness, some meeting very regularly and playing a crucial role in the roll-out of the control strategy such as the ITN WG, others never really establishing themselves as a regular group (M&E and Research). While these RBM coordination mechanisms proved useful in principle they will need some organizational improvements in the future.

Another management issue identified during various missions (e.g. RBM Scoping Study 2003) has been the lack of communication and coordination within the NMCP and frequent distractions through external requests and demands. Although some progress has been made towards a more efficient organization of the NMCP, the situation will need further improvement.

In order to fulfil the role of the central level to supervise and technically support districts in the provision of health services and implementation of programmes a system of zonal coordinators was introduced in 1998 jointly with the IMCI programme. However, insufficient funds for the operational cost of this system prevented a smooth functioning. With support from various development partners including the GFATM grant (round 2) this system was successfully revitalized during the last two years and these zonal coordinator now play a significant role in support supervision, training and improvements in data collection and quality.

In general, the active participation of all stakeholders and partners in the RBM partnership has increased over the last 4 years being enhanced in part through the processes established for the management of the GFTAM grants. This is particularly true for the civil society and the private (commercial) sector. With support from USAID a NGO secretariat has been formed³⁴ which brings together all major NGOs engaged in malaria and child health activities in an effort to enhance coordination and increase the level of technical skills and quality in implementation. MACIS works closely with the Malaria Control Programme to:

- Provide regular technical updates for NGOs and CBOs;
- Coordinate NGOs to share best practices and initiate plans for scale up
- Serve as an NGO conduit on several national coordination committees/ technical working groups with the aim to strengthen the Public Private Partnership strategy adopted by the government to scale up health activities in the country

The commercial sector, on the other hand, has shown significant commitment for the RBM partnership and played a very active role not only in establishing a strong ITN market but also in the Home Based Management of Fever Strategy.

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³⁴ Malaria and Childhood Illness Secretariat (MACIS)

Furthermore, Uganda has actively contributed to attempts to coordinate malaria control across borders by participating in initiatives such as the East African Network for Monitoring Antimalarial Treatment (EANMAT) and the Eastern Africa RBM Network.

1.2.3.6. M&E and Research

Quality, completeness and timeliness of malaria related data from the HMIS has continuously increased over the last years. While in 2000 the average proportion of health facilities submitting their reports in time to the district was 73% this had increased to 88% in 2004. Similarly, the proportion of district reports available at national level increased during the same period from 89% to 99%. Also the flow and utilization of this information within the MOH and NMCP has improved to a large extend owed to the information officer added to the NMCP team.

The principle handicap in monitoring progress towards effective malaria control and the set targets remains the fact that many of the indicators are either extremely difficult to measure such as malaria specific morbidity and mortality with no good proxy measures available from routine data collection, or they cannot be measured at all through HMIS and rely on locally or nationally representative household surveys such as ITN coverage or prompt treatment of fever episodes. With support from development partners NMCP has managed, however, to develop a very good data base of all available information and survey results including those from the commercial sector partners which has allowed the monitoring of progress in a very reasonable manner.

In the area of malaria related research tremendous progress has been made building on a rapidly growing research community in the country. While between 1986 and 1996 only10 malaria related papers from Uganda were published internationally in peer-reviewed journals this figure increased to 38 between 1997 and 2000 and 72 between 2001 and 2004 of which 26 were in the last year. Many of these research activities have directly contributed to the evaluation of current practices and the formulation of relevant policies such as the treatment policy. Nonetheless, there is need to further improve the coordination between researchers and their agenda and the needs of the NMCP so that research continuously contributes to the evidence base for improved interventions in all areas of malaria control. Recent efforts to establish a "Malaria Research Institute" in the country may be a useful development to assist in the task.

1.2.3.7. Resources

The level of funding for malaria control during the period 2000/01-2004/05 has been the highest in the history of Uganda. According to an overview compiled in 2004 for the round 4 GFATM application the total amount available for the national response to the disease increased from US\$ 55 million in 2001 to US\$ 73 million in 2004. This figure, however, includes also contributions to the health services and the Minimal Health Care Package in general. Of the resources calculated for 2004 slightly more than half (53%) were external funds (development partners). Of the external resources 58% were in the form of budget support, 13% bilateral or multilateral projects and 28% from GFATM grants. Major contributors were ABD, USAID/CDC, DFID, Development Cooperation of Ireland (DCI), WHO, UNICEF while many other donors and international NGOs also supported the implementation of the strategic plan.

Two significant constrains were encountered which negatively influenced availability of resources for the full implementation of the strategic plan

 Delays in the interventions planned through the GFATM round 2 proposal particularly in the field of vector control (IRS and ITNs). These were due in part to changes in implementation strategy (public distribution of ITNs instead of voucher scheme) but also

- due to significant delays in the procurement process (hiring of third party procurement agent) and the temporary suspension of all Ugandan GFATM grants.
- Continuing discussions with the Ministry of Finance, Economic Development and Planning on the issues of the overall sector sealing and which funds are to be included in the calculation of the sector funds.

While the increase of financial and human resources for malaria control in the past 4 years has enabled the Ugandan RBM partnership to make significant progress towards the set targets, they were not sufficient to reach the level of scale necessary. While the principle strategies for malaria control could be shown to be adequate to make further progress in the future, availing the necessary resources to achieve national scale remains a challenge.

2. Five Year Malaria Control Strategy

The approaches and core interventions for malaria control in Uganda are outlined in the following sections. For an overview in tabular form please refer to Logical Framework in the Annex.

2.1. Context within the National Development Framework

Although the burden of malaria significantly contributes to the poor health status of the population the strategies to control it are not seen in isolation but are firmly embedded in the national efforts to enhance development, reduce poverty and improve health. The overall approach is, furthermore, already described as part of the Uganda Minimal Health Care Package outlined in the Health Sector Strategic Plan 2005/06-2009/10 (Cluster 3 – control of communicable diseases).

The purpose of the Malaria Control Strategic Plan 2005/06-2009/10 is to provide a common platform and detailed description of interventions for all RBM partners and sectors of society. It encourages all partners to engage themselves in malaria control with a common strategy and objectives, i.e. one plan, one implementation and coordination mechanism and one M&E plan. It builds on the previous plan making the necessary changes based on the situation analysis.

2.2. Vision

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.

2.3. Goal and Overall Objectives

The **goal** of malaria control in Uganda is

• to control and prevent malaria morbidity and mortality, minimize social effects and economic losses attributable to malaria in the country.

Overall objectives for the period 2005/06 – 2009/10 are

- to go to national scale with a package of effective and appropriate interventions to promote positive behaviour change and to prevent and treat malaria
- to rapidly achieve and sustain high coverage levels for this intervention package

2.4. Strategic Priorities and Principles

The overall objectives will be achieved by setting priorities and applying the following principles

- Focus on a rapid increase of coverage with preventive measures involving all sectors of society
- Complement prevention efforts by early provision of highly effective anti-malarial combination therapy to affected populations and improve management of severe cases at all levels of health care
- Ensure that high quality clinical and parasitological diagnosis is used to guide appropriate treatment with an effective antimalarial
- Package these interventions so that all aspects of malaria control are simultaneously and comprehensively addressed (co-coverage)
- Emphasize communication for behavioural impact and community empowerment

- Achieve impact among most vulnerable groups such as young children and pregnant women (highly endemic areas).
- Target particularly the economically disadvantaged (poor) or difficult to reach populations (IDP, nomads etc.), PLWHA with free or highly subsidized interventions
- Continue to build a strong RBM partnership involving all sectors and stakeholders including communities
- Achieve maximum synergy between malaria control and health system development as well as other programmes within the HSSP II
- Apply an evidence based approach to the further development and improvement of malaria control interventions
- Document progress and use successes to secure resources for the future

2.5. Core Interventions and their Specific Objectives

2.5.1. Prevention (Vector Control)

Objective 1: Rapidly go to national scale with insecticide treated nets in areas of moderate to very high malaria transmission using a mix of distribution mechanisms and to sustain high coverage rate with a continuous "replacement" distribution.

Objective 2: Increase the proportion of LLIN among all mosquito nets to a level that makes further re-treatment campaigns unnecessary.

Objective 3: Establish and sustain a system of at least annual, high quality IRS services that cover at least 85% of all targeted structures*, in areas of unstable transmission** whilst piloting in stable malaria transmission areas and scaling up where feasible.

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.

Reaching all affected populations with measures to prevent plasmodial infection and clinical malaria episodes will be the most important strategy in the coming years with the ultimate, long-term goal of reducing the intensity of malaria transmission.

The three elements of this strategy to reduce man-vector contacts will be

- Use of insecticide treated mosquito nets (ITN) with preference for long-lasting insecticidal nets (LLIN) and an initial focus on the biologically vulnerable (i.e. children under the age of 5, pregnant women, people living with HIV/AIDS) and the economically vulnerable.
- Application of quality indoor residual spraying (IRS) in areas of unstable transmission whilst piloting in stable malaria transmission areas and scaling up where feasible. In addition, IRS will be implemented in institutions and settings where it has been shown to be feasible including internally displaced persons and refugee camps.
- Addition of environmental measures, including larviciding, to complement the above mentioned interventions wherever possible and feasible

^{*} While 80% is stated in HSSP II, the targets quoted throughout this document are in line with the revised Abuja targets of 2006

^{**}Areas of unstable transmission are defined under section 1.2.1

As much as possible these measures of vector control will be integrated with the control of other vector-borne and/or neglected diseases as part of an Integrated Vector Management (IMV) that pro-actively involves all relevant line ministries and departments such as Agriculture, Water and Sanitation, Environment, Works, Education, Trade & Industry. Local communities will also be involved.

Furthermore, the mix and geographical distribution of these interventions will be flexible according to needs or changes over time and will be done in such a way to minimize environmental impact.

Insecticide treated nets

Building on the successes of previous years and the emerging strong net culture in the population, a public/private mix approach will continue to be applied using all available mechanisms for distribution, sale and promotion of ITN in a dynamic and flexible fashion, namely:

- Free ITNs to the vulnerable population
- Subsidized sales mainly through civil society
- Commercial sales through the private sector

Groups considered particularly vulnerable that are to be targeted for free or highly subsidised ITNs are: the biologically vulnerable (pregnant women, children under five) the economically vulnerable (refugees, IDPs and, more broadly, those 10.3 million of the population living on less than \$1) and people with diminished immune status (e.g. people living with HIV/AIDS).

In the implementation two components can be identified that will require a different combination of distribution mechanisms. The first component is the "going to scale" which will rapidly increase the coverage of households and target groups with ITN and apply distribution mechanisms which can reach large populations in a short time. Once high coverage is reached the target is to sustain this level over time implying that nets which are lost or have reached the end of their useful life are replaced. This is the second component and can be termed the "replacement" distribution³⁵

- "going to scale" needs fast distribution and a high proportion of population reached and the main distribution mechanism will be mass campaigns or community distribution through public sector and civil society targeting households with children under 5 and/or the poor.
- "replacement" needs sustainable long term distribution mechanisms and for this purpose
 health facility based distribution targeted to pregnant women (free), subsidized
 distribution through civil society organizations and commercial sector distribution
 networks (targeting those who can afford) will be used.

Specific efforts will be made in the following areas:

- to strengthen the public/private mix approach of ITNs by:
 - o use of mechanisms to reduce the resale value of nets (e.g. removal of packaging prior to distribution, marking of nets as 'free')
 - o introduction of procedures to monitor leakage
 - o emphasising the quality assurance of ITN products by strengthening the enforcement of current standards, in particular to address the issue of large-scale import of sub-standard nets.
- Correct use of ITNs will be emphasised through the various approaches to IEC and, in particular, behavioural change communication (BCC). There will be a focus on site

³⁵ In analogy to vaccination programmes these two phases have also been called "catch-up" and "keep-up"

specific approaches. Monitoring and evaluation of these approaches will be carried out to ensure impact of this component and adaptation or improvement if required.

- Long-lasting insecticidal nets (LLIN) have shown to provide insecticide protection at least
 for the average useful life of the net. As they do not need to be re-treated they are more
 cost-effective than conventionally treated nets and will be the preferred product. Once a
 sufficiently high proportion of nets will be LLIN there will be no further need for net retreatments.
- In the transition period re-treatment of the existing crop of conventionally treated or untreated nets will be done through at least annual campaigns organized through the public sector and with free net treatment covering all areas where ITNs are implemented. As soon as long-lasting insecticide kits have obtained official recommendation through WHO (WHOPES) they will be considered for use during the net treatment campaigns.

Indoor residual spraying

This strategy will concentrate initially on the areas most prone to malaria epidemics serving as an active prevention of epidemics. Mapping of local transmission patterns and potential may allow more focal spraying in these areas should this be politically appropriate and necessitated by resource availability.

IRS will also be used in other defined situations such as in institutions, in peri-urban areas and in IDP or refugee camps in combination with ITNs where this is useful. Over the five year period a scale-up of IRS to all appropriate areas is envisaged. IRS may also be used in highly endemic areas based on the results of pilot studies in these areas.

The major focus for IRS will be to rapidly build implementation capacity in the public sector in the areas selected for this intervention and establish a system of regular, 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 other line ministries as well as civil society and the private sector.

Insecticides for IRS will be chosen after careful evaluation of all aspects including

- resistance patterns of local vector populations
- cost-effectiveness
- environmental impact
- management aspects
- acceptability by the population
- medium-term strategy to prevent or delay development of resistance in the vector populations

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

Environmental control

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. This will be carried out where a significant proportion of breeding sites can be identified and targeted and where measures can be sustained, such as urban areas and development schemes. In the case of temporary breeding sites consideration will be given to the optimal timing in relation to the rains. Collaboration and support will be sought from other line ministries, urban councils and the communities.

Monitoring of Quality of Insecticides, Larvicides and Mosquito Nets

The Malaria Control Programme together with its partners in the research community will continue to monitor the sensitivity to insecticides in current use and test potential future insecticides which might provide better or more cost-effective options. Any changes in the resistance or safety patterns as well as possible new insecticides will be incorporated into a revised vector control policy if this is thought necessary after careful consideration and consensus building by all relevant stakeholders.

Insecticide application techniques including the knowledge and skills of vector control personnel will be improved. The quality of public health insecticides and mosquito nets will be regularly monitored by the NDA and UNBS in collaboration with relevant regulatory and enforcement agencies. The selection of LLINs for public sector procurement will be guided by international standards such as WHOPES recommendation. 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.

2.5.2. Case Management

Objective 5: Ensure access by all to Artemisinin-based combination therapy (ACT) including those accessing treatment through the commercial sector

Objective 6: Enhance the prompt treatment of children under 5 within 24 hours of fever onset through the provision of home-based management of malaria fever using ACT

Objective 7: Reduce case fatality of severe malaria by establishing a system to provide highly effective pre-referral treatment (e.g. rectal Artesunate) and improve the management capacity for severe malaria at health facilities and hospitals

Objective 8: Increase the proportion of malaria cases confirmed by high quality clinical and parasitological diagnosis guided by feasibility and cost-effectiveness

Providi ng prompt and highly effecti ve antimalari al combi nation therap

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

- 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

Treatment with ACTs will be free in the public sector including the HBMF programme. While the ACT will be given free to the not-for-profit private sectors there may be a charge levied to the patient for other parts of the treatment package. Efforts will be made to encourage the private for profit sector to provide ACTs at the lowest possible price, as well as improving the quality of care within this sector.

Drug efficacy and quality monitoring

The Malaria Control Programme together with its partners in the research community will continue to monitor drug sensitivity of anti-malarial drugs in current use³⁶ and test potential future treatments 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.

Treatment practices as well as knowledge and skills of health care providers will be improved. Campaigns will be undertaken to increase correct treatment seeking behaviour among the population.

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.

Severe malaria management

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

- Introduction of suitable and easily applicable pre-referral treatment (e.g. rectal Artesunate) at peripheral health facilities (HC II) as well as at community levels where this can be shown to be feasible and effective.
- Improving availability of safe blood and blood products for transfusing severely anaemic patients as well as other relevant IV fluids and ancillary treatments
- Improvement of the management of severe disease at higher level health facilities (HC II & IV) and hospitals which not only involves availability of medicines and commodities but also skills and processes including patient triage.

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

Malaria Diagnostics

With the introduction of ACTs the need is increasing to minimise unnecessary treatment while at the same time providing maximum coverage with treatment access. Coverage of high quality clinical and parasitological malaria diagnosis will be increased. Parasitological diagnosis will be either through microscopy or rapid diagnostic tests (RDT). Decisions on the choice of diagnostic method will be guided by feasibility and cost effectiveness in the health service and epidemiological setting. This will be done based on piloting and operational research and as part of the overall strengthening of diagnostic services within the health system.

2.5.3. Malaria in Pregnancy

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³⁶ including SP used for IPT

Objective 9: Increase coverage with at least two doses of 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 10: Emphasize the prevention of malaria with ITNs among pregnant women by including distribution mechanisms suitable for this target group and promote the regular and correct use of the nets.

The impact of malaria on a pregnant woman and her foetus differs with the intensity of malaria transmission but in any case represents a significant burden on the health of mother and child. 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 with the three elements of

- Intermittent preventive treatment (IPT)
- Prevention with ITNs
- Prompt treatment of clinical malaria episodes with drugs or drug combinations adequate for the stage of pregnancy.

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. 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 ITN/LLIN particularly through ANC services. 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 ITN 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.

2.5.4. Malaria Epidemics

Objective 11: 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

As des crib ed

under the vector control section active prevention using IRS will be introduced in the epidemic prone areas as the primary strategy.

In epidemic prone areas where IRS is not yet established the existing programme for epidemic preparedness and response focusing on strengthened forecasting, early detection, confirmation and 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, drugs, insecticides, equipment). Districts will be supported with the required resources and capacity to respond immediately

2.5.5. Advocacy, IEC & Social Mobilization

Objective 12: 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 13: Support active community participation in malaria control activities

Mobilizing the communities, local, regional and national as well as political and religious leaders to play an active role in malaria control and ensuring proper understanding of the core interventions by the population and promoting positive change of behaviours is the major purpose of advocacy, IEC & social mobilization as part of the malaria control strategy. Although it is a crucial element of all the interventions described above 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.

The existing communication strategy for all aspects of malaria control 2005 - 2010³⁷ will form the basis of activities in the next 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
- Improve the quality of health care (e.g., counselling and client information)
- Create demand for malaria services and products
- Improve client compliance with treatment
- Change household practices (e.g. ITN use, and early treatment of fevers in children)
- Involve communities in malaria control

Uniting all partners and stakeholders from the public and private sectors behind a common, 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 utilizing 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.

2.5.6. Health System

Objective 14: Strengthen the leadership role of the NMCP to promote partnership and coordination for malaria control at all levels of the health system

Objective 15: Contribute to the strengthening of a decentralised health system that can deliver quality services and effectively manage supplies through the NMCP and malaria zonal coordinators.

Objective 16: Strengthen capacity of district malaria focal persons to promote and coordinate malaria control activities at district, health sub-district, subcounty and community levels.

Objective 17: Strengthen capacity of regulatory bodies such as National Drug Authority and the National Bureau of Standards to monitor the quality of malaria medicines, ITN and insecticides used for malaria control.

Malaria control is an important part of the National Minimal Health Care Package within the HSSP II and will only be successful if closely linked to progress in health system development in general. Health system support needs, therefore, are to be seen as a core intervention within the malaria control strategy. 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 malaria focal persons through the zonal coordinators and the central level. This will include collaboration with other programmes such as Child Health, Environmental Health, Reproductive Health, Community Development as well as logistical support for day to day operations. It will enable them to undertake support supervision at health sub-district, subcounty, 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 subcounties 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).

2.5.7. Monitoring & Evaluation and Research

Objective 18: Improve collection, quality and utilization of routine data to monitor the implementation of malaria related interventions through the Health Management Information System and other sources including Malaria Indicator Surveys, Demographic Surveillance System (DSS), sentinel sites and the private sector.

Objective 19: Strengthen links between the research community and RBM partners in order to ensure that ongoing research is oriented towards the key operational questions and can provide the necessary evidence to continuously improve interventions for malaria control.

The trend of the recen t years of const ant impro veme

nts of the quality and timeliness of routine data collection in the HMIS will be continued with a special emphasis on the data from Community Medicine Distributors within the Home Based Management of Fever Programme. For those areas where no meaningful data is available from HMIS such as household coverage and use of mosquito nets, other approaches and data sources will be used to obtain a good and continuous update of progress of implementation. This will include nationally representative household surveys like the Demographic and Health Surveys (DHS) which is already planned for 2006 and a Malaria Indicator Survey to be carried

out in 2009 for which funding will be secured from development partners. In order to enhance its ability to monitor progress the NMCP will also utilize results from non-national, smaller scale surveys between the nationally representative data collections as well as data from the private sector.

The NMCP will work with all RBM partners through the M&E and Research TWG of the ICCM to ensure that indicators and assessment tools are standardized as much as possible. To this end a comprehensive M&E plan will be developed that includes impact, outcome, output and process indicators and will use already existing indicators from RBM, GFATM etc.

Currently two sites for a Demographic Surveillance System (DSS) are being established in Uganda which will provide reliable and annual data on trends in all cause mortality. The NMCP will support these DSS sites and the utilization of the data it produces to its maximum potential and strive to expand the DSS system to other areas so that a comprehensive demographic picture can be obtained and - to the extent methodologically possible - malaria specific mortality trends established. In addition, current antimalarial drug monitoring sentinel sites around the country will be expanded in their function to include monitoring of key malaria control indicators.

Ongoing efforts to establish a National Malaria Research Centre will be continued. Representatives from this institution will be key members of the ICCM TWG on M&E and research and support the NMCP to update the list of operational and basic research issues that need to be addressed in order to monitor and improve interventions for malaria control. The NMCP will closely work with the research community as well as other RBM partners to achieve this objective. 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

2.6. Targets

The following are the major targets for malaria to be achieved by the end of the five year period. These targets will directly contribute towards the overall targets of mortality reduction as defined in the HSSP II and PEAP:

Overall targets to which malaria control will contribute:

- Infant Mortality Rate reduced from 88 to 68 per 1,000 live births
- Under-5 Child Mortality Rate reduced from 152 to 103 per 1,000 live births
- Maternal Mortality Rate reduced from 505 to 354 per 100,000 live births

Specific malaria control targets to be achieved by mid 2010:

- 1. Proportion of households having at least one insecticide-treated net (ITN) increased from 15% to 85% and households with at least two ITNs from 10% to 60%
- 2. Proportion of children under 5 and pregnant women having slept under an ITN the previous night increased to 85%

- 3. Number of districts covered by IRS (i.e. regular, high quality spraying of at least 85% of structures) increased from 0 to 15
- 4. Proportion of children under five receiving correct treatment according to national treatment guidelines within 24 hours of onset of symptoms increased from 55% to 85%.
- 5. Proportion of pregnant women attending ANC services who have received IPT2 increased from 33% to 85%.
- 6. Case fatality rate among malaria in-patients under five years of age reduced from 3% to 2%.

2.7. Milestones

Important steps on the way to reaching the specific targets are the following milestones that will be used to monitor whether implementation of core interventions is on track:

Target area	2005/6	2006/7	2007/8	2008/9	2009/10
Prevention					
ITN	At least 3.5 mil. ITNs distributed or sold in public & commercial sector, LLINs at least 40%	At least 3.5 mil. ITNs distributed or sold in public & commercial sector, LLINs at least 60%	At least 2.5 mil. ITNs distributed or sold in public & commercial sector, LLINs at least 70%	At least 2.5 mil. ITNs distributed or sold in public & commercial sector, LLINs at least 80%	At least 2.5 mil. ITNs distributed or sold in public & commercial sector, LLINs at least 90%
Net re-treatment	Free mass campaign extending to at least 50 districts with 1.2 million treatments	Free mass campaign nation wide covering 2.7 million nets	Free national campaign 2.0 mil treatments	Final mopping up campaign in areas with high proportion of non-LLIN, 0.4 mil treatments	
IRS	IRS services established in 3 district	IRS services expanded to at least 12 districts	IRS services expanded to at least 20 districts	IRS services sustained in at least 30 districts	IRS services sustained in at least 40 districts
Environmental Management and Larviciding		Mapping out of suitable sites, baseline data collection and planning of pilot	Initiation of operational study on environmental management/ larviciding	Finalisation and dissemination of study results and preparation of action plan	Implement appropriate environmental control strategies
Case Management			_		
Uncomplicated malaria	ACTs rolled out to all health facilities by July, ACT use in HBMF piloted	ACT implementation within HBMF begins	ACT HBMF covers all districts. Less than 40% of private sector outlets still have CQ or SP monotherapy	ACTs available in at least 80% of private sector outlets	Consolidate and sustain achievements
Severe malaria	At least 50 % of hospitals and HC IV with all necessary equipment and commodities	At least 70% of peripheral health facilities have adequate pre-referral treatment	At least 80% of hospitals and HC IV with all necessary equipment and commodities	Expansion of pre-referral treatment to community level (HBMF) where feasible	Consolidate and sustain achievements
Malaria in Pregnancy					
IPT	At least 40% of ANC attendees receive IPT2	At least 50% of ANC attendees receive IPT2	At least 60% of ANC attendees receive IPT2	At least 85% of ANC attendees receive IPT2	Consolidate and sustain achievements

2.8. Key Assumptions

The following assumptions are important points that need to happen in order to achieve progress in malaria control as outlined under the specific objectives but that are beyond the direct control of the Malaria Control Programme and RBM partnership. However, the partnership will do its part to enhance the likelihood that these assumptions are met.

- Continued political commitment by leadership at all levels to support the national strategic plan for malaria control
- Agreement with Ministry of Finance, Planning and Economic Development that allows additional funding for malaria control to be used without negatively affecting other departments or programmes
- Further improvement of performance of health services (availability of infrastructure, supplies, staff etc)
- Continued financial and technical support from development partners during the period of the plan and beyond
- Continued availability of needed products on the international market at the needed quantities

3. Implementation

3.1. Implementation mechanisms

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**).

3.1.1. 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.

3.2. Partners and their key roles

This section describes each of the partners in the national efforts towards malaria control and their key roles.

3.2.1. 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. 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).

3.2.2. 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

3.2.3. 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

3.2.4. 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

3.2.5. 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

3.2.6. 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, Centers 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.

3.3. Resources

3.3.1. Inputs needed

In recent years the Malaria Control Programme with technical support from development partners has increased its ability to make projections of inputs needed to achieve the set targets and make significant impact on the disease burden caused by malaria. Although these are only estimates based on assumptions that need to be verified and possibly corrected in the future, they give in impression of the order of magnitude needed to achieve the set targets.

ITN and net re-treatment

Based on 2005 estimates for net coverage, average nets per net owning household, average annual net loss rate³⁸ and proportion of nets being ITNs or LLINs it has been estimated that – independent of which distribution mechanisms are used – **a total of 15 million ITN/LLIN** will have to be distributed in the country over the time period of this strategic plan in order achieve and sustain the set targets of 80% household coverage with ITN and 80% of children under 5 sleeping under an ITN³⁹. Ideally the distribution would be concentrated in the first years as a "going to scale" phase and later concentrate on sustaining success through "replacement' distributions. One possible scenario consistent with the proposed strategy for ITN is presented in Figure 2, although another timing or mix of distribution mechanisms would also be possible depending on availability of resources.

Under the condition that the proportion of LLIN among all distributed nets will steadily increase and that a long-lasting insecticide treatment kit (LLI-K) for field use will receive WHOPES recommendation it will be possible under the proposed strategy to reach >90% of all mosquito nets being LLIN by 2010 and sustain this level without further net re-treatment campaigns. Based on the inputs used in Figure 2 a total of **4.3 million conventional treatments and 2.4 million LLI-Ks** would be needed over the period of the strategic plan for this scenario (see Figure 3). If the proportion of LLIN is significantly lower (~60%) and LLI-K not available, the number of net treatments needed over the period of the plan will be approximately 13 million.

³⁸ This loss rate refers to the proportion of nets that need to be replaced and has been calculated to be 18.5% based on net crop estimates for 2001 and 2004 from nationally representative surveys and the input of nets from all sources during this time period.

³⁹ Areas where IRS is envisaged have been excluded from calculations.

Figure 2: Scenario of distribution of ITN/LLIN and the estimated resulting household net coverage and proportion of under fives sleeping under an ITN

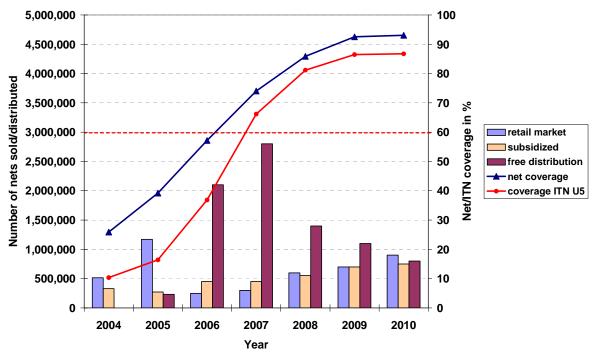
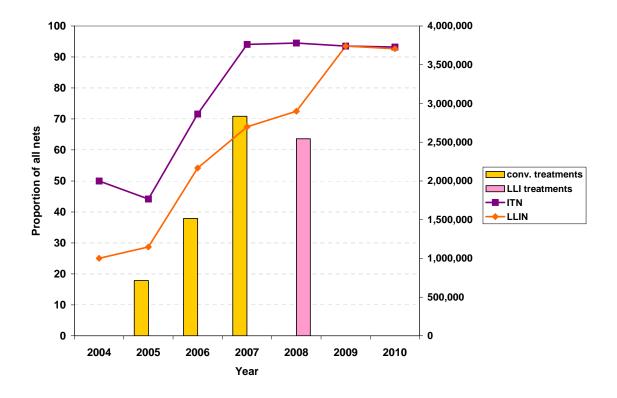


Figure 3: A possible scenario to reach coverage of more than 90% of all nets being LLIN and avoid the need of further re-treatment campaigns assuming that long-lasting insecticide kits will work.



IRS

Expanding the area covered by IRS as suggested in this document will require initially around 200,000 households to be sprayed per round increasing to 2,400,000 in 2010, a **total of 8**

million houses sprayed over the period of the plan but this figure would double if 2 spray rounds per year are implemented. The amount of insecticide units required will be 6 million if each unit serves an area of 150m².

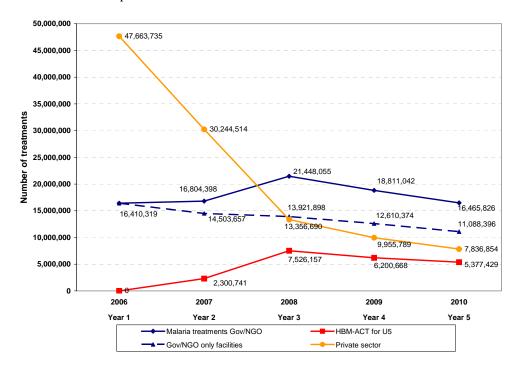
Case Management

Making estimates for requirements for case management is much more challenging than those for malaria prevention since many variables are difficult to predict such as proportion of fever cases treated as malaria, shifts in health seeking behaviour between public and private sector and the impact o malaria prevention and ACTs on malaria transmission.

The projections shown in figure 4, therefore, have to be seen with considerable caution. However, with implementation and collection of monitoring data these projections can be adjusted and will become more accurate over time.

The total number of ACT treatments provided through the government and private not-for-profit facilities as well as HBMF are estimated to rise from approximately 16 million in the first year to 29 million in 2008 and then begin to decline to 22 million in 2010. The total is estimated to be 111 million treatments over the period of the plan. This projection is based on a gradual introduction of RDT diagnosis in some settings which reaches maximum coverage in 2008 and would require a total of 34 million RDT over the 5 year period.

Figure 4: Possible scenario for the need for ACT treatments and their distribution between sectors and implementation mechanisms.



Costing of the core interventions is presented in the table below based on the scenario presented in the figures above. These cost are only rough projections since prices are very likely to change over the 5 year period, particularly for the ACT which are the largest contribution to overall cost.

ESTIMATED COST OF CORE INTERVENTIONS

The resources available for the core interventions outlined above as of 2005 are summarized in the table below including the gap needed to be filled in order to cover the estimated needs. Included in this table is also the US Government Presidential Initiative on Malaria (PMI) although exact amounts to be committed are not yet known.

Intervention	Year 1	Year 2	Year 3	Year 4	Year 5	Total
LLIN/ITN free	24,120,000	41,272,467	20,374,328	30,926,004	20,788,000	137,480,799
LLIN/ITN subsidized	2,700,000	2,700,000	3,300,000	4,200,000	4,500,000	17,400,000
Net retreatment	1,470,000	2,440,000	2,280,000	2,110,000	850,000	9,150,000
IRS	3,120,000	12,000,000	20,000,000	30,000,000	40,000,000	105,120,000
ACT s	34,402,500	32,782,500	28,687,500	22,545,000	22,507,500	140,925,000
Quinine	1,450,000	1,480,000	1,110,000	980,000	860,000	5,880,000
RDTs	300,000	3,480,000	5,290,000	4,970,000	2,780,000	16,820,000
Lab reagents	106,000	140,000	160,000	180,000	200,000	786,000
IPT	170,000	180,000	200,000	220,000	240,000	1,010,000
Environmental Management	0	3,000,000	4,000,000	6,000,000	6,600,000	19,600,000
Subtotal	67,838,500	99,474,967	85,401,828	102,131,004	99,325,500	454,171,799
IEC	5,603,000	8,394,758	6,107,000	5,564,000	4,123,000	29,791,758
M&E	2,801,500	3,473,000	3,053,500	2,782,000	2,061,500	14,171,500
Research	600,000	1,400,000	1,400,000	1,800,000	2,400,000	4,360,000
Training & supervision - 8%	4,482,400	5,556,800	4,885,600	4,451,200	3,298,400	22,674,400
Subtotal	13,486,900	18,224,558	14,846,100	13,997,200	11,882,900	72,437,658
Operational Costs 12%	9,759,048	14,123,943	12,029,751	13,935,384	13,345,008	63,193,135
Subtotal	91,084,448	131,823,468	112,277,679	130,063,588	124,553,408	589,802,592

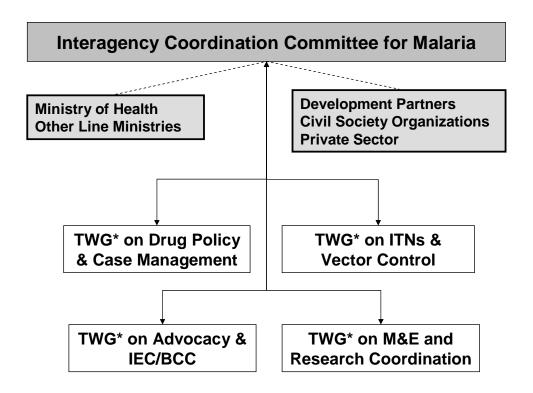
SOURCE OF FUNDING

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Multi & bilateral projects	2,000,000	6,000,000	7,000,000	6,000,000	5,000,000	26,000,000
GFATM round 2	12,000,000	13,000,000	0	0	0	25,000,000
GFATM round 4	35,000,000	32,000,000	30,000,000	29,000,000	0	126,000,000
PMI	7,500,000	19,000,000	20,000,000	20,000,000	20,000,000	86,500,000
Government & budget support going to malaria control	3,500,000	4,500,000	5,000,000	6,000,000	6,000,000	25,000,000
TOTAL	60,000,000	74,500,000	62,000,000	61,000,000	31,000,000	288,500,000
Gap	31,084,448	57,323,468	50,277,679	69,063,588	93,553,408	301,302,592

Annexes

3.4. RBM Partnership coordination (ICCM)

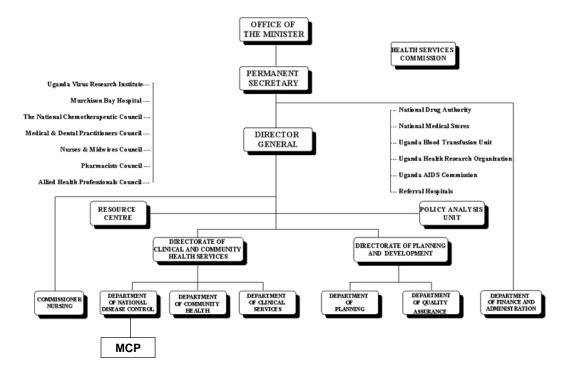
The National Roll Back Malaria Partnership



^{*} TWG: Technical Working Group

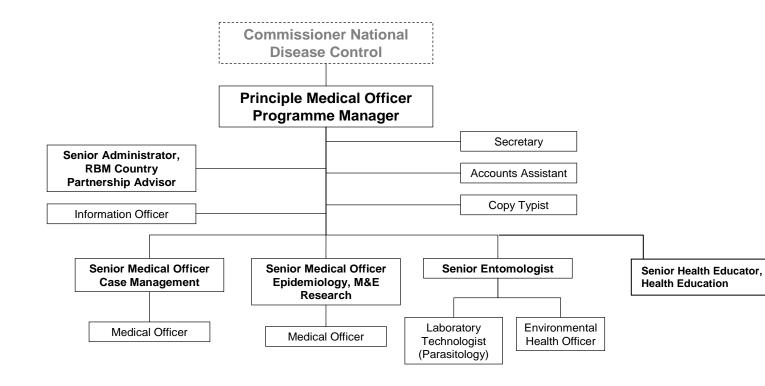
3.5. Structure of MOH

MACRO STRUCTURE OF THE MINISTRY OF HEALTH



3.6. Structure of NMCP

Current Structure of the National Malaria Control Programme



3.7. Logical Framework Uganda Malaria Control Strategic Plan

Structure	Objectively verifiable indicators	Means of verification
Goal		
To control and prevent malaria morbidity and mortality, minimize social effects	Infant Mortality Rate	Population Surveys
and economic losses attributable to malaria in the country	Under Five Mortality Rate	
Overall Objectives		
To go to national scale with a package of effective and appropriate interventions	Proportion of children under 5 having	National and local
to promote positive behaviour change and to prevent and treat malaria	slept under an ITN the previous night	household surveys
To rapidly achieve and sustain high coverage levels for this intervention package		
Specific Objectives		
Prevention		
Objective 1 : To rapidly go to national scale with insecticide treated nets in areas of moderate to very high malaria transmission using a mix of distribution	Proportion of households with at least 1 ITN	National and local household surveys
mechanisms and to sustain high coverage rate with a continuous "replacement"	IIII	nousenoid surveys
distribution		
Objective 2: To increase the proportion of LLIN among all mosquito nets to a	Proportion of LLIN among all	Commercial sector
level that makes further re-treatment campaigns unnecessary.	distributed and sold nets	data, output from public
lever that makes further to treatment earnpaigns anneoessary.	distributed and sold field	sector and CS
Objective 3: Establish and sustain a system of at least annual, high quality IRS	Number of districts covered	Implementation reports
services that cover at least 85% of all targeted structures, in areas of unstable		
transmission, whilst piloting in stable malaria transmission areas and scaling up where feasible.		
Objective 4: Complement ITN and IRS with selective environmental management	Number of settings identified for	Implementation reports
where a significant proportion of breeding sites can be identified and targeted and	environmental management	
where measures can be sustained.		
Case Management		
Objective 5: Ensure access by all to Artemisinin-based combination therapy	Proportion of patients using ACT for	Household surveys
(ACT) including those accessing treatment through the commercial sector	malaria treatment (by sector)	·
Objective 6 : Enhance the prompt treatment of children under 5 within 24 hours of	Proportion of U5 with adequate	Household surveys
fever onset through the provision of home-based management of malaria fever	treatment within 24/48 hours	-
using ACT		
Objective 7: Reduce case fatality of severe malaria by establishing a system to	Case fatality rate of malaria patients	HMIS records
provide highly effective pre-referral treatment (e.g. rectal Artesunate) and improve	by age group	
the management capacity for severe malaria at health facilities and hospitals		

Structure	Objectively verifiable indicators	Means of verification
Objective 8 : Increase the proportion of malaria cases confirmed by high quality clinical and parasitological diagnosis guided by feasibility and cost-effectiveness	Proportion of clinically suspected malaria confirmed by microscopy or RDT	HMIS records
Malaria in Pregnancy		
Objective 9 : Increase coverage with at least two doses of intermittent preventive treatment (IPT) 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	Proportion of pregnant women attending ANC services (new visits) receiving 2 doses of IPT	HMIS records
Objective 10 : Emphasize the prevention of malaria with ITNs among pregnant women by including distribution mechanisms suitable for this target group and promote the regular and correct use of the nets	Proportion of pregnant women having slept under an ITN the previous night	Household surveys
Malaria Epidemics		
Objective 11: Prevent epidemics of malaria in areas of very low and/or unstable malaria through regular application of IRS and strengthen the system of early detection and prompt response in those epidemic prone areas where IRS is not yet established	Proportion of reported outbreaks of fever in epidemic prone areas that are investigated and responded to within 5 working days	District records and reports
IEC & Social Mobilization		
Objective 12 : Raise the profile of and demand for malaria control interventions through targeted, well designed communication campaigns and activities with special emphasis on the biologically and economically vulnerable	Proportion of households with adequate knowledge on malaria control interventions (by SES)	Household surveys
Objective 13: Support active community participation in malaria control activities	Number of community initiatives	Best practices documentation
Health System		
Objective 14 : Strengthen the leadership role of the NMCP to promote partnership and coordination for malaria control at all levels of the health system	Proportion of planned Inter-agency Coordination Committee for Malaria (ICCM) that have taken place	Minutes of meetings and quarterly reports
Objective 15 : Contribute to the strengthening of a decentralised health system that can deliver quality services and effectively manage supplies through the NMCP and malaria zonal coordinators.	Health League Table scores by district	HMIS and local government records
Objective 16 : Strengthen capacity of district malaria focal persons and zonal coordinators to promote and coordinate malaria control activities at district, health sub-district, subcounty and community levels.	Proportion of functional zonal coordinators and active district coordinators	Supervision records

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Structure	Objectively verifiable indicators	Means of verification
Objective 17 : Strengthen capacity of regulatory bodies such as National Drug Authority and the National Bureau of Standards to monitor the quality of malaria medicines, ITN and insecticides used for malaria control	Number and proportion of quality tests undertaken	Annual reports of agencies
M&E and Research		
Objective 18 : Improve collection, quality and utilization of routine data to monitor the implementation of malaria related interventions through the Health Management Information System and other sources including Demographic Surveillance Sites (DSS), sentinel sites and the private sector	Completeness of HMIS records	Resource Centre MOH reports
Objective 19 : Strengthen links between the research community and RBM partners in order to ensure that ongoing research is oriented towards the key operational questions and can provide the necessary evidence to continuously improve interventions for malaria control	. •	Minutes of meetings