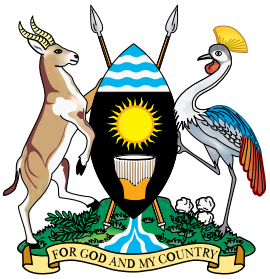
THE REPUBLIC OF UGANDA

Ministry of Health

UGANDA MALARIA PROGRAM REVIEW REPORT 2001-2010

MAY 2011



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LIST OF ACRONYMS

ACT	Artemisinin-based combination Therapy
AQUAMAT	African Quinine Artesunate Malaria Treatment Trial
CAPSS	Consortium for ACT Private Sector Subsidy
DFID	Department for International Development
DLFP	District Laboratory Focal Person
DOTs	Directly Observed Therapy
DP	Dihydroartemisinin/Piperaquine
EIR	Entomologic Inoculation Rate
EMLU	Essential Medicines List of Uganda
EPR	Epidemic Preparedness and Response
EQA	External Quality Assurance
GFATM	Global Fund for AIDs, Tuberculosis and Malaria
DHMT	District Health Management Team
DHT	District Health Team
DHO	District Health Officer
HBMF	Home-based management of fever
HC	Health Centre
HPAC	Health Policy Advisory Committee
HR	Human Resource
HSC	Health service Commission
HSSP	Health Sector Strategic Plan
HW	Health Worker
ICCM	Integrated Community Case Management
IDI	Infectious Disease Institute
IPTp	Intermittent Preventive Treatment in pregnancy
ITN	Insecticide treated mosquito nets
JHU –CCP	John Hopkins University –Centre for Communication Partnership
KCCA	Kampala City Council Authority
JUMP	Joint Uganda Malaria Project

LFP	Laboratory Focal Person
LLIN	Long Lasting Insecticidal mosquito nets
MACIS	Malaria and Childhood Illnesses Secretariat
MiP	Malaria in Pregnancy
MFP	Malaria Focal Person
MoH	Ministry of Health
MPR	Malaria Program Review
NCRL	Natural Chemotherapeutic Research Laboratory
NMCP	National Malaria Control Program
OPD	Out Patient Department
ORS	Oral Rehydration Salt
PACE	Programme for Accessible health, Communication and Education
PMI	President's Malaria Initiative
SMP	Stop Malaria Project
SURE	Securing Ugandans' Rights to Essential Medicines
QA	Quality Assurance
RDT	Rapid Diagnostic Test
SEQUAMAT	South East Asia Quinine Artesunate Malaria Treatment Trial
ToT	Training of Trainers
TPR	Test Positivity Rate
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UHMG	Uganda Health Marketing Group
UMHCP	Uganda Minimum Health Care Package
UMIS	Uganda Malaria Indicator Survey
UMSP	Uganda Malaria Surveillance Project
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USPA	Uganda Health Services Provision Assessment Survey
VHT	Village Health Team
WHO	World Health Organization

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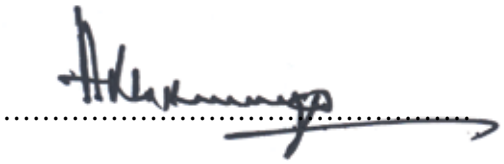
Foreword

Uganda has seen a progressive scale up of malaria control interventions in the last decade, most especially in the use of ACTs in the public sector, ITN distribution, and in some districts, IRS. To ensure accessibility and affordability, ACTs have also been extended to the private sector at a highly subsidized cost. It is important to note that this expansion has been made possible by the increased commitment to malaria control by government, in-country malaria stakeholders and bilateral and multilateral partners. However, the revelation by the recent Malaria Indicator Survey (MIS) that the mean value of malaria parasite prevalence is 43% in children aged below five years and the findings of this MPR report that there has been a minimal reduction in malaria morbidity over the last ten years, are a clear signal to all partners and stakeholders to do even more in the fight against malaria in Uganda.

This Malaria Program Review report serves as an eye opener to the Ministry of Health that together with partners in this country we need to do things differently if we are to achieve both national and global malaria targets as we consolidate malaria control and eventually move to malaria elimination. The absence of a significant impact in the last ten years in the presence of a multitude of partners and increasing funding from both government and global initiatives demonstrates the need for a more coordinated and pragmatic approach in planning, funding, implementation and systematic monitoring and evaluation.

While appreciating the existing partnership and efforts of all stakeholders in the last ten years, I urge everyone to ensure that the momentum gathered is not lost.

I would like to implore all malaria partners to embrace and support the action points and recommendations made in this report through provision of additional resources and technical support and to fulfil all the commitments spelt out in the A*ide Memoire*.



Dr. Lukwago Asuman
Ag. Permanent Secretary
Ministry of Health

Preface

It's indeed gratifying to note that Uganda joined the list of the first countries in Africa to undertake a comprehensive review of the performance of the National Malaria Control Programme. The MPR process covering the period October 2010 to May 2011 went through the standard phases of preparation and planning, thematic desk reviews and field visits to validate the desk review findings. The report brought out key achievements made and underscored key challenges faced over the review period. Eventually, the process culminated in the signing of an aide memoire by the Ministry of Health and representatives of in-country RBM partners to signify an agreed joint action towards fulfilling the recommendations of the review. These recommendations and action points will require strengthened technical support and additional financial resources as we strive to work towards attainment of regional and global malaria control and elimination targets.

On behalf of the Ministry of Health I would like to re-affirm our full commitment towards the implementation of the recommendations and action points and the MOH will provide the needed leadership, guidance and coordination to the entire malaria partnership in this regard.

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Dr Aceng Jane Ruth

Director General Health Services

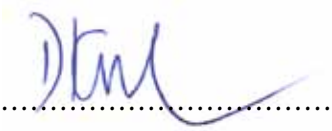
Acknowledgements

This MPR report is a result of the joint efforts and contributions from several in-country and external RBM partners involved in malaria control.

The Ministry of Health wishes to acknowledge and thank RBM and the President's Malaria Initiative (PMI) for their financial support, and WHO for technical contribution.
Special thanks go to the external reviewers; Mr. Khoti Gausi, Dr. Peter Olumese, and Dr. John Govere of WHO, Dr. Stephen Munga of KEMRI and Ms. Pauline Mwamuleme of NMCP-Zambia, whose contribution enriched the findings of this review.

The overall coordination role in this exercise by the Programme Manager, Dr. Seraphine Adibaku is highly appreciated. The thematic desk reviews were led by the respective intervention-team leaders within the NMCP. In addition, the contribution of the under listed persons whose unreserved intellectual and technical input in all the phases of the review which resulted into a report and Aide Memoire is highly appreciated;- Dr. Denis Rubahika, Dr. Myers Lugemwa, Dr. Ebony Quinto, Dr. Fred Ssebisubi, Ms.Mariam Nabukenya, Mr. Keneth Byoona, Mr. Hassan Musobya, Ms Lucia Baguma , Ms.Connie Balayo, Ms. Agnes Netunze, Dr. Patrobas Mufubenga, Dr. Albert Peter Okui, Mr. Bosco Agaba, Ms. Grace Edyegu, Ms. Mary Byangire, Mr. Medard Rukari, Mr. Muggaga Malimbo, Dr. Jane Nabakooza, Mr. Tom Byembabazi, Mr.Michael Okia, Mr. William Lali Zira, Dr. Miriam Ssentongo and Ms. Miriam Namugere (MOH); Dr. John Bosco Rwakimaari and Mr. Richard Onen-Ocan (Abt Associates.inc); Dr. Kojo Lokko (JHU-CCP); Mr. Abdul Shafiq (Vestergaard Frandsen/ Nettshoppe); Dr. Godfrey Magumba Ms. Clare Riches, Dr. James Ssekitoleko, Ms. Agnes Ssubi and Ms. Grace Nakawangi (Malaria Consortium); Dr. Anthony Okoth (Mulago Hospital); Mr. Badru Mukasa (KCC); Mr. Dennis Kakooza and Mr. Henry Ssemwanga (PACE); Dr Sam Siduda, Mr. Keneth Mulondo and Ms. Phellister Nakamya (SMP); Dr. Achan Jane and Dr. Ann Gassasira (UMSP); Mr. Eric Jemera (SURE); Dr. Patrick Okello, Dr. Gunawardena Dissanayake and Dr. Susie Nasr (PMI); Mr. Charles Otim (Meteorological Department)**;** Mr. James Turyeimuka (Kabale District); Mr. James Ahimbisibwe (Masaka District); Dr. Ruth Nassanga (Mpigi District); Dr. Grace Nambatya (NCRI); Ms. Enid Wamani and Dr. Denis Kintu (MACIS); Dr. Umar Ssekabira (IDI); Dr. Espilidon Tumukurate (UHMG); Dr. Hassan Nasur (NUMAT); Dr. Flavia Mpanga (UNICEF); Dr. Kaggwa Muggaga **,** Mr. Nathan Natseri, Dr. Miriam Nanyunja, Dr. Juliet Bataringaya and Dr. Charles Katureebe (WHO) and Dr. Andrew Balyeku (Internal Consultant).

Lastly but not least, the Ministry of Health appreciates the contributions of heads of bilateral and multi lateral partners, DHOs, Medical Superintendents, in-charges of health facilities, and the communities visited, for their invaluable inputs in the review process.



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Dr. D.K.W. Lwamafa
Commissioner, National Disease Control
Ministry of Health

Executive Summary

Background, purpose and methodology

The Ministry of Health and its partners conducted a comprehensive review of the progress and performance of the malaria programme for the period 2000 to 2010 with the aim of assessing the current strategies and activities and the progress made in achieving targets in reducing malaria burden in Uganda. Specifically, the objectives of malaria programme review were to review the epidemiology of malaria in Uganda; to assess progress made towards achievement of targets; to review the organization, and management framework of the national malaria programme for malaria control within the health system and the national development agenda; and to define the next steps for sustaining and improving program performance.

The review was conducted in three phases; planning, desk reviews with the production of the thematic reports; and finally the intensive field review with the help of external reviewers. Field visits were undertaken to district hospitals, health centres and communities to validate findings of the desk reviews.

Key Findings

Malaria epidemiology

Malaria is endemic in the entire country except a few areas of low transmission that are prone to epidemics with a mean malaria parasite prevalence rate of 45% in children under the age of 5 years (range 5% in Kampala to 63% in mid northern region). Reported malaria cases from outpatient department have increased from 28% in 2001 to 45% in 2010 and parasitological testing for malaria has minimally increased from 5% in 2001 to 24% in 2010. The average positivity rate is at 45%. The review was unable to describe impact on malaria admissions and deaths because this data is not routinely reported to the Resource Centre at the Ministry of Health.

Intervention Coverage

Intervention coverage has generally increased over the years with the proportion of households with at least one ITN increasing from 12.8% in 2001 to 46.7% in 2010, and the proportion of children under the age of 5 years who slept under an ITN the previous night increasing from 7.3% in 2001 to 32.8% in 2010. The proportion of households with at least one ITN and /or sprayed by IRS in the last 12 months was 49.2% in 2010. The number of districts who use spraying has remained 10 at a maximum with enviable operational coverage of around 90%. The proportion of under 5s with fever in the last 2 weeks who received any anti-malarial treatment remained at comparable levels of 61.3% in 2006 and 59.6% in 2010. About 24% of the malaria cases are tested in Uganda and the proportion of children under 5 years old with fever in the last 2 weeks who received antimalarials treatment according to national policy (using ACT) within 24 hours from onset of fever from 29% to 3.2% in 2006 and 2010 respectively. The proportion of women who received intermittent preventive treatment for malaria during ANC visits during their last pregnancy (IPTp2) increased from 16% in 2006 to 31.7% in 2010.

Malaria Programme Management, Policies and Strategies

Over the last ten years NMCP has implemented two Malaria Strategic Plans (MSP) 2000/1 – 2004/5 and 2005/6 - 2009/10. Uganda's Malaria control policy and strategic plan expired in 2010. The Uganda NMCP has mobilized funding from the government and the Global Fund, the United States President's Malaria Initiative and DFID. The World Health Organization and other technical partners have provided technical assistance to boost malaria policy and implementation. The GoU waived taxes and tariffs on several anti-malarial commodities and user fees in public health facilities were abolished to increase access to health services especially for the poor. The national RBM partnership is functional and meets regularly. Zonal coordinators and district malaria focal persons were established to strengthen implementation

of malaria control activities. However, the positioning of the NMCP within the MoH organogram is low resulting in a minimized mandate and authority to head, coordinate partners and guide malaria policy and implementation. The NMCP does not develop annual integrated work plans and its organogramm is outdated. Within the NMCP team work is weak and has led to a breakdown in leadership. Malaria activities are often implemented by the central level even where the districts are mandated and/or most appropriate for implementation.

Vector control

Vector control in Uganda combines the use of indoor residual spraying (IRS), long lasting insecticidal nets (LLINs) and on a limited scale, larval source management. LLINs and IRS are mainly supported by partners. IRS was reintroduced in 2006 and has been expanded to 10 districts protecting approximately 3 million people.

Since 2009 Uganda is targeting universal access by the whole population to LLINs. In 2010, the program distributed more than 7.2 million LLINs. However, there is limited routine distribution of LLINs to pregnant women and children under 5 through the ANC and EPI services. Infrastructure for effective and routine entomological monitoring on mosquito bionomics is inadequate and there are no policy guidelines for integrated vector management.

Malaria Case Management

Malaria case management policy evolved from chloroquine (CQ) monotherapy to CQ+SP to ACTs during the review period and the policy on malaria diagnosis has changed from clinical to parasitological based diagnosis. Home based management of fever (HBMF) introduced in 2002 has now been incorporated into Integrated Community Case Management (ICCM). Uganda is also benefiting from phase 1 of AMFm. However, there are frequent stock-outs of antimalarial medicines and supplies at health facilities and community level as well as non- availability of RDTs. The NMCP still has challenges in integrating private sector providers into national case management programme and severe malaria management below HCIV level remains a challenge.

Malaria in Pregnancy

Implementation of Intermittent Preventive Treatment in pregnancy (IPTp) started in 2001. To date routine distribution of ITNs through ANC remains limited and there is poor coordination between the Reproductive Health Division and NMCP. Stock outs, and/or the non-stocking of SP in ANC services have also hindered the implementation of IPT.

Epidemic preparedness and response

Since 2000, six epidemics have occurred in Uganda. The most recent malaria epidemic took place in 2009/10 in Mubende District. A malaria surveillance system generates weekly data from all health facilities and epidemic thresholds have been developed in epidemic prone districts, although the values are still based on clinical cases. Also, there are no malaria EPR guidelines and plans.

Procurement and Supply Management

All antimalarial medicines and laboratory commodities in the policy are listed on the Essential Medicines List of Uganda and are available through the NMS, JMS and the private sector. ACTs and SP are part of the tracer medicines for monitoring the Annual Health Sector Performance. The Public Procurement and Disposal of Public Assets (PPDA) act is currently being revised to address delays in medicines procurement.

However, the availability of malaria commodities at service delivery points remains a problem largely due to poor coordination and collaboration between the NMCP, Pharmacy Division (PD), Procurement Unit (PU) and NMS. There is lack of up-to-date data on the country malaria burden to guide forecasting and quantification. Also chloroquine is supplied to health facilities leading to its use for malaria treatment against the current recommendation by the MOH.

Advocacy Communication and Social Mobilization

The NMCP has a focal point person responsible for overseeing malaria communication strategy and guidelines for implementation of advocacy and social mobilization. There is a functional advocacy and social mobilization working group at national level. The NMCP had a malaria newsletter and notice board which are no longer functional. There is a Parliamentary malaria subcommittee of the Social Services Committee. Uganda commemorates the Africa Malaria Day/World Malaria Day annually with high level political participation. However, BCC implementation is often done without operational research to guide it. In addition, the review found that Uganda implements IEC/BCC in an ad hoc fashion which weakens the impact of social mobilization interventions.

Surveillance, Monitoring and Evaluation and Operations Research

The NMCP over the last ten years has implemented two Malaria Strategic Plans (MSP) 2000/1 – 2004/5 and 2005/6 - 2009/10. In 2004, a national malaria research centre (MRC) was established, an M&E plan developed in 2008 and a malaria indicator survey conducted in 2009.

Malaria data remains inadequate, untimely and incomplete due to the weaknesses that exist in the HMIS. Data on in-patient malaria admissions and deaths is not being systematically collected. No system exists for collecting and integrating data from the private sector, which provides services to more than 50% of the population into the HMIS. There is no functional malaria database within the NMCP. A clear research agenda to guide programmatic implementation has not been outlined.

Key Recommendations

1) Update the national malaria policy, strategic plan and develop joint annual work plans which should be regularly reviewed by joint annual review and planning meetings involving all malaria stakeholders including districts.
2) The NMCP needs to take up its coordination and stewardship responsibilities as a national malaria programme mandated to lead, guide and coordinate malaria control efforts in Uganda.
3) To effectively do the above the MOH should elevate the NMCP to the level of a Department in the MoH where it is able to participate in key policy, technical and resource allocation decisions.
4) Government of Uganda and partners should commit more resources to malaria activities.
5) Rapidly scale-up vector control activities of LLINs and indoor residual spraying to achieve universal coverage and support rapid scale up of case management (diagnostics and medicines) to all health facilities (public and private) and at the community level.
6) Strengthen routine malaria surveillance for both inpatients and outpatients from both public and private health facilities by improving data collection, recording, analysis and reporting at health facility, district and national levels
7) Establish representative sentinel sites to monitor vector bionomics including insecticide resistance
8) The Reproductive Health Division should take a key leadership role in MiP with NMCP providing technical support.
9) Finalize the approval of the EPR guidelines and training modules and revise malaria epidemic thresholds.
10) Improve and maintain communication / collaboration between NMCP, PD, PU and NMS on PSM issues
11) NMS procurement of malaria commodities should be guided by the Ministry of Health policies and quantification of malaria commodities strengthened by using malaria burden data.
12) The Parliamentary Malaria sub-committee of the Social Services Committee should be mobilized to raise the profile of malaria. A good-will ambassador for malaria should be identified in order to raise the profile of malaria through advocacy.
13) The NMCP should revitalize previously used communication channels, document best practices and regularly update the MOH website as a way of regularly sharing information.

14) Operationalize the NMCP composite malaria database and assign responsibilities for its routine and overall management. In addition, the NMCP should develop standard reporting templates for partners to facilitate the incorporation of partner data into the NMCP database.
15) Establish and regularly update a research agenda that is disseminated to all partners

Conclusion

The MPR process comprehensively reviewed the malaria programme over the last decade. While progress has been made in the delivery of the key technical and supportive interventions, there remains a significant gap in achieving universal coverage for impact. However, the absence of quality routine data (especially from in-patient malaria cases and deaths in the light of low deployment of parasitological confirmation of malaria), does not allow for clear conclusions on the extent of the impact of the interventions Uganda has deployed so far to control malaria in the review period.

Based on the current malaria epidemiological profile, a rapid scale up of insecticidal coverage to achieve a significant level of community protection either through LLINs and/or IRS, parasitological diagnosis and prompt treatment with effective ACTs is required to achieve the vision of a Malaria-Free Uganda. Implementation of the action points in this report will enable Uganda efficiently use its available resources to significantly reduce the burden of malaria which still remains unacceptably high.

1. Introduction

1.1 Preamble

Malaria remains one of the most important diseases in Uganda in terms of morbidity, mortality and economic losses. It accounts for 30-50% of outpatient consultations, 20% inpatient admissions and 9-14% inpatient deaths. The whole population of Uganda is at risk of malaria with over 90% of the country experiencing high, stable all year round transmission while the remainder has low, unstable transmission and is also epidemic prone.

Over the last 10 years (2001-2010) Uganda adopted the RBM strategies and great efforts have been made to scale up proven malaria control and prevention interventions in order to achieve the global and regional targets for malaria control and the MDGs. A Malaria Program Review (MPR) covering the last 10 years (the Roll Back Malaria Decade) was undertaken to assess the performance of the program with a view to identifying approaches and activities that are working well and achieving outputs and outcomes, as well as those that are not working so well with a view to restrategize the Program.

1.2 Background to MPR

The Malaria Program Review (MPR) is a periodic joint programme management process for reviewing progress and performance of country programmes with the aim of improving performance and refining or redefining the strategic direction and focus.

The Ministry of Health, through the National Malaria Control Programme (NMCP), in collaboration with partners decided to undertake a comprehensive review of the progress and performance of the malaria programme for the period 2000 to 2010. The decision was made in the context of the development of a new national malaria policy and strategy as the current versions expired in 2010. The findings of this review will feed into the development of these documents, which documents should act as a guide and a future drive towards achieving universal coverage and the maintenance thereof.

1.3 Justification for MPR

Over the past five years, malaria control interventions have been scaled-up at the national level, yet no comprehensive review of the malaria programme as a whole had been undertaken to identify approaches and activities that were working well and achieving both good outputs and outcomes, as well as those which were working less well, with a view of re-strategizing the programme. Related to this and as a result of the scale-up efforts of malaria interventions, a change in the epidemiology of malaria was apt to occur that would need to be considered for subsequent planning phases.

Secondly, the year 2010 marked a decade since the Abuja Universal Coverage targets were set. With the Millennium Development Goals (MDGs) 2015 targets being only five years away, this MPR was a timely intervention to document achievements so far made and to reposition the programme as required.

Thirdly, due to increased funding through bilateral and multilateral partners and through global initiatives like the Global Fund to fight AIDS, TB and Malaria (GFATM) and the President's Malaria Initiative (PMI) there

has been a growing number of malaria partners involved in malaria implementation activities. There was, therefore, urgent need to review the impact the increased funding has had on performance and outcomes. The MPR would also help establish the performance of the RBM partnership with a view of realigning their focus and efforts.

Fourthly, aware that programme management is one of the cornerstones for effective performance, it was noted that since the creation of the malaria programme in the MOH, there have been several reforms and innovations, including decentralisation, as well as frequency in changing programme leadership. New levels of staff with responsibility for malaria had been introduced, including malaria focal persons at the district level and malaria zonal coordinators at the regional level. It was envisaged that the MPR would help assess the management of the malaria programme at all levels of the health system.

Finally, the current malaria strategic plan and M&E plan have both expired in 2010. In 2009, the NMCP together with partners conducted the first Uganda Malaria Indicator Survey. There was, therefore, a need to now conduct a programme review to compliment the UMIS and form a basis for the development of a new malaria policy, a new strategic plan and M&E Plan (2011-2015).

1.4 Objectives

The general objective of the MPR was to review the current status of malaria, its control and its management framework in Uganda and to identify achievements, best practices, challenges and possible solutions to guide future malaria control strategic planning.

Specifically, the MPR Objectives were to review the epidemiology of malaria in Uganda; to assess progress towards achievement of national, regional and global targets by intervention thematic areas and service delivery levels; to review the structure, organization, and management framework for malaria control within the health system and the national development agenda; and to define the next steps for sustaining and improving program performance.

1.5 Methodology

The MPR was conducted in 4 phases namely; planning and preparation (Phase 1), thematic desk reviews (Phase 2); field visits to validate thematic reports (Phase 3) and report writing and other follow up actions (Phase 4).

1.5.1 Phase One: Planning and Preparation

The first phase of planning started in October 2010 when a costed plan/proposal was sent to WHO/AFRO requesting for funds. During this phase, consultative meetings were held with partners to define the need for the review and to develop terms of reference (TORs). Thematic review groups were formed in order to review program strategies. These groups were comprised of mainly partners under the leadership of the NMCP. All thematic groups were chaired by partners involved in specific malaria control strategies and the Malaria Control Program served as a secretariat. ToRs were developed and validated in a stakeholders meeting. The plan and budget were submitted to the RBM, the Ministry of Health and other partners for funding.

1.5.2 Phase Two: Thematic Desk Reviews

The second phase started on 1st May 2011 and ended on 18th May 2011. This phase involved selecting tools for the desk review and conducting the thematic desk reviews. Two retreats were organized to carry out the thematic reviews and finalize the reports. This desk review identified recent progress made in achieving set

targets for access, coverage, quality, use and impact. It also allowed the program to identify best practices and problems/challenges. Analysis and prioritization of the problems/challenges were carried out and appropriate solutions proposed. This phase revealed information weaknesses and gaps and these formed the focus for the field review phase.

1.5.3 Phase Three: Field Review

The third phase begun immediately after the thematic desk reviews. It involved briefing of the external review team followed by in-depth discussions on the findings of the thematic review. This ensued team-building between internal and external review teams, consensus-building on findings of thematic internal desk review, familiarization with data collection tools for field visits, formation and briefing of teams for the field review. The field visits were carried out at two levels. One involved central level visits to national institutions and organizations where heads of those institutions were engaged in in-depth interviews on malaria control issues including best practices and challenges. The other level involved district and community field visits to malaria service delivery points. At the central level, some of the institutions visited included; PMI, DFID, WHO, UNICEF, SMP, UHMG, PACE, Malaria Consortium, NMS, JMS, MOH PS and Resource centre, MACIS, AMREF and the School of Public Health among others. Based on endemicity level, 8 districts were visited namely: Kampala, Kabale, Kyenjojo, Apac, Moroto, Arua, Mubende, and Tororo, In each district, in-depth discussions including review of records were done at DHT level, District Hospital, HC 4, HC 3, HC 2, VHT and FGD with the community. Later, teams re-converged and shared field reports through plenary presentations on key findings. Thereafter, thematic review reports were updated with this information to ensure completeness, and then drafts of the final report, executive summary, aide-memoire and slide presentation of key findings and recommendations prepared. The aide memoire was circulated to stakeholders for study and internalization two days before the signature date. The slide presentation and aide memoire were presented to senior and top management members of the MoH for final input. The updated slide presentation and aide memoire were presented to the RBM partners together with heads of key development partners including WHO, Unicef, USAID and DFID. In the same meeting a ceremony for signing the aide-memoire by the heads of the key development partners and representatives of the RBM Partnership took place.

The aide memoire (Annex 2) was signed by the Permanent Secretary (MOH) on behalf of GoU, WHO Representative, UNICEF Representative, DFID Deputy Head of Mission, USAID Health Team leader, UHMG Executive Director, PACE Executive Director, Malaria Consortium Country Director, Private sector Representative and MACIS Coordinator.

1.5.4 Phase 4: Follow-Up

Phase 4 will start with finalizing, publishing and disseminating of the report. These will be followed by implementation of the recommendations by all partners.

The sections that follow consist of key findings and action points per intervention area in the following order; epidemiology of malaria; Program support and management; program performance by thematic areas – malaria vector control, malaria diagnosis and treatment, epidemic preparedness and response, supply chain management, advocacy, communication and social mobilization, and surveillance, monitoring and evaluation; Each thematic area has action points but the report also ends by emphasizing a number of key action points and key recommendations.

2. EPIDEMIOLOGY

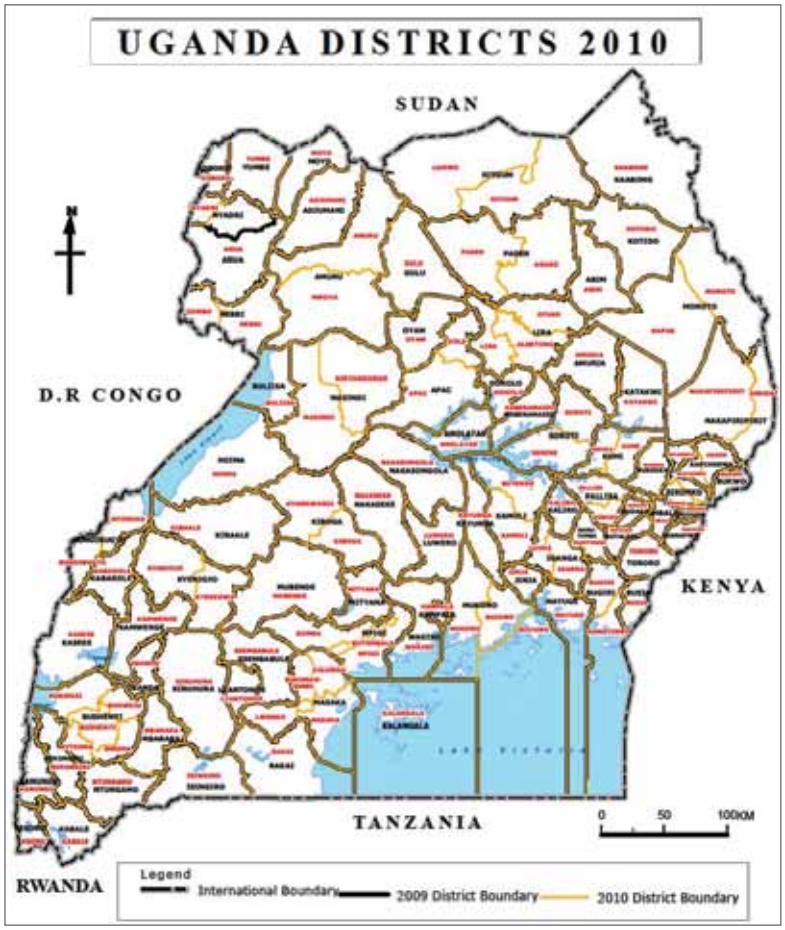
2.1 Epidemiology of Malaria

2.1.1 Location, Political and administrative boundaries

Uganda lies between 1° south and 4° north of the equator. It is bordered by South Sudan in the north, Kenya in the east, the Democratic Republic of Congo in the west, and Tanzania and Rwanda in the south. Uganda has a surface area of 241,039 square kilometers and has a tropical climate with two rainy seasons (March to June, and September to November) with an average temperature of 25o C with rainfall peaking in March to May and September to December.

Uganda has a relatively high altitude (1,300-1,500 meters above sea level), and experiences a favorable tropical climate with mean annual temperatures between 16°C in the southwest; 25°C in the centre, east, and northwest; and close to 30°C in the Northeast. These two peaks of rainfall correspond with peak rates of malaria transmission.

Figure 1: Map showing political and administrative boundaries of Uganda



Source: Ministry of Local Government, July 2010

2.1.2 Population at Risk of Malaria

The entire population of Uganda is at risk of malaria with children under five years of age; pregnant women; and people living with HIV/AIDS as the most at risk.

Uganda's population has increased from near 23 million in 2002[1] to more than 31 million in 2010.

Table 1: Key demographic characteristics regarding risk to malaria

Year	Population	< 5 yrs	Pregnant women
2000/01	22,845,618	4,249,285	1,142,281
2001/02	24,227,000	4,506,222	1,211,350
2002/03	25,026,491	4,654,927	1,251,325
2003/04	25,852,365	4,808,540	1,292,618
2004/05	26,705,493	4,967,222	1,335,275
2005/06	27,586,774	5,131,140	1,379,339
2006/07	28,497,138	5,300,468	1,424,857
2007/08	29,437,544	5,475,383	1,471,877
2008/09	30,408,983	5,656,071	1,520,449
2009/10	31,411,989	5,842,630	1,570,599

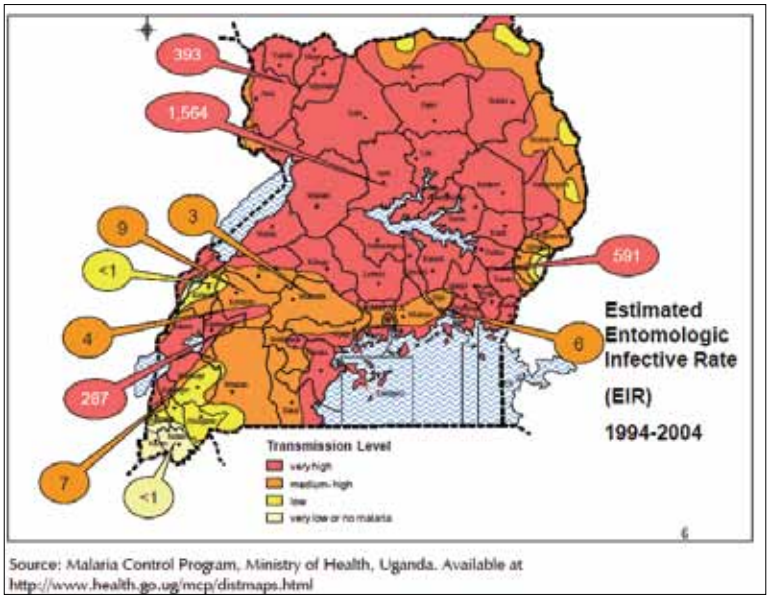
Source: UDHS, 2001; UDHS, 2006

Uganda has a decentralized form of government with 56 districts in 2000, 80 in 2006 and 112 in 2010.

2.1.3 The Burden of Malaria

Malaria transmission in Uganda is perennial. About 70% of the county experiences v*ery high transmission* levels with more than 100 infective bites per person per year, 20% experiences m*edium to high transmission* levels with 10-100 infective bites per person per year; and 10% l*ow transmission* with less than 10 infective bites per person per year (citation Okello et al). A MIS conducted in 2009 identified high prevalence of malaria parasites among children less than 5 years, ranging from 5% to 63%.

2.1.4 Malaria Parasites and Vectors



Source: Malaria Control Program, Ministry of Health, Uganda. Available at http://www.health.go.ug/mcp/distmaps.html

Figure 2: Estimated EIR

All the four species of malaria parasites exist in Uganda. *Plasmodium falciparum* is the most prevalent accounting for 99% of all reported malaria cases. Plasmodium *malariae accounts for 2%, P. vivax* 2% and *P. ovale* <1% (MIS, 2009). Co-infections with different species of plasmodium were demonstrated with a regional variation of as low as 0.3% in 2 Central regions to as high as 6% in mid northern regions.

The commonest vectors in Uganda are members of *Anopheles gambiaes.l.* and members of *Anopheles funestus group. Anopheles gambiae s.s., Anopheles funestus and Anopheles arabiensis* are the main malaria vectors in Uganda.

[1]*Uganda Demographic and Health Survey 2002.*

2.1.5 Stratification

The EIR 1994-2004 and MIS 2009 are the only available sources of information on mapping and stratifying malaria risk as shown in Figure 2 below. The programme has not adopted a system for routine and periodic monitoring of malaria risk in the country.

Figure 2: Map showing geographical spread and eco-epidemiological strata of malaria in Uganda

EPIDEMIOLOGICAL STRATIFICATION BASED ON PARASITE PREVALENCE AMONG THE U5S (UMIS 2009)

MAIN MALARIA VECTOR SPECIES AND DISTRIBUTION

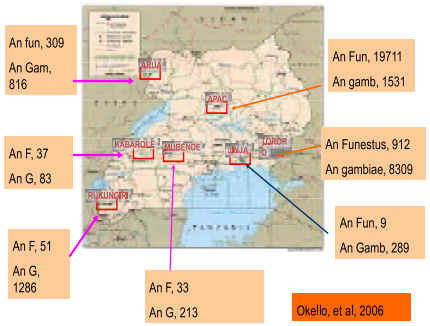
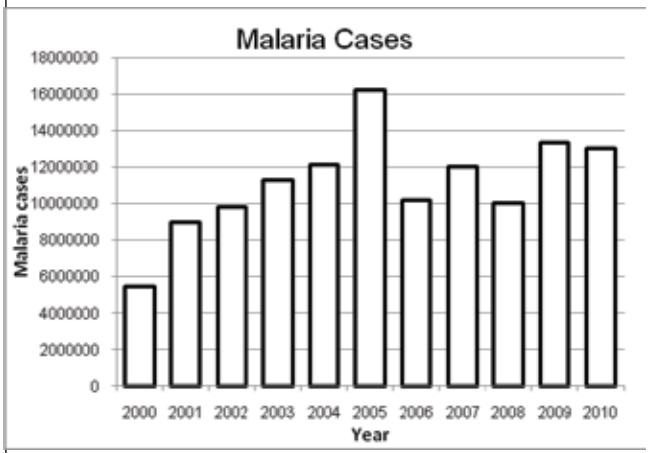


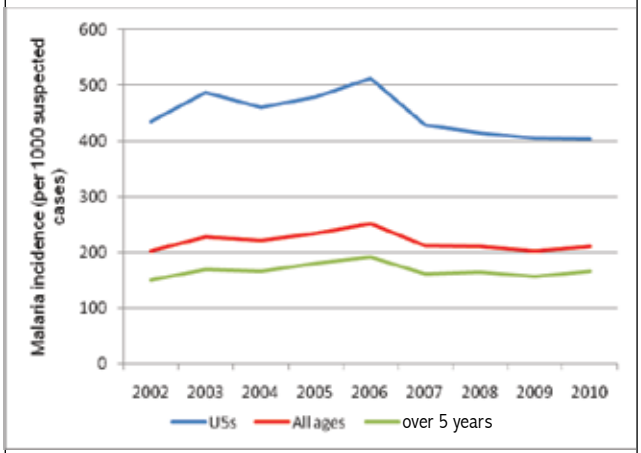
Figure 3 below shows the trends of malaria suspected and confirmed cases from public health facilities. From 2000-2005 there was a marked increase in malaria cases occasioned by increasing chloroquine resistance and El Nino in 2005. However with the change in treatment policy from CQ + SP to use of more efficacious drugs (ACTs) the number of cases flattened out from 2006 - 2010..

Figure 3a: All age reported malaria cases in HMIS by calendar year)



Source : MOH HMIS Resource Centre

Figure 3b: Confirmed incidence malaria cases by age group (per 1000 suspected malaria cases)



In terms of malaria mortality trends the current HMIS forms provide for collection of the data on inpatient and mortality in health facilities, however this data is not routinely reported in the HMIS which is the main source of epidemiological data.

2.1.6 Socio-economic impact of malaria

Malaria causes significant economic losses, and can decrease gross domestic product (GDP) by as much as 1.3% in countries with high levels of transmission[1]. Malaria accounts for 26% of the burden of disease in Uganda (BOD Uganda, 1995). In the Eastern part of Africa, where malaria epidemics mostly occur during seasons of peak agricultural activities, the disease not only excludes the sick ones from daily agricultural activities, but also the healthy ones who take care of their sick family members and relatives. It is estimated that workers suffering from a malaria bout can be incapacitated for 5-20 days. The lack of enough manpower during peak agricultural activities decreases productivity and hence lowers income and aggravates food insecurity (WHO, 2003b). A poor malaria stricken family may spend up to 25% of its income on malaria prevention and treatment. It is estimated that 40% of health expenditures in Sub-Saharan Africa are spent on malaria treatment (Ministry of Health, 2007).

2.2 Key Issues

a) The lack of risk mapping (including using routine data) makes it difficult to identify populations at highest risk and targeting of interventions to these populations
b) Quality of HMIS data from districts is poor, and personnel skills for epidemiological monitoring and reporting are inadequate.
c) Medical data from private healthcare delivery facilities is not collected to contribute to national picture of health status.

2.3 Action Points

a) Establish a mechanism for data collection and reporting from private sector health care facilities.
b) The Malaria programme should plan for and conduct periodic risk assessments and mapping in order to assist intervention targeting

[1] *WHO Media Centre, 2010*

3. PROGRAM MANAGEMENT

3.1 The National Health System (from HSSP III)

The National Health System (NHS) in Uganda is made up of the public and the private sectors. The public sector includes all Government health facilities under the MoH, health services of the Ministries of Defence (army), Internal Affairs (Police and Prisons) and Ministry of Local Government (MoLG). The private health delivery system consists of Private Health Practitioners (PHPs), Private Not -for- Profit (PNFPs) providers and the Traditional and Complimentary Medicine Practitioners (TCMPs).

3.1.1 Structure of the National Health System

The MoH provides leadership for the health sector: it takes a leading role and responsibility in the delivery of curative, preventive, promotive, palliative and rehabilitative services to the people of Uganda.. The provision of health services in Uganda has been decentralised with districts and health sub-districts (HSDs) playing a key role in the delivery and management of health services at district and health sub-district (HSD) levels, respectively. Unlike in many other countries, in Uganda there is no 'intermediate administrative level (province, region). The health services are structured into National Referral Hospitals (NRHs) and Regional Referral Hospitals (RRHs), general hospitals, health centre IVs, HC IIIs and HC IIs. The HC I has no physical structure but a team of people (the Village Health Team (VHT)) which works as a link between health facilities and the community.

3.2 Place of Malaria Control in the National Health and Development Agenda

Malaria has a priority place in the development agenda of Uganda. Health was included in the first Poverty Eradication Action Plan (PEAP) from 1997 to 2000 where health was addressed as a key human development sector with malaria as a major priority in the sector. The subsequent revisions of the PEAP (2000, and 2005) maintained the priority accorded to health in general and malaria control in particular. The PEAP was succeeded by the National Development Plan (NDP) which has prioritized health under the Social Services Sector with malaria recognized as a leading priority within the National Minimum Health Care Package (NMHCP). In an effort to strengthen malaria control and prevention the Government of Uganda waived taxes and tariffs on ITNs leading to increased uptake through ITN outlets in the private sector. Taxes and tariffs were also waived on Insecticides, spray equipment and diagnostics. In 2001 the President directed the abolition of user fees in public health facilities and this resulted in dramatic increase in health service utilization by the poor. The President's Manifesto 2006 and 2011 include malaria eradication as a firm pledge to the people of Uganda. To strengthen malaria research the Malaria Research Centre was established in accordance with a Presidential Directive. Also, the Highland Malaria Project in the Nile Basin Countries was established to address malaria in epidemic prone areas such as in the South Western, Western and Eastern highlands of Uganda.

3.2.1 National level

The core functions of the central level MoH headquarters are:

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

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

Several functions have been delegated to national autonomous institutions such as National Medical Stores and National Public Health Laboratories, regulatory authorities such as various professional councils and the National Drug Authority (NDA) and research institutions. The Uganda National Health Research Organisation (UNHRO) coordinates the national health research agenda. The Health Service Commission (HSC) is responsible for the recruitment, deployment, promotion and management of HRH on behalf of the MoH, including handling terms and conditions of service. In the districts, this function is carried out by the District Service Commissions.

3.2.2 National, Regional and General Hospitals

The National Hospital Policy, adopted in 2005, spells out the role and functions of hospitals at different levels in the NHS and was operationalized during the implementation of the HSSP II. Hospitals provide technical back up for referral and support functions to district health services. Hospital services are provided by the Public, PHPs and PNFPs. The public hospitals are divided into three groups namely:

a) *General Hospitals* provide preventive, promotive, curative, maternity and in-patient health services, as well as surgery, blood transfusion, laboratory and medical imaging services. They also provide in-service training, consultations and operational research in support of the lower level health units and community-based health care programmes.
b) *RRHs* offer specialist clinical services such as psychiatry, Ear, Nose and Throat (ENT), ophthalmology, higher level surgical and medical services, and clinical support services (laboratory, medical imaging and pathology). They are also involved in teaching and research. These are in addition to services provided by general hospitals.
c) *NRHs* provide comprehensive specialist services and are involved in health research and teaching *in* addition to providing services offered by general hospitals and RRHs.

NRHs provide care *for* a population of 30 million people, RRHs for 2 million people while general hospitals provide for 500,000 people. All hospitals are supposed to provide support supervision to lower levels and to maintain linkages with communities through Community Health Departments (CHDs). Currently, there are 56 public hospitals: 2 NRHs, 11 RRHs and 43 general hospitals. There are 42 PNFP and 4 PHP hospitals. The operations of the hospitals at different levels are limited by lack of funding. With decentralisation, the public general hospitals are managed by the MoLG through district local governments. The RRHs, even though they have been granted self accounting status, are still managed by the MoH headquarters. The NRHs, namely Mulago and Butabika, are fully autonomous.

3.2.3 District Level

The 1995 Constitution and the 1997 Local Government Act mandates the District Local Government to plan, budget and implement health policies and health sector plans. The Local Governments have the responsibility for the delivery of health services, recruitment, deployment, development and management of human resource (HR) for district health services, development and passing of health related by-laws and monitoring of overall district health sector performance. These Local Governments manage public general hospitals and health centres and also provide supervision and monitoring of all health activities (including those in the private sector) in their respective areas of responsibility. The public private partnership at district level is however still weak.

3.2.4 Health sub-district level

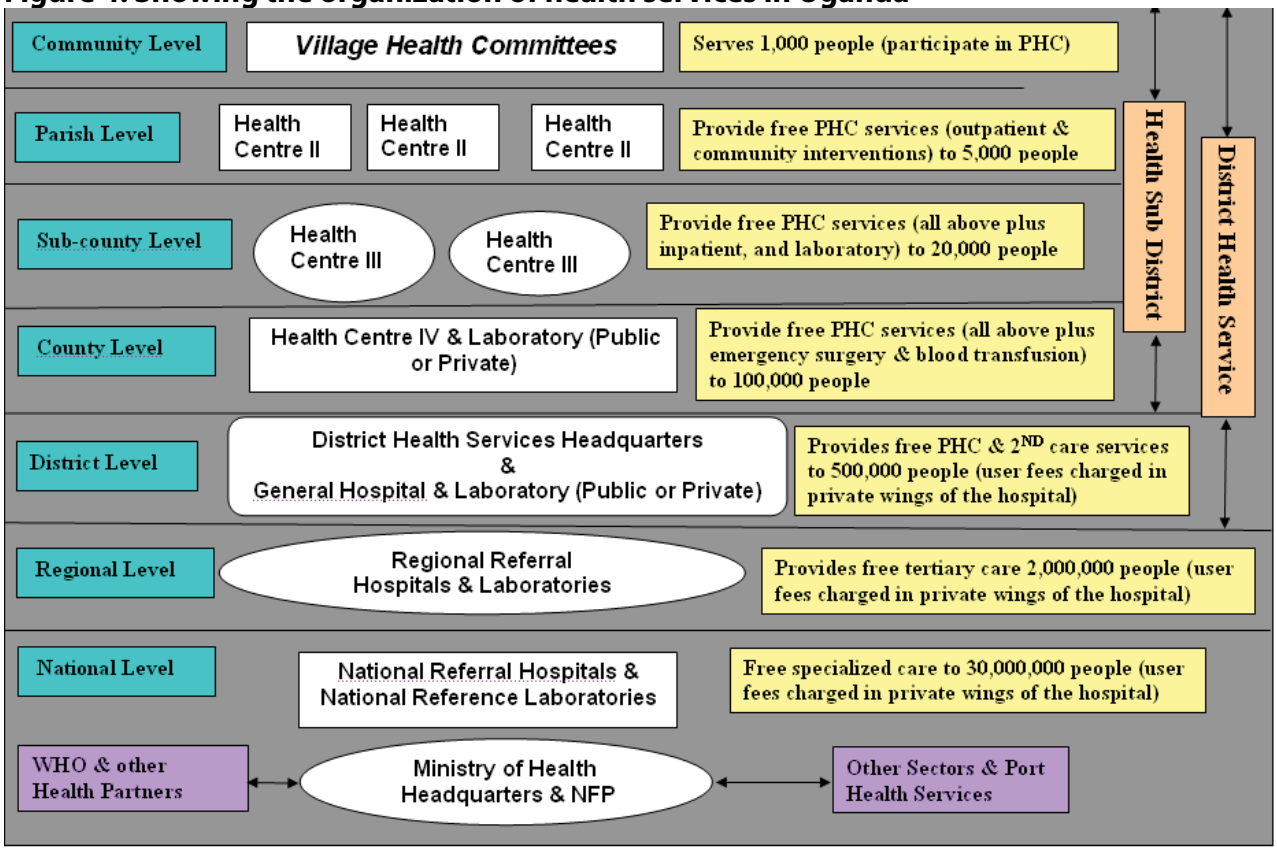
The HSD is a semi-autonomous lower level health zone after the district in the hierarchy of district health services organization. The Health Sub District is mandated with planning, organization, budgeting and management of the health services at this and lower health centre levels. It carries an oversight function of overseeing all curative, preventive, promotive and rehabilitative health activities including those carried out by the PNFP, and PFP service providers in the health sub district;

3.2.5 Health centres III, II and I

HC IIIs provide basic preventive, promotive and curative care and provide support supervision of the community and HC IIs under their jurisdiction. There are provisions for laboratory services for diagnosis, maternity care and first referral cover with inpatient capacity for the sub-county. The HC IIs provide the first level of interaction between the formal health sector and the communities. HC IIs only provide out patient care and community outreach services. An enrolled comprehensive nurse is key to the provision of comprehensive services and linkages with the village health team (VHT). A network of VHTs has been established in Uganda which is facilitating health promotion, service delivery, community participation and empowerment in access to and utilization of health services.

Although VHTs are playing an important role in health care promotion and provision, VHT coverage is still limited. VHTs have been established in 75% of the districts in Uganda but only 31% of the districts have trained VHTs in all the villages. Attrition is quite high among VHTs mainly because of lack of emoluments.

Figure 4: Showing the organization of health services in Uganda



3.3 Organization and Management of the National Malaria Control Program

3.3.1 Evolution of the National Malaria Control Program

In 1995, after recognition of malaria as a major problem, and the need to accelerate efforts to control malaria, a malaria control unit was established, and this has since been transformed into a National Malaria Control Programme under the National Disease Control Department. Malaria control has also been identified as a priority within the Minimum Health Care Package (MHCP) in the National Health policy I and II, the Health Sector Strategic Plans I and II, and in the recently concluded HSSIP. Malaria indicators were included among the core indicators of the HSSP I and II; and are also among the core HSSIP indicators. However, the level of funding of malaria control by the Government has not matched the level of prioritization. Since 2002, with the approval of the GF round 2, malaria control funding has been mainly from GHIs and a few local partners.

With the creation of the NMCP and as the intensity of the work increased, more staff were assigned to the programme. To support coordination and supervision of malaria control activities within the country, the zonal supervision structure was established and district malaria focal persons were appointed in all the districts. However, facilitation of these structures has been inadequate to enable them fulfil their duties and responsibilities.

The private sector contributes significantly to malaria control interventions. To harness their support and contribution to supplement what government and donors are doing, public–private partnerships and coordination mechanisms were established. Private partners and CSOs are involved in different committees and working groups on malaria control.

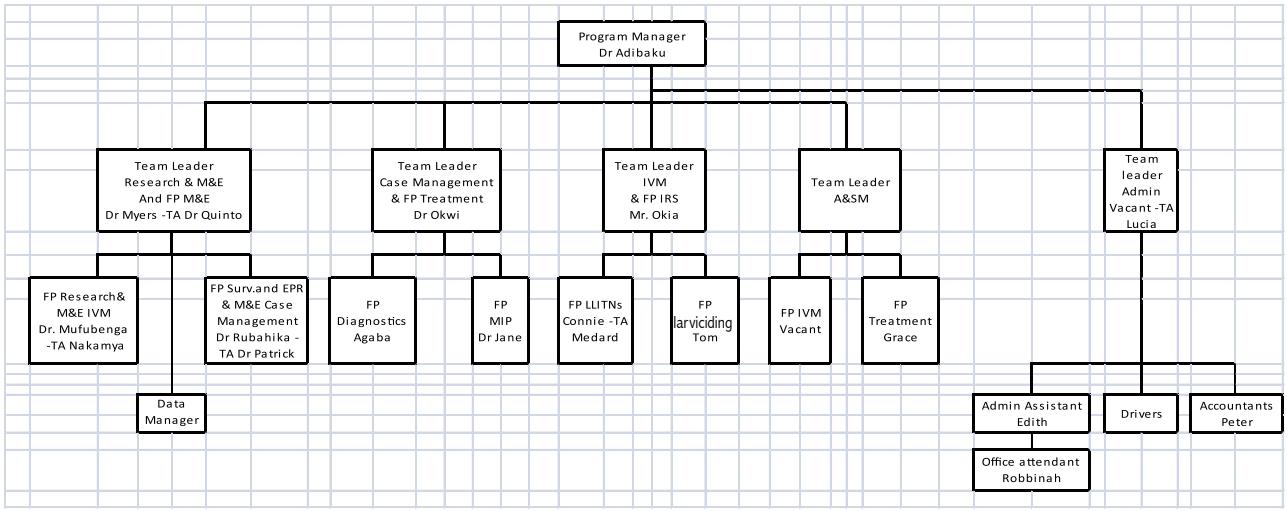
3.3.2 Organization of the National Malaria Control Program

The organization of the NMCP in Uganda is in line with the organization of the Ministry of Health as explained above. In spite of the restructuring of the MoH, the number of staff in the program has remained static since 1998 when it was upgraded from a Unit to a Programme hence some positions remain vacant and this has led to increased workload on the available staff and compromised their effectiveness and efficiency. Over the life of the NMCP frequent changes in the management of the programme and focal persons interrupted continuity and affected the speed and quality of programme implementation. In addition the Global Fund suspension in 2005 led to stalling of interventions such as access to ACTs, the HBMF strategy, and Diagnostics scale up using RDTs.

As of February 2011 the NMCP organogramme is as depicted in Figure 5 below. As shown in the organogramme there is a substantial number of technical assistants who are working in the programme. Although this is not an issue in many other national programmes where such arrangements are used, in Uganda these technical assistants are used as doubles for those holding the actual posts. In essence therefore, the technical assistants end up working like staff of the programme and get engrossed in routine programmatic work that the NMCP staff should have been doing. 11 Zonal Coordinators (mainly from regional referral hospitals) were established in order to improve supervision and planning at regional level. These were initially supported by the District Health Services Project (DHSP). After the project closed, the Zonal Coordinators lacked support until commencement of GFATM Round 2. Following the suspension of the grant, Zonal Coordinators have remained non-functional. An evaluation on Zonal Coordination conducted my Malaria Consortium recommended that the coordinator should be hosted in the community health department of a regional hospital to coordinate all community health activities including malaria. This was piloted in Masaka regional referral hospital and it was recommended that the zonal coordinator structure should be strengthened

At district level, although there is no specific structure for malaria, an officer was delegated as the Malaria Focal Person (MFP). However, due to the reduced size of the DHT, these MFPs often double as focal persons for other programmes.

Figure 5: Current Structure of the NMCP February 2011



With the restructuring districts have transferred most of their roles and responsibilities including focal persons for the various programs to health sub-districts where actual implementation occurs. At health sub-district level the position of Medical Entomological Officer (MEO) was established. Some MEOs are MFPs, others are supporting laboratory services in addition to their routine duties. At facility level the expansion of the staffing structure to include mid wives at HC II has contributed towards an improvement of performance in malaria in pregnancy. The structure also provided for a Health Assistant at HC II, and where they are in place, vector control activities are better supported.

Lastly, community level involvement in malaria control has been a key preventive activity with communities implementing environmental vector control measures. Community involvement was further enhanced with the introduction of Home Based Management of Fever (HBMF) strategy in 2002. Two people per village among the Village Health Teams (VHTs) were trained as Community Medicines Distributors (CMDs) as well as in net distribution and care. In some districts, the CMDs have been trained in net treatment. With the introduction of ICCM the CMDs provide an integrated treatment and care for malaria, pneumonia and diarrhoea for children below five years of age in their villages.

3.3.3 Malaria Control Policies and Guidelines

For the period of this review the main guiding documents on malaria control in Uganda are the just ended Malaria Control Policy 2001/2- 2009/10, the Malaria Control Strategic Plan 2001/2- 2004/05 and the just ended Malaria Control Strategic Plan 2005/6- 2009/10.

For many years malaria treatment in Uganda was presumptive: all fever cases were treated as malaria. In 2009, the NMCP adopted the WHO recommendation to shift from presumptive treatment to parasite based diagnosis using RDTs or microscopy before treatment. In 2000, due to chloroquine resistance Uganda adopted the use of chloroquine and SP (CQ+SP) in combination as first line malaria treatment as an interim policy. The treatment policy was again changed in May 2004 to Artemisinin-based Combination Therapy (ACTs) and Artemether-Lumefantrine (AL) was chosen as first line treatment for un-complicated malaria; artesunate plus amodiaquine as alternate first line and Quinine was recommended as the second-line treatment for un-complicated malaria. The new policy was launched in April 2006 by the Rt. Hon. Prime Minister.

This policy has been reviewed emphasising definitive parasite diagnosis before treatment, with a change from IV quinine to IV artesunate in the treatment of severe malaria and replacing oral quinine with dihydroartemisinin/piperaquine (DP) as second line medicine for un-complicated malaria and use of rectal artesunate for pre-referral treatment of severe malaria. At community level, VHTs have been trained to recognize and refer cases of severe malaria to nearest health facility.

In July 2010 the Ministry of Health adopted a strategy for integrated community case management (ICCM) which will be the mainstay of management of malaria at community level.

The HP&E Division has developed a number of communication strategies for malaria. These include the MOH Communication Strategy for Home-Based Management of Fever[3], Malaria in Children and Control of Malaria in Pregnancy in Uganda, 2001-2005[4], the MOH Communication Strategy for Treatment of Uncomplicated Malaria Using Artemether/ Lumefantrine (AL), August 2004[5], and the 2005 Malaria communication strategy.

Epidemic preparedness and response is part of the Ugandan malaria control strategic plan and its main objective is to predict, detect early and manage malaria outbreaks and epidemics in a timely and cost-effective manner as outlined in the IDSR guidelines. Uganda has an explicit policy on malaria in pregnancy, which is enshrined in the general malaria policy of 1998 and reviewed in 2005 and in 2011. The main strategies identified are use of insecticide treated mosquito nets (ITN); prevention of complications of malaria in pregnancy using intermittent preventive treatment (IPTp); as well as prevention of malaria severity and death using effective treatment.

a) Sector wide approaches (SWAPs)

Uganda's health service delivery (from the public sector point of view) is run by a Sector Wide Approach (SWAP) whose aim is to bring together all partners to common planning, financing and monitoring of health services delivery. Basket funding is implemented by all partners with exception of PMI/USG and GFATM. At the district levels malaria activities are planned and budgeted for in an integrated manner under the leadership of the district medical/health officer.

b) NGO Policy

Uganda has a range of actors in the health sector including national and international non-governmental organizations. To coordinate activities by the NGOs an NGO Policy was developed in 2008 with the broad aim of strengthening the partnership between Government of Uganda and the NGO sector and building capacity and effectiveness in the areas of service delivery, advocacy and empowerment. While the Office of the Prime Minister (OPM) is the Lead Agency for the NGO sector development and oversight, the role of the Ministry of Health, like other line Ministries, include:

i) To strengthen integration of the contribution of the NGO sector in the programs coordinated by Ministry;
ii) To ensure adequate co-operation and coordination is extended to NGO actors at national and local level
iii) To promote and extend technical assistance to NGO actors active in the health sector;
iv) To monitor, evaluate and give an account of the contribution of the NGO sector to the achievement of the objectives of the Ministry.

The key NGOs involved in malaria control are part of the RBM Partnership and are coordinated through the RBM structure at the national level. However, coordination between the Ministry of Health/NMCP and the Office of the Prime Minister (OPM) regarding the technical appropriateness of NGO programmes prior to their registration and operations have been weak. As a result some NGOs operate within the country at national and district levels outside the guidelines of the NMCP.

[3] *Communication strategy for Home based management of fever.*
[4] *Malaria in Children and Control of Malaria in Pregnancy in Uganda, 2001-2005*
[5] *MOH Communication Strategy for Treatment of Uncomplicated Malaria Using Artemether/Lumefantrine (AL), August 2004*

3.4 Partnership in Malaria Control

3.4.1 Malaria management structures

Until 2007, the coordination of malaria stakeholders under the national RBM Partnership was being done using the Inter Agency Coordination Committee on Malaria (ICCM). The ICCM was chaired by the Minister of State for Primary Health Care and consisted of 5 Technical Working Groups (TWGs) namely: Vector Control, Case Management, Malaria in Pregnancy, M&E and IEC. The ICCM functioned well and strengthened coordination of partners with regular meetings of the working groups.

However, due to the presence of several committees, this resulted in too many meetings which were being attended by same groups of patners with a lot of duplication. Hence there was a need to rationalize the Technical Working Groups in order to increase efficiency, effectiveness and coordination. As a result, the ICCM and the five TWGs were disbanded and new TWGs established under the new Long Term Institutional Arrangement (LTIA) under which malaria is coordinated under the Basic Package TWG and particularly under the Communicable Disease Control (CDC) subcommittee. The TWG receives technical presentations from disease programmes during TWG meetings. This arrangement has not solved the challenge of poor partner coordination in malaria control as there remained a multitude of partners planning, delivering and reporting differently, contradicting the "Three Ones" principle. Consequently, an RBM partnership Forum was created whose objectives were to bring together all partners in malaria control to discuss, peer review and reach consensus on malaria related technical issues prior to presentation to the CDC subcommittee and Basic Package TWG; and to plan together and jointly monitor progress and evaluate impact under the "Three Ones".

The RBM Partnership Forum has been operational since its creation although funding for its activities has been weak sometimes. In 2010, the partnership developed an Aide Memoire highlighting the principle of the "Three Ones", the country-wide mapping of partners, creation of a partnership fund and rotational co-chairing and funding of the partnership meetings. Currently, the Stop Malaria Project, funded by PMI, is supporting the RBM quarterly meetings which have improved regularity and timeliness of meetings. However, there is still low participation leading to fragmented planning and implementation, poor reporting and duplication of efforts. Even after development of the Aide Memoire, it has not been fully operationalized and there is no partnership fund resulting in continued weak coordination function of the NMCP.

3.4.2 Malaria Programme Support Structures

The Malaria and Childhood Illness NGO Secretariat (MACIS) was established in 2003 as a network of CSOs engaged in Malaria and Child Health. To date MACIS has a membership of 450 CSOs and has trained all of them in the areas of advocacy for Malaria, as well as monitoring and evaluation. MACIS provides regular technical and policy updates to the members. It has worked with MOH/NMCP to coordinate dialogue with Members of the Social Services Committee of Parliament, with an aim of increasing the oversight role of the Members of Parliament (MPs) for malaria programming and accountability for resources. MACIS also represents the CSOs in technical working groups and HPAC and disseminates the information.

3.4.2.1 Program meetings and reviews

Several meetings take place where malaria is a key issue. These include:

a) The RBM partnership meetings which occur quarterly.
b) The Communicable Diseases sub-committee of the Basic Package Technical working group of the MOH is scheduled to meet regularly; this has not been so over the past eight months, with lack of feedback to the programme when such meetings take place. Departmental meetings are held every month under the chairmanship of the Commissioner National Disease Control.

c) The NMCP working groups meet monthly.
d) Programme staff meetings are held weekly although these have been irregular further affecting coordination within the unit/programme itself.

The meetings have been effective in resource mobilization, information sharing, development of policies and technical guidelines, coordination of events such as the World Malaria Day and workshops to disseminate policies and guidelines. However, many bottlenecks have been identified including late and incomplete reporting, lack of commitment and motivation, external / internal interference with recommendations of technical working groups and flouting of policies and technical guidelines by some sector institutions; for example the decision by National Medical Stores to procure only adult ACT packs, which has affected the proper administration of ACTs under the HBMF strategy, and also the general uptake, compliance/ adherence and ease of dispensing of ACTs.

3.4.2.2 Malaria governance at national and sub national levels

Improvements in the profile and staffing of the programme (from a Unit to a Programme) have improved effectiveness in governance. Policies, strategic plans and guidelines have been developed, and specialized training teams put in place. A performance improvement programme has been started with support from the Capacity Project of Intra Health under PMI funding. However, governance has been affected by frequent changes in leadership, understaffing of the programme, lack of space, procurement and distribution bottlenecks and poor partner coordination in general. At the district level, bottlenecks include inadequate staffing levels, stock outs of medicines and health supplies, and inadequate confirmatory diagnostic services. There is also poor partner coordination at district level resulting in wastage and inefficient use of resources.

3.5 Financing of Malaria Control and Elimination

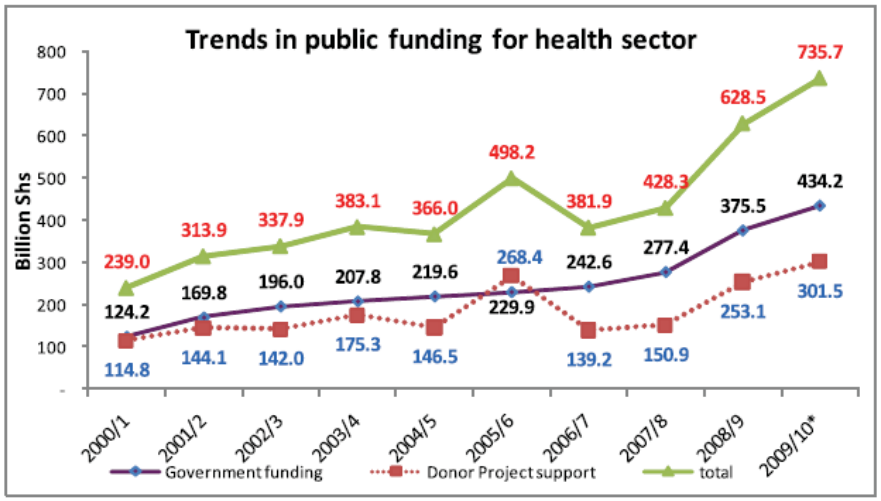
3.5.1 Domestic budget and sources of financing

Table 2: MTEF allocation to the Health Sector from 2000/01-2009/10

Year	GOU	DONOR/ GHI	TOTAL	Per capita expenditure in Ushs	Per capita expenditure in USD	GoU allocation to health as % of total GoU allocation
2000/01	124.23	114.77	239	10,349	5.9	7.5
2001/02	169.79	144.07	313.86	13,128	7.5	8.9
2002/03	195.96	141.96	337.92	13,654	7.3	9.4
2003/04	207.8	175.27	383.07	14,969	7.7	9.6
2004/05	219.56	146.74	366.3	13,843	8	9.7
2005/06	229.86	268.38	498.24	26,935	14.8	8.9
2006/07	242.63	139.23	381.86	13,518	7.8	9.3
2007/08	277.36	141.12	418.48	14,275	8.4	9
2008/09	375.46	253	628.46	20,810	10.4	8.3
2009/10	435.8	301.8	737.6	24,423	11.1	9.6

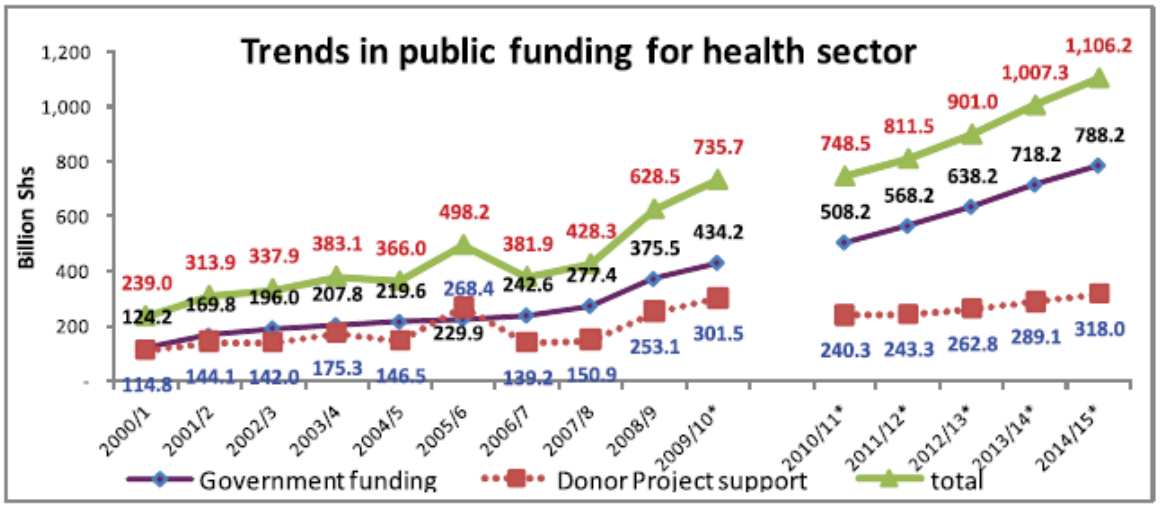
Source: MoFPED approved estimates and Budget performance reports

Figure 6: Past public health financing trends for the health sector



Past public health financing trends for the health sector (Source: HSSIP 2010-2015)

Figure 7: Anticipated Public health financing trends for the health sector



Source: HSSIP 2010-2015

3.5.2 International budget and sources of financing

Table 3: Sources of financing for malaria control

	Amount and Source of funding				
Year	**GFATM**			**PMI**	**Comments**
	Round/Grant	Budget	Actual		
2001					
2002	2 (LLINs Vr. Scheme, HBMF, IRS)	23,211,300	21,054,781		
2003	4 (ACTs, RDTs, HBMF)	137,467,137	82,852,438		GF Rd.4 Transition to AMFm
2004					
2005					

	Amount and Source of funding				
Year	**GFATM**			**PMI**	**Comments**
	Round/Grant	Budget	Actual		
2006				9,500,000	
2007				19,000,000	
2008	7 (LLINs)	125,571,990 Ph.1 51,422,198	Ph. 1 47,282,782	22,000,000	GF Rd.7 Ph.2 reprogramed
2009				21,600,000	
2010	10 (ACTs, RDTs, LLINs)	155,963,673		35,000,000	Rd.10 awaiting signature
2011				35,000,000	Pending availability of funds

3.6 Key Issues and Actions Points

3.6.1 Key Issues

a) The Malaria Policy, Malaria Strategic Plan, Malaria M&E plan ended at the end of 2010 and new ones are not in place.
b) The review found that the NMCP did not produce comprehensive malaria annual work plans for use by the whole partnership
c) Despite the presence of the national RBM partnership, there is still inadequate partner coordination
d) The review noted that within the NMCP there was inadequate team work and personalization of positions and work resulting in personal focus rather than programme focus in conducting certain activities
e) Malaria staff taking a lot of time implementing partners' work instead of their respective mandates that weakens the program
f) Over reliance on technical assistance from partners to implement malaria activities
g) Low position of the NMCP in the MoH structure. The Program Manager is 4 steps below the Technical Head of the Ministry and 5 steps below the Accounting Officer resulting in restricted decision space on all matters including policy, technical direction and resource allocation
h) Interference with and/or flouting of technical guidelines and direction provided by the NMCP
i) Technical assistance from partners is used in the NMCP. However, the technical assistants are used as doubles for the existing posts resulting in the technical assistants taking up most of the workload that goes with routine program work resulting in no transfer of skills as intended.

3.6.2 Action Points

a) Update the national malaria policy, strategic plan and develop joint annual work plans
b) NMCP should conduct joint annual review and planning meetings involving all malaria stakeholders including districts. This meeting can be used as a platform for information sharing by all partners in Uganda.
c) The NMCP and its partners should annually compile an annual report on implementation of malaria control activities in Uganda.
d) Elevate the NMCP to the level of a Department in the MoH where it is able to participate in key policy, technical and resource allocation decisions
e) Revitalize the zonal and district coordination mechanisms to facilitate a more decentralized approach to malaria control

f) The Government of Uganda and partners should commit more resources to malaria control
g) Strengthen the coordination of partners through the RBM partnership forum and Communicable Diseases Control Technical Working Group .
h) The coordination function should be by NMCP (assisted by WHO) and not through projects
i) NMCP should have a fund (Partnership fund) to assist with partner coordination and engagement
j) The MOH should identify and appoint malaria ambassador(s) to advocate for malaria control in the country
k) Sufficient office space should be provided for the NMCP
l) The technical assistants who are housed in the NMCP should be given clear terms of reference which emphasize adding value to the programme rather than just doubling as post holders which ends up not transferring skills at all as initially intended.

4. MALARIA VECTOR CONTROL

4.1 Introduction

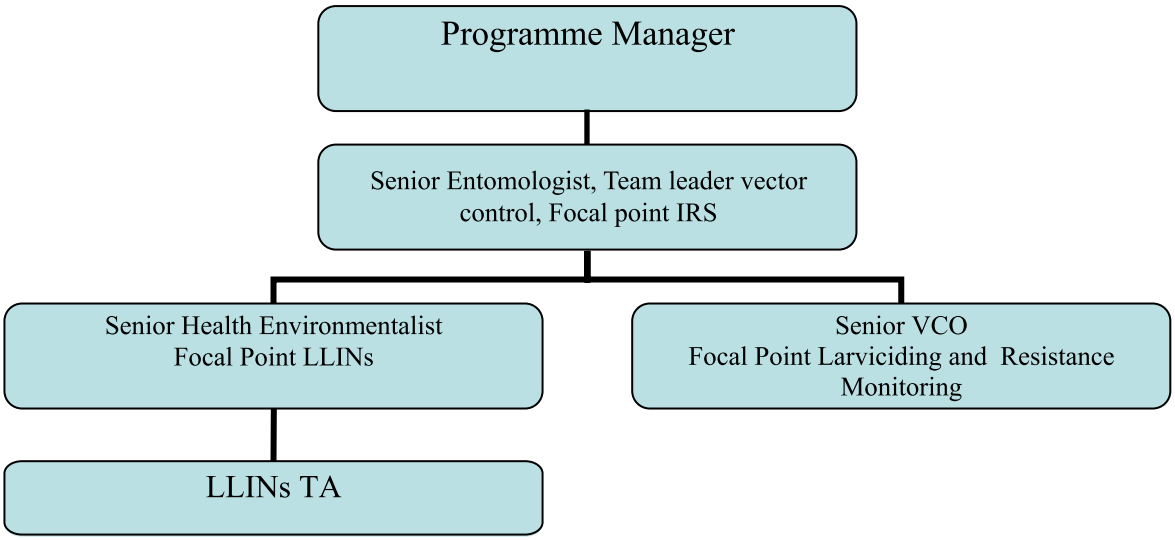
The National Malaria Control Programme (NMCP) is scaling-up both Indoor Residual Spraying (IRS) and use of Long Lasting Insecticidal Nets (LLINs) as priority interventions complimented by larval control measures where appropriate. Available records indicate that IRS in Uganda dates as far back as 1920s. However early IRS trials using DDT in late 1940s to early 1950s in different parts of the country were unsuccessful and abandoned (Garnhami, 1950). A massive IRS exercise using DDT during the Malaria Pilot Eradication Project conducted from 1959-1963 almost resulted in malaria elimination in some areas. *An. funestus* was practically eliminated, while populations of *An. gambiae s.l.* were greatly reduced (de Zulueta et. al., 1960, 1962 and 1964). Between 1997 and 2005, IRS was conducted on an ad hoc basis for the control of malaria epidemics in the highland districts of Uganda. In addition, several institutions such as schools, Tea and Sugar estates, and armed forces barracks have conducted IRS.

The promotion of Insecticide Treated Nets (ITNs) in Uganda started in early 90s before the National Malaria Control Program (NMCP) was established in 1995. This ITN promotion followed the successful efficacy and effectiveness studies on ITNs mainly through support from NGO/CSO projects. Since then, support for ITNs in the country has gradually increased resulting in increasing ITNs coverage rates. The initial drive was on Net retreatment with insecticides until 2006 when the policy changed into use of long lasting insecticidal nets that do not require retreatment. The capacity to distribute and monitor LLIN activities has also been built through training of CSOs and community structures. Coordination mechanisms have also improved although there still remains a number of challenges especially in reporting and maintaining the ITN data base. Major donors for LLINs and their respective implementing partners have been mapped out and there is a system of coordinating them through NMCP.

Larval control in large urban centres in Uganda started with the establishment of a Vector Control Unit (VCU) in the early1940's to control mosquitoes and rodents in Kampala Metropolitan City. From 1950 the number of municipalities increased to 13 and each had a Vector Control unit. The VCUs effectively controlled mosquito breeding sites through larviciding and environmental management methods. The mandate of VCUs emanated from the Public Health Act of 1964. Unfortunately, in spite of the valuable services rendered by these VCUs, they were all disbanded in 1983 due to financial constraints. However, due to public demand for mosquito control services, the VCUs were re-introduced in 2006 in Kampala City Council (KCC) under the management of the Vector Control Division. However, due to inadequate funding, these units have not been able to perform to full capacity.

4.2 Organisational Structure

Figure 8: Organizational structure – vector control



4.3 Vector Control Committee

There is an IRS/LLINs (Vector Control) Committee which includes the MOH, donors, Civil Society Organisations and the private sector which was formed under the Inter-country Coordination Mechanism for Malaria (ICCM).

4.4 Vector Control Human Resources

There are a number of medical entomologists and more than 10 vector control officers (VCOs) at national level and more than 70 VCOs based at the districts, with more VCOs not yet absorbed into the public sector. Most of these are available when called upon to conduct malaria vector control interventions. In addition, all districts have Health Inspectors at District and Health sub District (HSD) levels and Health Assistants deployed at sub-county level in all districts. All these participate in the implementation of vector control interventions.

4.5 Human Resource Training and Capacity Development

There are teams of medical entomologists and vector control Officers (VCOs) and other technicians, both at national and district levels who have been trained in areas of IRS and LLINs programme implementation. For example, a total of 20 national trainers on IRS were trained by WHO in 2009.

At the national level, a senior entomologist is in-charge of malaria vector control activities as well as the focal point for IRS; a Senior Vector Control Officer is a focal point for larviciding while a Senior Environmental Health Officer is the focal point for LLINs and environmental management. Vector control officers (VCOs), Health Inspectors and Health Assistants are available at the district level for implementation of malaria vector control interventions at district and community levels. There is a Vector Control/ITNs Task Force composed of officers from MOH, line departments, development partners, CSOs and the commercial sector.

Pre-service training is conducted at the School of Entomology in vector control including IRS, LLINs, larviciding and environmental management methods. In-service training of field-based VCOs is also organized by the NMCP and the Vector Control Division (VCD) once in a while to update them with the current malaria vector control interventions.

For IRS implementation, the national trainers of trainers (TOTs) train district trainers who in turn train the team leaders, spray operators and wash persons. Storekeepers are trained separately by trained Supplies Officers/Storekeepers, while data entry clerks are trained by Data Managers

4.6 Annual Planning

NMCP together with Abt Associates Inc. the Uganda IRS Project contractor conducts annual planning for IRS for the 10 districts of Northern Uganda. This is then followed by micro planning at the district level before each of the two rounds of IRS is conducted per year.

4.7 Malaria Vectors and their Bionomics

The table below shows the primary and secondary malaria vectors and their bionomics.

Table 7: Primary and Secondary Malaria Vectors and their Bionomics

Malaria vectors and bionomics	Primary vectors: *Anopheles gambiae s.s., An. funestus and An. arabiensis* Secondary vectors: *An. moucheti moucheti, An. bwambae, An. garnhami, An. hancoki, An. obscurus, An. nili, An.stephensi* [6]
Sentinel site for vector bionomics	No sentinel sites currently for studying vector bionomics. Being planned under the Uganda IRS Project supported by PMI.
Breeding habits of primary vectors	Man-made and natural breeding sites with clean and clear stagnant water exposed to sunlight like: pools, ponds, burrow pits (brick/murrum/sand pits), rice-fields, roadside pools, rain water collections, stream/lake sides, river bed pools, seepage water, wells, overhead tanks, channels/canals, hoof prints, car tyre tracks, etc.[7]
Biting and resting habits	Mainly feed on humans (anthropophilic), rest indoors (endophilic) and feed indoors (endophagic), with peak biting activity between 10.00 p.m. and 6.00 a.m.
Indoor resting densities	Densities vary from less than 0.05 female *Anopheles* mosquitoes per house in highland areas to more than 300 *Anopheles* mosquitoes per house[8]
The Entomological Inoculation Rates (EIR)	EIR vary from: <10 in low endemic areas, 10-100 in medium transmission areas, and 393-1564 in highly endemic areas, highest recorded EIR worldwide[10]
Sporozoite rates	Sporozoite rates using salivary gland dissections and ELISA vary from[11]: • 0.8% to 10.3% in *An. gambiae s.l.* and • 1.2% to 4.9% in *An. funestus*
Insecticide Susceptibility	Recent studies on insecticide resistance in Uganda indicate: • High resistance to DDT in most parts of the country • Susceptibility to Pyrethroids is highly variable • High susceptibility to Carbamate and Organophosphate insecticides[6]

[6] *(Gillies & De Mellion, 1968, White, 1973, Townson & Onapa, 1994, Herbch et.al. 1997, Mouchet et.al. 1998, Onapa et.al. (in press))*
[7] *(de Meillon, 1968)*
[8] *NMCP and VCD Reports 2005-2010; Lindblade et.al. 2000a; Kristan et.al. 2008,*
[9] *Lindblade et.al. 1999; Okello et.al. 2006*
[10] *De Zulueta, 1960, Mouchet et.al. 1998; Lindblade et. al. 1999*
[11] *Jo--hn et.al. 2008, Morgan et.al. 2008; Okello et. al. 2006, Okia et.al. 2011, Okia & Protopopoff. 2009; Ramphul et.al. 2009 and Verhaeghen et.al.2010*

4.8 Vector Control Service Delivery

The major vector control interventions are LLINs and indoor residual insecticide spraying (IRS) complemented by larviciding and environmental management where appropriate. Vector Control Policy is covered under the National Malaria Policy (2011), while IRS and LLINs have policy guidelines to guide their implementation. However, there is need to update and consolidate these guidelines into comprehensive Integrated Vector Management (IVM) guidelines.

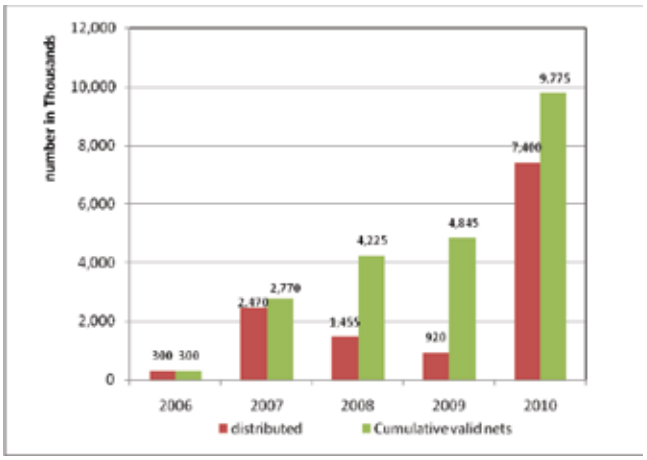
4.9 Long Lasting Insecticidal Nets Specifications and Distribution

ITNs distribution and use in Uganda have been increasing over the years. From 2005 to 2010, rapid scale-up of ITNs distribution activities with funding from UNICEF/JICA, GFATM and PMI was realised. By 2010, MoH had achieved universal coverage in the 3 districts of Western Uganda with support from the Pioneer Project/ Stop Malaria Project, while universal coverage was almost achieved in 5 districts in North Eastern Uganda in 2008/09 with support from UNICEF/JICA. Standards & specifications for Long Lasting insecticidal nets (LLINs) have been developed and disseminated. A national ITN database was established in 2006/7 with PMI/WHO support. Uganda will achieve universal LLINs coverage through procurement and distribution of 17.6 million LLINs under GFATM grant Round 7. Of this, 7.2 million LLINs have already been distributed targeting all the under fives and pregnant women in 70/78 targeted districts

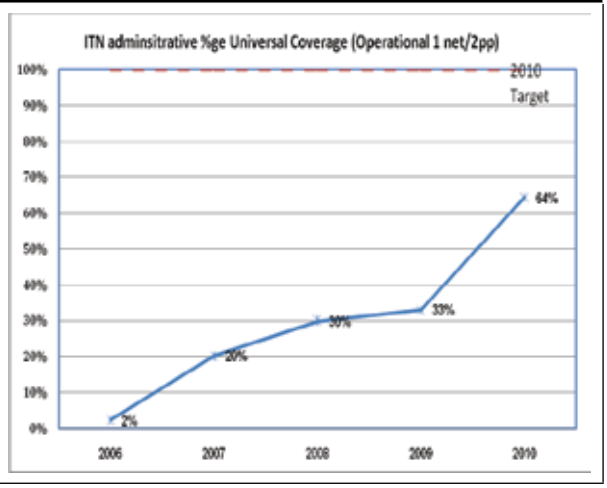
Table 4: LLINs Distribution in Uganda, 2005-2011 (by Government financial years)

	FINANCIAL YEAR (JULY TO JUNE)					
	2005/06	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**
Population	26,574,012	27,477,528	28,411,764	29,377,764	30,376,608	32,939,200
LLINs distributed	300,000	2,470,000	1,454,745	920,000	6,644,000	756,000
Valid Nets Cumulative Freq (3 years)	**300,000**	**2,770,000**	**4,224,745**	**4,844,745**	**9,018,745**	**8,320,000**

Number of ITN distributed and cumulative of valid nets*



Administrative LLIN universal coverage



**Cumulative valid nets (Discounted by ITNS that have lasted more than 3 years)*

While the number of nets distributed went up and down, the cumulative number of valid nets had a fairly smooth rise over the years from 300,000 to 9,775,000 nets in 2010. The steep rise in 2010 was a result of the distribution of the 7.2million nets to pregnant women and under fives resulting in universal coverage rate of 64% of the population.

4.9.1 IRS Achievements

In 2006, IRS on a large scale was re-introduced in Uganda after more than 40 years, in Kabale District. Since then, activities have either been conducted, are underway or are planned in 14 districts. In all the rounds of IRS so far implemented in the different districts since June 2006, the programme has achieved and exceeded its target of more than 85% of the targeted structures sprayed, with high coverage rates of >97% of targeted structures achieved, during all the rounds in the last 1 year. The IRS programme through IEC/ BCC has achieved high community compliance and participation. Although IRS has not been on schedule under GoU funding and under RTI, Abt Associates Inc. has ensured routine and timely IRS every 6 months since November 2009 to date, with more than 2.6 million people protected every 6-8 months in 10 districts. Combining IRS and "mass screening and treatment" of children under 16 years and treatment of adults above 16 years positive for malaria dramatically reduced malaria incidence in Katakwi district in Eastern Uganda.

Figure 12: Map showing districts where IRS has or is being conducted in Uganda

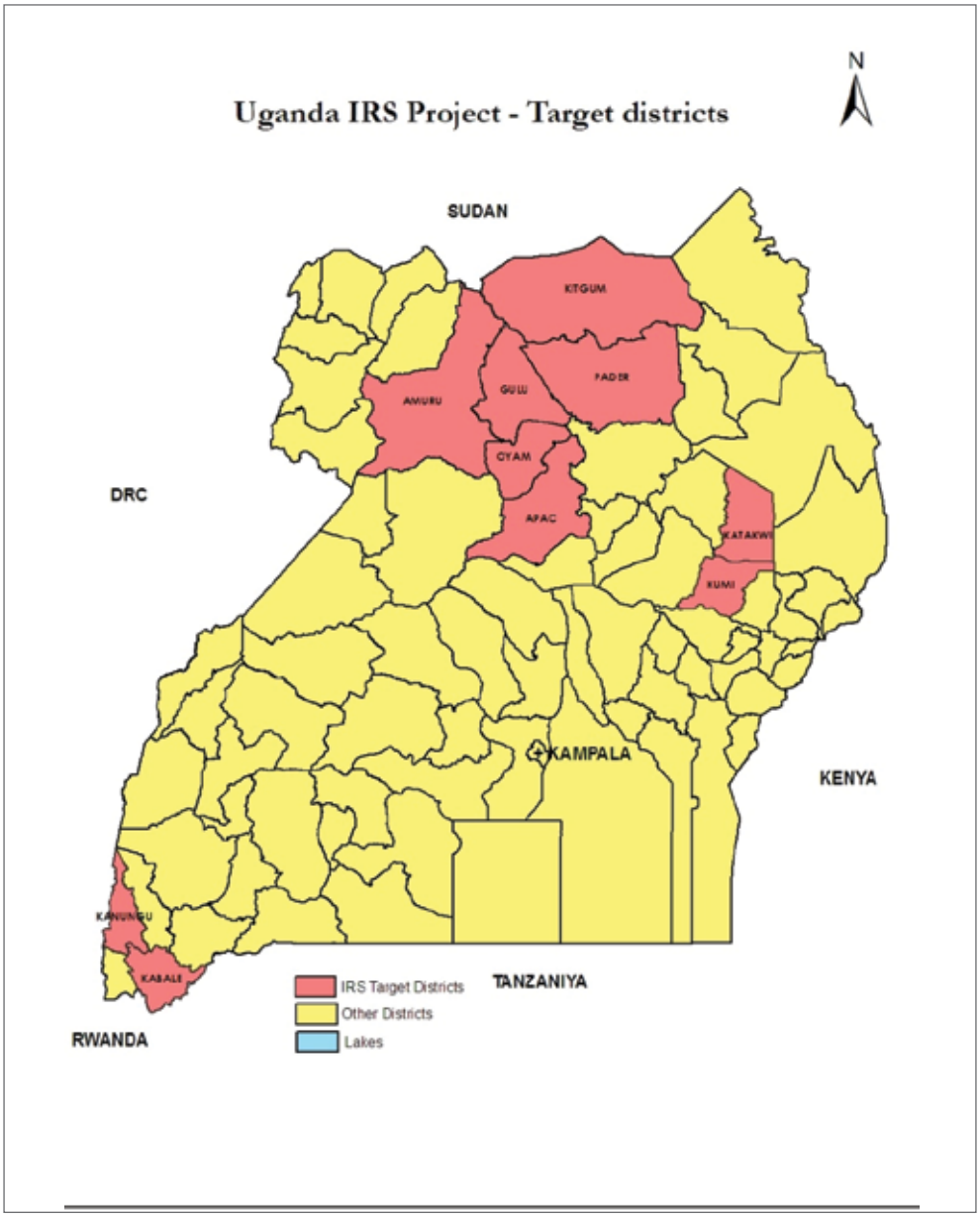


Fig. 5: Percentage House and Population IRS Coverage in 2010

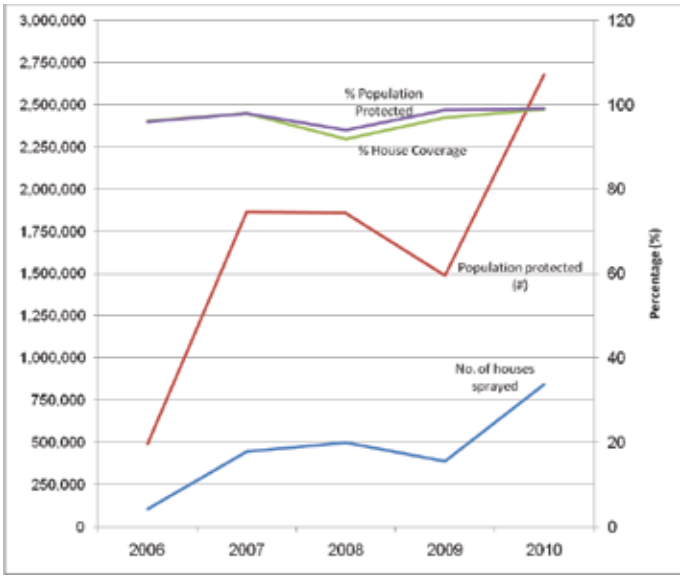
Table 5: IRS Performance in Uganda, 2006-2010

Year	Houses Sprayed	Population Protected	% House Coverage	% Population Protected
2006	103,329	488,502	96.2	96
2007	446,117	1,865,956	98	98
2008	499,998	1,858,149	91.9	94
2009	389,510	1,487,959	97.0	98.8
2010	842,986	2,678,166	98.9	99.1

P/S: Houses and population covered twice in 2010 while in 2009, 284,498 out of 389,510 houses were sprayed while 1,131,289 out of 1,487,959 people were protected in two rounds.

Table 5 and the graph in figure 12 below demonstrate excellent performance in house coverage and population protection in the targeted areas.

Fig 12: Number and proportion of houses Sprayed and Population Protected with IRS 2006-2010



Significant increases in IRS efficiency have also been achieved in 2010 through use of bicycles instead of trucks to reach inaccessible houses given the poor road network which has shortened spray rounds and has also resulted in savings of $2.4 million in 2010. Meanwhile, MOH has also established an entomology laboratory/insectary at VCD with assistance from Vestergaard Frandsen, while another insectary is being established in Gulu University with support from PMI which will help in building entomological capacity in the country for entomological research and monitoring of malaria vector control interventions. Capacity development in IRS implementation has resulted in the following outputs:

- More than 3,900 spray personnel have been trained
- Trained 373 storekeepers on stock keeping and the use of IRS store data tools
- Trained 94 clinical officers on management of insecticide poisoning
- Trained a National Multi-sectoral IRS Monitoring Committee of 17 officers to monitor IRS especially following the re-introduction of DDT for IRS
- Trained a National Team of Trainers of 20 Medical Entomologists, VCOs and other technical staff on IRS for training and research purposes
- Trained District IRS Monitoring Committees in 6 Districts in Northern Uganda.

IRS has achieved good entomological and epidemiological impact on malaria burden in target districts[12], resulting in the reduction of vector indoor resting densities, reduction in clinical malaria cases (OPD attendances and in-patient malaria admissions and a reduction in malaria test positivity rates (HMIS Reports).

Results of bio-efficacy studies on Bendiocarb conducted in six districts of Northern Uganda in 2010 indicated high knock-down (KD) rates and 24-hour mortality showing that the quality of spraying was very good. In addition, the monthly monitoring showed long residual effect over time (80% 24-hour mortality after 4 months).

4.9.2 Larval Control Achievements

Recent trials initiated using larvicides like: Aquatain (an oil film), SAFE, a Sunlight Activated Formulated Plant Extract which kills mosquito larvae, possibly, by radiation, and Bacillus thuringiensis israelensis (Bti) show that they are effective. In 2009, following presentations by manufacturers of the SAFE larvicide, Government allocated Ug. Shs 3 billion for larviciding, with SAFE.

A two-year community-based environmental management (EM) study for malaria control in Kampala and Jinja Cities in 2003-2004 resulted in the reduction of the number of potential breeding sites for anopheline mosquitoes and the numbers of anopheline larval and adult mosquitoes as well as in malaria prevalence of 11% in the Police Barracks (Jinja) and 36% in Kitebi (Kampala)[13].

4.9.3 Key Issues

a) Currently there is limited routine distribution of LLINs to pregnant women and children under 5 through the ANC and EPI services
b) IRS is implemented in only 10 out of 112 districts.
c) IRS and LLINs still remains largely donor dependent
d) Infrastructure for effective and routine entomological monitoring on mosquito bionomics is inadequate
e) There are no policy guidelines for integrated vector management
f) Quality assurance of malaria vector control commodities including spray pumps, public health insecticides and LLINs is limited There is increasing vector resistance to current pyrethroids (currently used both in IRS and LLINs)
g) Universal LLINs coverage not yet attained
h) No on-going IRS activities in most endemic districts and dis-continuation of IRS in epidemic-prone districts
i) No supply of LLINs to hospital wards, boarding schools and institutions

4.9.4 Action Points

a) There is need for a rapid scale-up of vector control activities of LLINs and indoor residual spraying to achieve universal coverage.
b) Strengthen the capacity of the Vector Control Division for malaria vector monitoring and surveillance by establishing and equipping a reference entomological laboratory.
c) Establish representative sentinel sites to monitor vector bionomics including insecticide resistance.
d) Mobilize resources to scale-up IRS to other districts to dramatically reduce malaria transmission and maintain low transmission levels using LLINs.
e) Complete and strengthen the reference entomology laboratory at the Vector Control Division with sufficient equipment to support malaria vector monitoring and surveillance systems.
f) Develop National IVM Policy Guidelines

[12] *Hasifa Bukirwa et.al. 2009, PMI and NMCP reports*
[13] *Lindsay et.al. 2004*

g) Collaborate with NDA/Government Analytical Laboratories and VCD to establish a quality assurance system for malaria VC commodities including spray pumps, public health insecticides and LLINs in Uganda
h) Scale-up LLINs distribution to achieve universal coverage and maintain it through routine distribution of LLINs to pregnant women and children under five. Pro active engagement of WHOPES-approved new and novel technologies before full onset of resistance to pyrethroids
i) Districts to include IRS in their annual plans and IRS to be re-introduced in malaria epidemic prone districts
j) Supply LLINs to hospital wards and boarding schools and institutions
k) Re-establish VCUs in the main urban centres to support malaria control through larviciding, environmental management and enforcement of the Public Health Act

5.0 MALARIA CASE MANAGEMENT

Malaria case management, which includes prompt diagnosis and timely treatment with appropriate, affordable, effective, and safe antimalarials, remains a cornerstone of malaria control in Uganda. The aim of malaria diagnostics is to have all suspected malaria cases subjected to a parasite-based test by Microscopy or RDTs. Timely and accurate laboratory results contribute significantly to the reduction of malaria related morbidity and mortality which is the ultimate goal of case management.

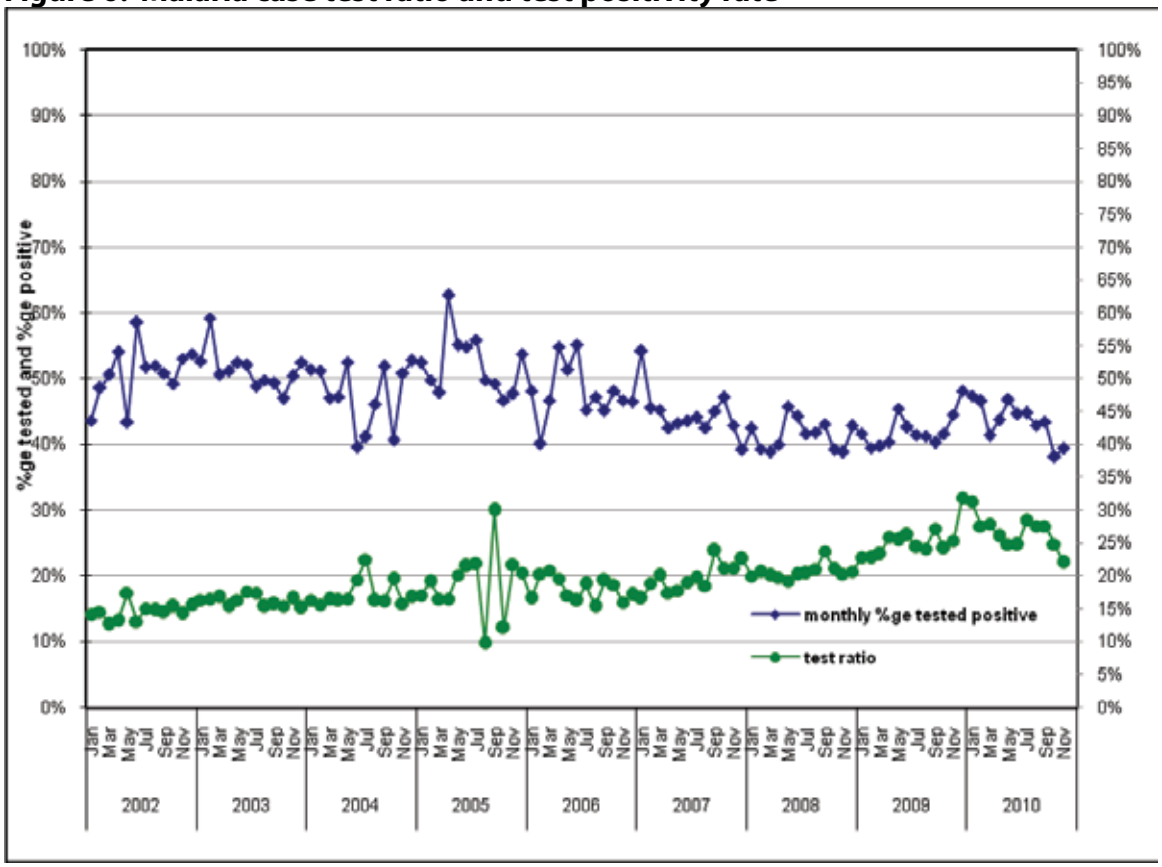
Malaria illness can range from mild disease to a severe life-threatening illness. The mild disease is referred to as "uncomplicated malaria" while the severe life threatening illness is referred to as "severe malaria". Uncomplicated malaria is defined as symptomatic malaria without signs of severity or evidence (clinical or laboratory) of vital organ dysfunction. The first signs and symptoms of uncomplicated malaria are nonspecific. They comprise; headache, lassitude, fatigue, abdominal discomfort, muscle and joint aches, usually followed by fever, chills, perspiration, anorexia, vomiting and worsening malaise.

Severe malaria is malaria usually caused by infection with *Plasmodium falciparum* and is a medical emergency (details of the clinical and laboratory features of severe malaria are found in the Uganda Management of Severe Malaria Guidelines).

5.1 Malaria Diagnostics

The aim of malaria diagnostics is to have all suspected malaria cases subjected to a parasite-based testing by Microcopy or RDTs. Clinical diagnosis has limitations and can lead to misdiagnosis of malaria with resultant mismanagement of non-malarial febrile illness, wastage of antimalarial drugs and potential risk of contributing to the development of resistance. At the inception of the National Malaria Control Program (NMCP) in 1995 through 2002, Malaria diagnosis was based mainly on clinical features. Coverage and utilization of parasite-based diagnosis therefore remained very limited until laboratory services were expanded to the HCIII level as a requirement of the the UNMHCP which includes malaria. . In 2009 the NMCP introduced the use of RDTs to compliment microscopy following the adoption of the WHO recommendation to change from presumptive to parasite based diagnosis. The proportion of suspected malaria cases confirmed by a parasitological test as reported by HMIS currently stands at 24%.

Figure 6: Malaria case test ratio and test positivity rate



5.1.1 Diagnostics Policy and Guidelines

Uganda's malaria Diagnostics policy is to test all suspected malaria cases with Microscopy or RDTs for parasitological confirmation. An implementation plan /guideline has been developed to ensure the effective deployment and rapid scale-up of this policy.

5.1.2 Laboratory infrastructure and human resources

While there were established laboratory staffing norms for the different levels of care, the laboratory workforce was grossly inadequate to meet the required laboratory staffing norms in public health facilities at national and district levels between 1995 and 2004. Initially, laboratory infrastructure only existed at national, regional and district hospitals. However with the operationalisation of the Uganda National Minimum Health Care Package (UNMHCP) in the HSSP I, there was infrastructure development at HCIV and HC111. The output from training schools since 2004 has since grown to about 200 annually due to creation of several private training schools and universities. However, the major problems still remain lack of comprehensive scheme of service, poor working conditions and remuneration to attract the qualified cadres to work at the peripheral health facilities.

The National Malaria Control Program operated for 13 years (1995 – 2008) without a qualified Laboratory Specialist on the team. Since then a Laboratory Specialist is in place in the NMCP and is responsible for strengthening malaria diagnostic services, training, quality assurance, diagnostics supplies management and keeping track of malaria diagnostics activities.

5.1.3 Organisation, Planning and Implementation

Uganda has a national laboratory network comprised of:

a) **At central level:** The National Malaria Control Program and Central Public Health Laboratories play an apex role and provide the stewardship that includes planning, coordination, supervision, quality

assurance and resource mobilization. This level also links with the WHO and a multitude of malaria diagnostics partners.

b) **At regional level:** There are regional Laboratory coordinators stationed at the regional referral hospital laboratories that provide technical support to the districts within their catchment areas. While this level provides an opportunity to improve laboratory diagnostic linkages, it is presently not fully functional due to inadequate facilitation and well defined scope of work.

c) **At district level:** There is a district laboratory focal person (DLFP) in every district who provides technical supportive supervision for the peripheral HCIV and HCIII laboratories.

d) **At community level:** Uganda adopted the ICCM model that includes the use of RDTs as one of its components. Trained VHT members will be supplied RDTs from the nearest health facility that will also be responsible for supportive supervision, quality assuarance and ensuring safe waste disposal practices.

5.1.4 Training and Capacity Development

An important component to strengthening malaria diagnostics program is training of health workers on both RDTs and microscopy. There was no organized national malaria diagnostics training until 2007 when there was increase in partner support for diagnostics. There is a national standard curriculum for microscopy and RDT training used for diagnostics trainings.

5-2 Achievements

5.2.1 Malaria Microscopy

The Ministry of Health, through the Malaria Control Program with support from partners (PMI and SMP/Jump/UMSP is strengthening capacity for malaria microcopy in 26 districts: Soroti, Bukedea, Kayunga, Mukono,Wakiso, Rakai, Sembabule Mityana, Mpigi, Luwero, Nakasongola, Nakaseke, Kiboga, Kibaale, Buliisa, Masindi, Tororo, Iganga, Jinja, Masindi, Kabale, Kangungu, Mbarara, Bushenyi, Bundibugyo, Kabarole, and Mubende. The district capacity building is through the training of pool district trainers who in turn train the other health workers in collaboration with the implementing partners. The central team provides an oversight role in implementation of the training.

5.2.2 Malaria RDTs

The implementation of malaria diagnosis by the use of RDTs in Uganda started in 2007 when pilot studies were conducted in five districts that generated evidence on which full scale implementation is being based. In 2009 the GFTATM funded Uganda to implement RDTs in 21 districts. A national ToT for RDT was conducted in which 20 national RDT trainers were trained for rolling out the national program. Scale up of the training exercise started in 2010 as part of the national RDT roll-out plan with cascade training by the national trainers training 170 district trainers in 17 districts who will then train 4,547 health facility personnel in the respective districts. However, although this training has been ongoing for now close to two years, RDT stock-outs have hampered scaling up and to date the testing rate still remains as low as 24%.

5.2.3 Supply Chain Management and Logistics

- **Quantification of Diagnostics: Morbidity – Consumption Methods**

Quantification of malaria diagnostic supplies is based on the number of suspected malaria cases. Currently there is no systematic approach to collect actual facility consumption data for RDTs and Microscopy reagents. Reliance on morbidity data has made forecasting and prevention of stock outs difficult. Frequent stock-outs and sometimes mismatch of reagents combination for malaria microscopy delivered at the

health facilities, poor supplies tracking and storage facilities greatly contributed to the low performance in malaria microscopy targets.

- **Quality Assurance of Malaria Diagnostics**

Implementation of a good quality assurance program is critical for a well functioning national malaria diagnostics program. Prior to 2008, there was no well established Quality Assurance Management System for malaria diagnosis. However, since 2009, the Ministry of Health through the MCP, has made significant progress in implementing quality assurance programs for both microscopy and RDTs. During this period two parallel quality assessment schemes for malaria microscopy have been implemented in two health regions of Soroti and Hoima. The programme has not yet been rolled out to a nationwide scale.

Malaria microscopy external quality assessment (slide re-checking) has been implemented in 5 districts of Mid-western Uganda (Hoima, Masindi, Buliisa, Kibaale, Kiboga) region. The scheme recruited 50 laboratories (4 hospitals, 9 HCIV, 37 HC111) to participate.

Currently, the quality assurance system for RDTs is under development with two models being proposed; one involving the use of microscopically confirmed known blood samples as standards to control RDTs on site and the second involving comparison of RDTs against blood smears. For the mean time, national recommendations of lot testing, storage and transportation under cool chain are being practiced. Lot testing is done at WHO accredited Laboratories. The cool chain is maintained at the National Medical Stores and during transportation. Monitoring the performance and potency of the RDT testing devices at health facilities and follow up of health workers to assess competency in performing quality RDT testing after the initial training are also done.

Table 7: Indicators for malaria diagnosis

No	Description of Indicator	Target	Achieved
1.	Proportion of malaria cases with confirmed diagnosis by Microscopy or RDTs	85% by 2015	24%
2.	Proportion of the districts with at least 80% of targeted HWs trained on RDT	100%	22.8%
3.	Proportion of the districts with at least 80% of targeted Lab technicians trained on Malaria Microscopy	100%	38.3%
4.	Number of health facilities participating in malaria slide rechecking (EQA)	200 by 2015	60

5.3 Treatment of Malaria cases

5.3.1 Malaria case management policy and guidelines

For a long time the mainstay of treatment in the country was chloroquine (CQ). However, due to chloroquine resistance, an interim policy change was adopted at the end of 2000 that recommended the use of chloroquine and SP (CQ+SP) in combination as first line malaria treatment. Treatment guidelines and communication materials were updated, and health staff in the public sector trained on the new treatment policy.

The treatment policy was again revised in May 2004 to Artemisinin based Combination Therapy (ACTs) due to increasing resistance to CQ/SP. Artemether-Lumefantrine (AL) was chosen as first line treatment for un-complicated malaria; Artesunate + Amodiaquine as alternate first line and quinine was recommended as

the second-line treatment for un-complicated malaria (NMCP treatment policy, 2005). MoH sought funding for ACTs through a GFATM grant (Round 4). However, in 2005 the Global Fund suspended grants to Uganda; leading to a prolonged period of stock outs of ACTs in the country.

This treatment policy is still in use but has recently been reviewed in line with recent WHO guidelines (WHO treatment guidelines, 2010 updated April 2011). The new National Malaria Control Policy emphases parasite based diagnosis before treatment, change from IV quinine to IV artesunate in the treatment of severe malaria, replacing oral quinine with Dihydroartemisinin/Piperaquine (DP) as second line medicine for un-complicated malaria and use of rectal Artesunate for pre-referral treatment of severe malaria. At community level, VHT members have been trained to recognize and refer cases of severe malaria to the nearest health facility.

5.3.2 Management of Uncomplicated Malaria

Treatment guidelines and training curricula have been developed and health workers trained on case management by MOH and partners. Although partners have trained a number of health workers, this data has not been aggregated at NMCP.

a. Home based management of fever (HBMF)

Home-based management of fever (HBMF) for children less than 5 years of age was introduced in 10 districts in 2002 through distribution of pre-packaged drugs (a locally manufactured combination of CQ and SP called Homapak) at community level. Between 2003 and early 2005 this programme had been rolled out to cover all districts in the country. In line with the malaria treatment policy, the Ministry of Health in 2006 replaced Homapak® with ACTs in 40 out of 80 old districts. There has been piece meal implementation of HBMF with ACTs and has never had a countrywide scale up. Due to inadequate supply of ACTs, the actual treatment of malaria at community level stalled. With recent funding from GFATM Round 4 phase 2 (October 2010) training on implementation of HBMF using ACTs has been rolled out to 39 more districts.

b. Integrated Community Case Management (ICCM)

Building on the success of the HBMF strategy and in order to facilitate access to and reduce treatment gap for malaria, pneumonia and diarrhoea, the Ministry of Health together with development partners in July 2010 adopted a strategy for Integrated Community Case Management (ICCM) for these diseases.

5.3.4 Severe malaria

Severe malaria is usually managed at the higher levels of the health system where there are necessary staff, logistics and supplies (HC IV and above). The current recommended treatment for severe malaria in Uganda is intravenous quinine followed by ACTs as soon as the patient is stable and able to take orally. Quinine will be replaced by artesunate once the updated policy is approved. Although management of severe malaria is done at higher levels of care (HC IV and hospitals), the first point of contact for some of the severe malaria cases is the HC II and HC III. These facilities provide pre-referral treatment with IM quinine before they refer to HC IV and hospital. Similarly, as indicated above, IM quinine will be replaced with rectal artesunate when the new policy is approved. Adjunct therapy for severe malaria includes IV fluids, 50% Dextrose and blood transfusion.

5.3.4 Infrastructure and organization of malaria case management services

There is a national to village level structure for malaria case management (national referral hospital, regional referral hospitals, district general hospitals, HC IV, HC III, HC II, HC I). HC I is the lowest level of care at community level that provides health services through volunteers who are organized in "village health teams" (VHT) responsible for a village. Each VHT is composed of 5 to 7 VHT members. This structure has

been in existence since 1999 when the first national health policy was put in place. A senior medical officer at NMCP is a focal point person (coordinator) for malaria case management, Laboratory diagnosis and MIP. In his capacity he also serves as the secretary to the case management working group which is responsible for malaria treatment policy formulation and provision of oversight to its (policy) implementation in the country.

Within the district, the District Health Officer (DHO) assisted by the Malaria Focal Person (MFP) is in charge of all malaria control services including case management. HC II and HC III run by nurses typically provide outpatient and referral services while hospitals and HC IVs run by specialists, medical officers and clinical officers provide inpatient services. In 2005, the NMCP designated specialists working in regional referral hospitals as zonal malaria coordinators in order to improve case management services and facilitate the interaction between districts, health facilities and NMCP. This tier of malaria supervision and coordination has however not been functional since their establishment following the suspension of GF in 2005 under which the zonal coordinators were supposed to be facilitated.
Under HBMF and ICCM the VHTs (HC I) refer patients to the nearest health facility, replenish their supplies and submit monthly reports. Health workers at this level are required to supervise activities of VHT members. Although traditional and complementary medicine health practitioners provide treatment to a sizable number of clients, their role and mandate in the treatment of malaria has yet to be streamlined.

5.4 Achievements

The annual health sector performance report 2009/2010 analyzed progress on HSSP II targets for malaria which showed that the proportion of children under five getting correct treatment within 24 hours of onset of symptoms and health facilities without any stock-outs of first line anti-malaria medicines fell below the targets for 5 consecutive years. However, there has been progressive decline of case fatality rate from 4% in 2005 to 1.4% in 2010.

5.4.1 Uncomplicated malaria

Treatment guidelines and training curricula have been developed and health workers trained on case management by MOH and partners. Although partners have trained a number of health workers, this data has not been aggregated at NMCP.

Availability and proper use of the recommended drugs at all facilities countrywide has proven to be a challenge. A survey done in four districts in 2008 revealed that there were often stock-outs of the recommended drugs (13% of the facilities reported complete lack of AL in the past 2 weeks), and even when drugs were present, clinicians prescribed non-approved therapies, including CQ, SP and CQ+SP in 18% of patients (Zurovac et al, 2008). The 2009 UMIS reported that among children under five years with fever, 60% took an anti-malarial medicine, and of these, only 23% took an ACT. A pilot project to deliver subsidized medicines in the private sector was conducted in 2008. This pilot, supported by the Medicines for Malaria Venture (MMV), demonstrated that providing subsidized ACTs through the private sector can lead to a dramatic improvement in the availability (~70% market share) and the level of uptake of effective treatments (CAPSS pilot study).

5.4.2 Severe malaria

In the past couple of years, several activities have been undertaken to enhance effective management of severe malaria, including: the use of artesunate suppositories administered close-to-home under ICCM; revision of the training manual for severe malaria; as well as efforts to make relevant supplies available at referral health facilities.

Clinical audits have been used to improve operational efficiency and quality in the management of severe malaria in 23 (now 34) pilot districts, and there are plans to scale up this approach to cover the entire country under GF round 10. In 2010, NMCP with support from SMP trained 3,576 health workers in 23 (now 34) districts at hospitals and HC IVs in severe malaria management and at HC III and HC II in pre-referral management of severe malaria with IM quinine. However, parenteral quinine has not been part of the Essential Medicines List of Uganda (EMLU) provided to HC II. Challenges to management of severe malaria include: lack of medicines, supplies, laboratory facilities and human resources, weak referral systems, sub-optimal patient evaluation, low coverage of laboratory based diagnosis, and limited supportive therapy.

5.4.3 HBMF and ICCM

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. A number of surveys and evaluations have been carried out to assess the performance and impact of the HBMF programme[14]. Results indicate that compliance with 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%) was observed, particularly among younger children (less than 2 years).

The major challenges in the implementation of the HBMF include: sustaining the motivation of the volunteers through an equitable provision of incentives; supervision, data flow and utilization and supply chain management through the supporting health facilities which often is hindered by insufficient operational funds and human resources; ability of VHTs to handle multiple medicines and supplies (ORS, antibiotics, antimalarials, zinc, rectal artesunate, RDTs etc).

5.4.4 Human resources, training and capacity development

There has been a general shortage in the number and mix of health workers required to deliver the Uganda minimum health care package which includes malaria case management. A recent review in 2008 indicated that about 48% of local government posts and 74% of posts at regional referral hospitals were filled (MOH, 2008). Malaria is often managed by nursing assistants especially at the lower level health facilities. At HC II and HC III 66% of patients were receiving care from a nursing assistant while at hospitals and HC IVs, 28% of the health workers managing severe malaria were nursing assistants (Achan et al 2011). However, trainings in malaria case management have so far targeted mostly qualified staff and not nursing assistants, and have also not covered the entire country. Training approach has been competence based using the cascade model with emphasis on skills and practice rather than theory. In the cascade training, there is an existing pool of national trainers who train a team of district trainers. The district trainers in turn train the health workers at the health facilities. The national pool of trainers however, needs to be expanded in number so as to be able to handle the expanded number of districts.

5.4.5 Essential medicines and health supplies

The medicines for malaria treatment are specified in the Essential Medicines List of Uganda (EMLU) which is regularly updated in line with the malaria treatment policy.

5.4.6 Estimates and quantification of requirements

The method used in quantification of medicines for management of malaria in Uganda is the morbidity method due to; insufficient consumption data on ACTs and other medicines for management of malaria at both central and health facility level.

[14] *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*

5.4.7 Storage and Distribution

The NMS procures stores and distributes medicines and health commodities for public facilities, while Joint Medical Stores (JMSS) procures and stores for Private Not For Profit (PNFP) facilities but does not do distribution. NMS operates both a pull and push supply system. In the Push supply system, defined quantities of EMHS are included in a kit for HC II and HC III facilities. In the Pull system, HC IVs and hospitals are required to determine their requirements and place orders to NMS according to a pre-determined schedule. In both cases, the quantities of antimalarial medicines supplied are determined by amount of funds set in the Credit Line for each health facility under Vote 116 by MoH/MoFPED. This vote is controlled by NMS.

NMS distributes commodities including antimalarial medicines and supplies to health facilities every two months. Deliveries are made directly to all hospitals and HCIVs, and to districts for HCIIs and HCIIIs. In the latter case, there are district stores for storage of commodities in transit to the lower level health facilities. NMS is expected to commence distribution of EMHS up to the health facilities

5.4.8 Quality Control of Commodities

Quality control of malaria commodities is done through the NDA which ensures GoU procurements are restricted to suppliers registered in Uganda as well as National Drug Authority (NDA). The NDA also conducts GMP inspections and maintains a register showing the registration status & name of manufacturer and suppliers. This register is continuously updated and restricts the malaria commodities that can be imported into the country. In addition NDA conducts post-marketing surveillance of all malaria commodities and the national pharmacovigilance centre monitors adverse events due to ACTs.

5.4.9 Advocacy, information, education, communication and community involvement in malaria case management

Community knowledge about malaria treatment is high but many patients still seek treatment late. Studies done in the country show that a significant proportion of the population first seeks treatment elsewhere before presenting to the health facilities. Self medication is also still widely practiced. Informal reports indicate that some communities still demand for inferior medicines including CQ+SP for treatment of malaria. Supervision reports from NMCP show that there is overuse and inappropriate dosing of quinine in the treatment of malaria.

Behaviour change communication messages and IEC for malaria case management have focused on early treatment seeking, completing treatment schedules and adapting behaviour to prevent future malaria attacks. These messages are integrated in treatment services at all levels including the VHTs. At health facility level health workers were trained on counseling skills as part of malaria case management with emphasis on interpersonal communication between the HW and patient. Health facilities have also been provided with tailored messages in form of flip charts, brochures and posters to sustain information dissemination. Mass media including Radio and TV have been the main channels used to communicate malaria treatment messages. Partners have used community dialogue meetings as a way of effectively engaging the communities in malaria prevention and control.

5.4.10 Financing malaria case management from domestic and foreign sources

Financing for case management activities just like all malaria control services is mainly by the Global Fund and partners, with very minimal allocation from the government of Uganda. Within NMCP budget, there is no specific budget line for diagnosis and case management (ministerial budget policy statements, 2000-2010). Over dependence on partner support sometimes constrains planning and implementation of malaria control activities. For instance when GF support was suspended in 2005, the country experienced a prolonged stock out of ACTs.

5.4.11 Drug Efficacy Monitoring

The Uganda Malaria Surveillance Project (UMSP) manages 6 sentinel sites at HC IVs located around the country. The sites were selected based on historical entomological and epidemiological data. They include; two sites with relatively low transmission intensity, (Kamwezi and Kihihi), two with medium transmission intensity (Walukuba and Kasambya) and two with high transmission intensity (Nagongera and Aduku). The sentinel sites collect high quality malaria data, which is analyzed to produce monthly reports. These reports aim to give an overview of the malaria situation in the different parts of the country where the sentinel sites are located.

UMSP has recently expanded its surveillance activities to include inpatient surveillance at hospitals to monitor trends in severe malaria morbidity and mortality in the districts where outpatient sentinel sites are located. Currently the active sites are Jinja, Tororo and Kambuga hospitals and is expected that all six sites will be fully functional by the end of 2011. The sentinel sites collect blood samples which are used by the national molecular biology laboratory to monitor resistance to antimalaria medicines and to conduct drug efficacy studies.

5.5 Key Issues

a) There are frequent stock-outs of antimalarial medicines and supplies at health facilities and community level.
b) Although the NMCP has conducted training of health workers in 21 districts on the use of RDTs, its implementation is hampered by non availability of RDTs.
c) Integrating private sector providers into national case management programme remains a challenge.
d) There are weak services for management of severe malaria below HCIV level.
e) Poor laboratory personnel staffing at all levels
f) Inadequate technical supportive supervision to service delivery points
g) Obsolete equipment (microscopes)
h) Inadequate linkages with the Regional and District Laboratory focal persons
i) Lack of a malaria reference Lab facility (the TB and AIDS programs have reference lab facilities)
j) Inadequate staffing numbers, knowledge, skills and attitudes
k) Piecemeal and fragmented implementation of activities in the era of universal coverage (e.g. HBMF, amidst weak facility systems)
l) Lack of adequate collaborative mechanism with private facilities (PF)
m) Inadequate job aids and guidelines in the health facilities

5.6 Action Points

a) Support rapid nationwide scale up of case management (diagnostics and medicines) including at the community and private sector levels.
b) Use consumption data to strengthen quantification of malaria commodities.
c) Review the policy guidelines on the management of severe malaria below HCIV level and improve the referral system
d) Need to set up strong linkages with the National Medical Stores management and involve the NMCP in monthly meetings with NMS
e) Develop linkages with HR and HSC to improve on the laboratory personnel recruitment and retention at all levels

f) Replace monocular microscopes with binocular ones and repair non - functional equipment.
g) Establish a malaria reference laboratory facility
h) Conduct country wide training on logistics management with emphasis on quantification and timely ordering
i) Strengthen the quantification of malaria commodities (RDTs and medicines)
j) Improve skills of available health workers through training, regular supervision, mentoring, and motivation.
k) Develop/update, print and distribute key job aids and guidelines
l) Strengthen pre-referral management of severe malaria at HC IIIs and HC IIs

6.0 MALARIA PREVENTION AND TREATMENT IN PREGNANCY

Although there are no nation-wide figures, isolated studies show that the risk of malaria parasitemia in pregnant women can be as high as 62.1%, associated with maternal anaemia and peri-natal mortality[15]. However, the majority of pregnant mothers in malaria endemic areas are asymptomatic (occult), with or without positive peripheral blood smears while still posing danger to both the expectant mother and her unborn child. Uganda has an explicit policy on malaria in pregnancy (included in the general malaria policy) developed in 1998 and subsequently reviewed in 2005 and in 2011.

6.1 Organization of the Malaria in Pregnancy Services

Implementation of the malaria in pregnancy control strategy was relayed through the existing health care delivery structures from the national level through to the community level allowing easy access to the target groups (pregnant women) and acceptance of the intervention.

At the national level the program is coordinated by the Reproductive Health (RH) division, with technical back up from the National Malaria Control Program (NMCP). Further, program planning, coordination, capacity building, supervision and monitoring are done at regional, district and health sub district levels by the corresponding Maternal and Child Health Coordinators and Focal Point Officers, in collaboration with malaria focal persons at those levels. At facility level, an integrated approach is used to increase synergies. At community level, malaria in pregnancy services are relayed through community resource persons such as village health teams, religious leaders and other opinion leaders.

6.2 Implementation Process of the Malaria in Pregnancy Strategy

The implementation of the MIP strategy marked a turning point with the introduction of IPT and ITNs interventions in ANC. This followed a strategic plan that was designed in 2001, and reviewed in 2005. Implementation took on activities such as baseline surveys; implementation guidelines formulation and dissemination; partnership building; sensitization of district leaderships; training of health workers; commodity procurement and distribution; advocacy and social mobilisation; monitoring and supervision, as well as quality improvement and operational research.

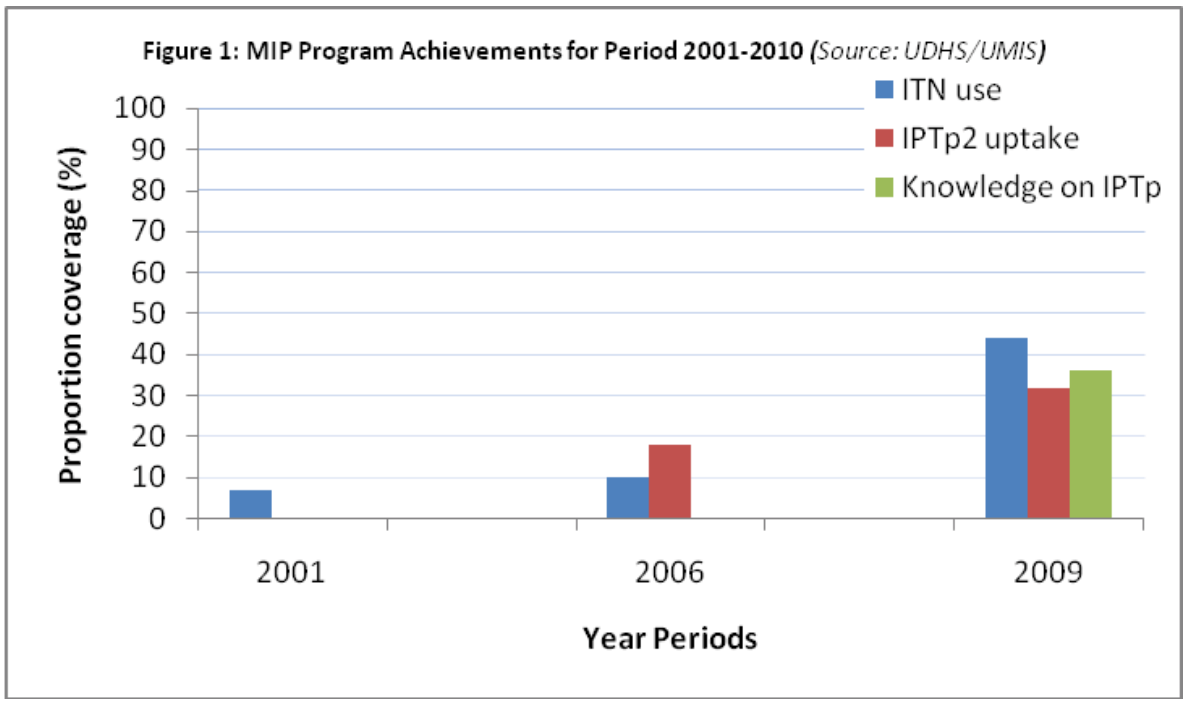
6.3 Program Achievements

Although there were no adequate process and output data to directly measure activity performance of different actors, community surveys have demonstrated progressive achievements of the MIP program in

[15] *Ndyomugyenyi R. Mugnussen P. Anaemia in pregnancy. Plasmodium falciparum infection as an important cause in primigravidae in Hoima district. Western Uganda. Ann Trop Med & Parasitology 1999: 93 (5): 457 – 465*

terms of IPTp - SP uptake, ITN use, and correct knowledge on IPTp among pregnant women. As illustrated in Fig 1, the proportion of pregnant women that sleep under ITNs rose from 7% in 2001 (UDHS) to 10% in 2006 (UDHS); and to 44% in 2009 (UMIS). The proportion of pregnant women that take at least 2 doses of IPTp-SP rose from 0 in 2001 (UDHS) to 18% in 2006 (UDHS); and to 32% in 2009 (UMIS). The correct knowledge on IPTp-SP among pregnant women rose from 0 in 2001 (UDHS) to 36% 2009 (UMIS).

Figure 17: MIP achievements 2001-2010 (Source: UDHS/UMIS)



6.4 Best practices and lessons learnt

The review identified several best practices including the following:

a) Implementation of MIP strategy through existing health care delivery structures does not only ease access to target groups (pregnant women), but promotes rapid expansion of the program, forges structural sustainability, minimises cost of operation, and promotes quick acceptance of the new intervention as part of the old ANC package. On the other hand, implementing the MIP program through the existing structures strengthens the systems and makes existing ANC package more attractive and more relevant to the target groups

b) Implementation of IPTp-DOTs is possible even in resource constrained situations where staff can improvise without compromising quality of services e.g. use of clean plastic medicine containers in lieu of conventional drinking cups.

6.5 Key issues

a) Routine distribution of ITNs through ANC remains limited

b) Poor coordination between the Reproductive Health Division and NMCP has hampered progress in the implementation of malaria in pregnancy activities

c) Stock outs, and/or the non-stocking of SP in ANC services even when available in health facilities has also hindered the implementation of IPT

d) There is continued poor monitoring and non-documentation of the malaria in pregnancy activities

e) There is persistent low MIP program coverage due to limited funding and restricted MIP activities

to the public sector, leaving a sizable private sector that is moderately utilized by the target groups

f) There is poor quality of ANC-MIP services at health facilities e.g. non implementation of DOTs owing to inadequate commodities, equipment, supplies, clean water, service providers and support supervision.

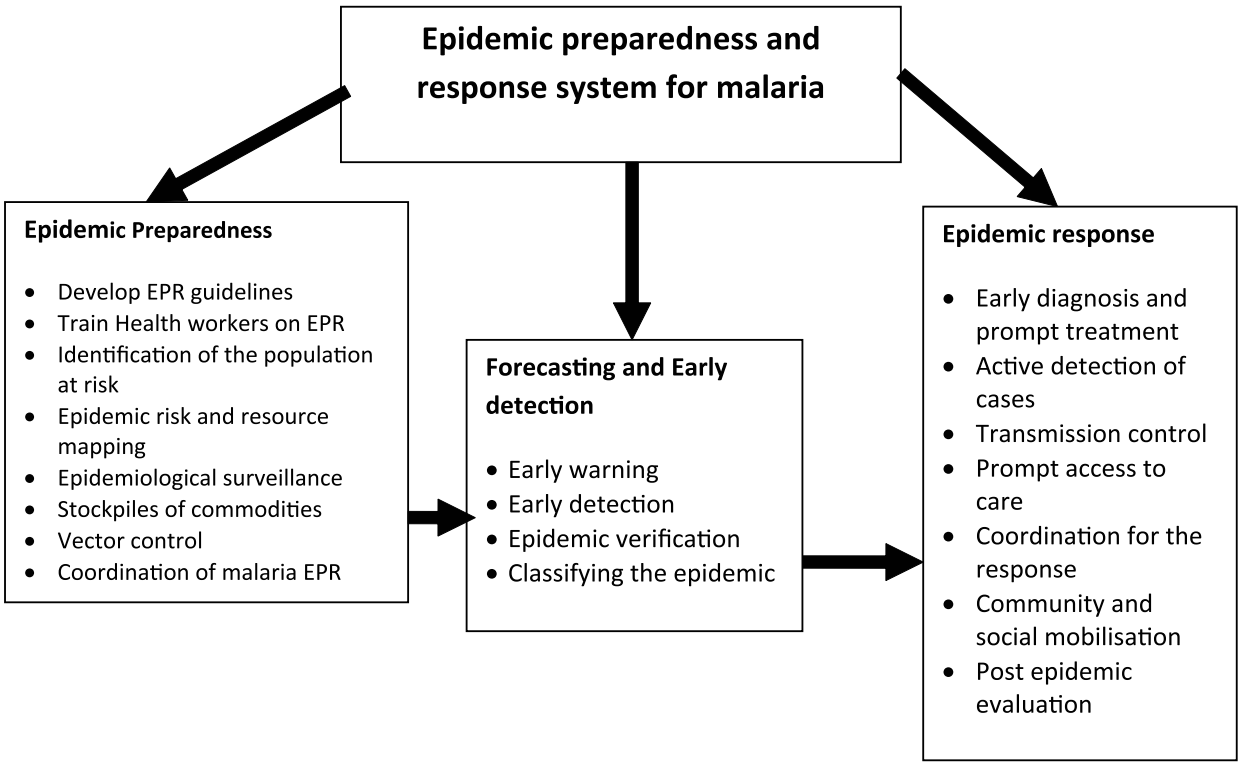
6.6 Action Points

a) RH should take a key leadership role in MiP with NMCP providing technical support.
b) Ensure the availability of malaria in pregnancy commodities and strengthen health referral systems.
c) Scale up routine ITN distribution to all pregnant women through the ANC services.
d) Revitalize the country RBM Malaria in Pregnancy subcommittee to streamline the leadership of MIP program and the roles of different stakeholders at various levels
e) Improving support supervision of MIP activities, as well as mentoring implementers at different levels of care for improved quality of care

7.0 EPIDEMIC PREPAREDNESS AND RESPONSE

The National system for malaria epidemic preparedness and response is in place and has its components as depicted in figure 3. This system is structured in levels right from ministry to district and health unit levels for direct development and implementation of malaria EPR plans. However, the community system is not yet developed.

Figure 18: Components of Malaria EPR system



7.1 Preparedness

Populations at high risk have been identified and malaria epidemic prone areas mapped and stratified as high, medium or low risk including improvement to some extent of the disease surveillance system. The Health Mapper soft ware for updates of the mapped malaria prone areas is currently lacking in all epidemic prone districts. Though the centre often responds in provision of drugs and supplies, there has been no buffer at districts specifically for malaria epidemics during malaria transmission season. Districts often lack contingency plans for EPR as a result of constricted budgets.

There is a national epidemic task force to handle all diseases of epidemic potential including malaria. It is headed by the Director of Health Services (Community and Clinical Services) and all programme managers and focal persons for EPR are members of the task force. The technical epidemic task forces at district and lower levels although in place, are not fully operational due to lack of resources.

Integrated IDSR guidelines for all diseases exist but there was a need for a focused guide for malaria. This necessitated development of malaria specific guidelines for use at national, district and health unit level. Consequently, with support from PMI, this guide was developed in 2009 and it is due for printing and circulation. This document contains plans of resource mobilization, forecasting, detection, monitoring and response interventions

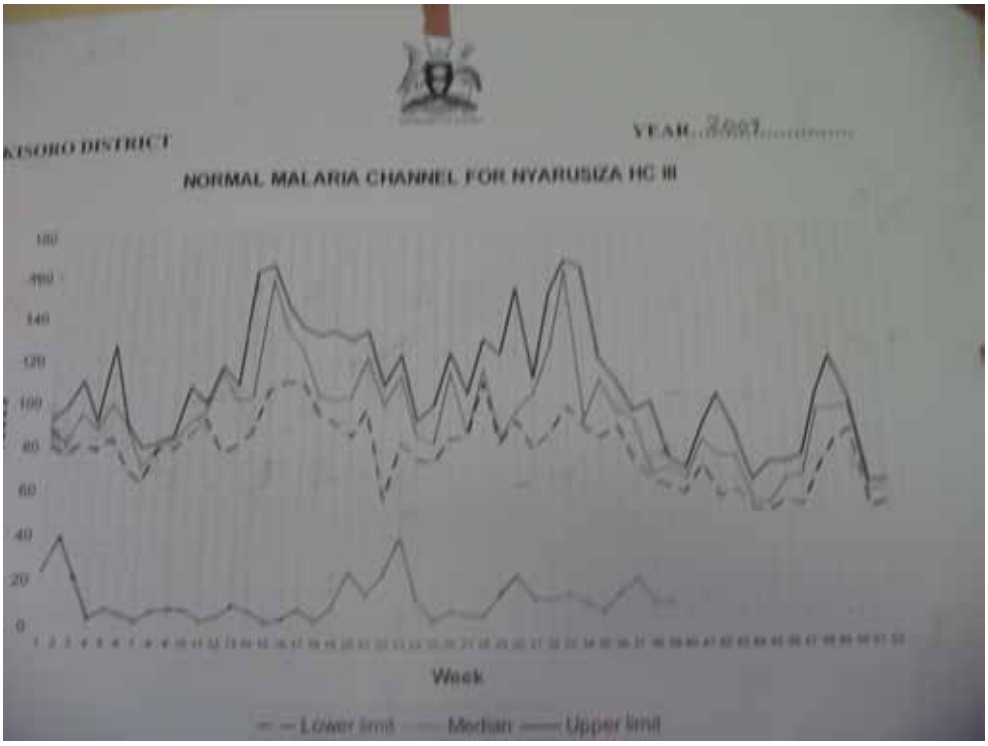
7.2 Early Detection and Response

Forecasting as well as early detection of malaria epidemics helps in minimising case fatality rates since resources, facilities and personnel are mobilised in advance .The following methods have been in use:

a) There is an established weekly malaria surveillance system using data generated from all health facilities in the country. The datasets are aggregated at the district level for onward transmission to the central level (resource centre). The main challenges include inadequate analysis and use of this data at point of collection (the health facility level) and lack of equipment/computers, capacity gaps of staff, and lack of internet services (modems).

b) Training on the use of malaria "normal channel" graphs and setting thresh holds has been done in majority of the epidemic prone districts but the challenge has been that these graphs increasingly become less sensitive in detecting epidemics because they were/are constructed using all cases (clinical and laboratory confirmed); with the current plan of rolling out and use of diagnostics, the confirmed cases cannot be meaningfully compared. (See figure 4).

Figure 19: A normal channel chart at Nyarisiza HC III in Kisoro District after introduction of RDTs to all health facilities showing monitored weekly cases far below the normal trends



c) Epidemic prone districts are supposed to gazette specific health facilities to act as sentinel sites for quality and timely malaria data collection. However, not all districts have gazetted them and where it has been done, there is a challenge of functionality due limited supplies and human resource. There is a malaria sentinel site in each of the districts of Kabale and Kanungu supported by UMSP. These sites

give quality and timely data. The challenge is that they are few in number hence not representative.

d) The highland Malaria (HIMAL) project which had boosted surveillance in highlands from 2003 closed in 2006. Associated with this project were components of epidemiology, entomology and meteorology. All of which contributed to early prediction and detection of epidemics.

e) In collaboration with the meteorology department, NMCP tested the KEMRI climate based malaria prediction model in Kabale District. The model has capabilities of predicting malaria epidemic in 2- 4 months in advance using temperature and rainfall data. Other requirements for the model to function are presence of weather observation sites which must be situated within 60 km radius of a health facility[16] (Giertho 2007-2010). Currently, there are only 12 functional synoptic (observation every 3 hours) weather stations country wide. However, only 2 out of 15 epidemic prone districts (Kabale & Kasese) have these stations which also do not adequately cover all the health facilities in those districts. Other challenges for non functionality of the existing health facilities that fall within the catchments of those weather stations include capacity gaps of health workers and lack of guidelines/manuals.

f) The Department of Meteorology is important in forecasting malaria epidemics and upsurges hence need for collaboration with NMCP; however this collaboration has been weak. The technical expertise of the department is significant in revamping or installing weather observing sites on malaria mapped highland prone districts in order to improve capabilities of the highland prediction model as it works better with meteorological datasets emanating from observing sites less than 60km from the health facility.

7.3 Epidemic Investigation and Response

There are integrated EPR task forces at the district level chaired by RDCs as well as Rapid Response Teams (RRTS) at all districts. However, training in malaria specific EPR has taken place in 8 out of 15 malaria epidemic prone districts. The EPR committees at national and district levels are responsible for coordination of the emergency response to disease epidemics. Even where there are RRTs, there is a delay in confirmation and response to epidemics due to lack of drugs, rapid diagnostic tests, and commodities for vector control i.e. IRS insecticides and LLINs.

EPR activities are funded by the government of Uganda and partners. Districts too are supposed to plan for EPR under their district annual work plans and funded by primary health care (PHC) but occasionally this is not followed. Since 2008, EPR activities at NMCP level have been supported through a collaboration between PMI and WHO. From 2008 to date, the funding has been as follows: 2008 (75,000 USD), 2009 (150,000 USD), 2010 (0 USD), 2011 (100,000 USD). But this funding is inadequate to cover all district activities.

7.4 Achievements

a) Guidelines on epidemic preparedness and response were developed in 2009

b) Training of health workers in epidemic early detection using health facility specific normal channels started in 2008-2009. Under PMI funding, MOH and WHO carried out training on EPR in epidemic prone districts of Kabale, Kisoro, Bushenyi, Kasese, Kapchorwa, Bukwo, Mbale, Bundibugyo, Kanungu, Kisoro, Rukungiri.

c) Early 2011, malaria focal persons were trained in malaria epidemic prediction model which works on the principles of increase in rainfall and temperature. The malaria epidemic prediction model was developed by KEMRI using climatic factors and sentinel health facility data

[16] *Transferring the malaria epidemic prediction model to end users in East Africa (Andrew K. Githeko 2007-2010*

7.4.1 Key Issues

a) Delayed approval of malaria EPR guidelines
b) No comprehensive malaria EPR plans
c) The current malaria epidemic threshold values are based on the clinical diagnosis of malaria. There is the need to review and update these thresholds to take into account the introduction of malaria diagnostics
d) No buffer stocks of drugs and supplies for EPR
e) Inadequate funds to appropriately respond to epidemics
f) District EPR plans not available in some districts
g) Lack of diagnostics at health units results in an unreliable malaria normal channel
h) Ina adequate integration of malaria EPR and IDSR at all levels

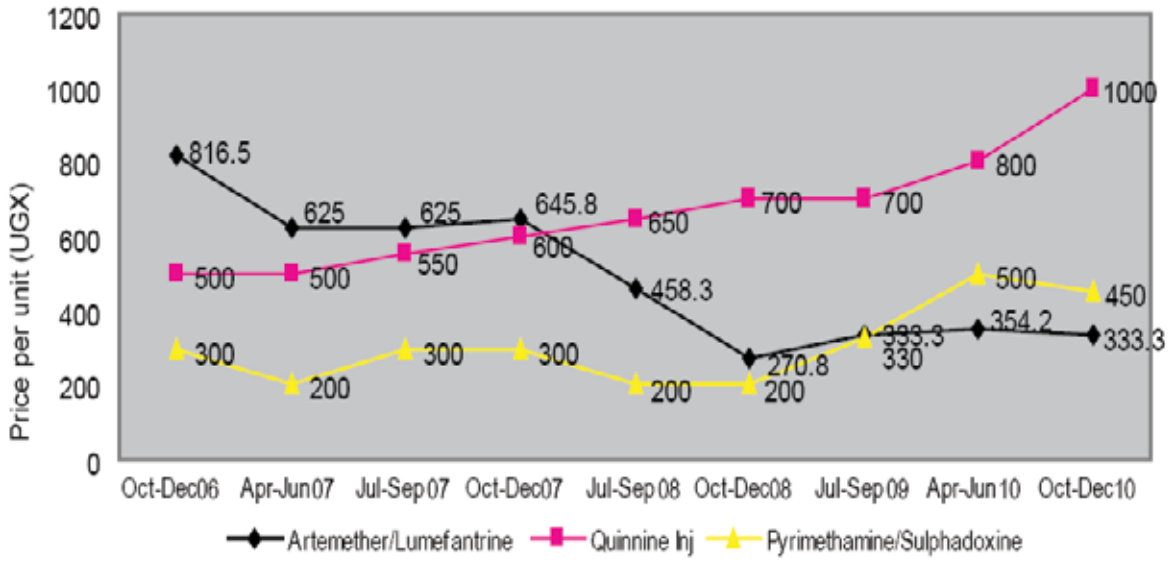
7.4.2 Action Points

a) Develop national and district EPR plans
b) Finalize the approval of the EPR guidelines and training modules and disseminate them
c) Revise malaria epidemic thresholds.
d) There is need for increased collaboration of meteorological department with the malaria control programme
e) Customise and implement use of KEMRI malaria epidemic model
f) Plan for buffer stocks (drugs and IRS supplies) for malaria epidemic outbreaks preferably at district level
g) Integrate malaria EPR with the Integrated disease surveillance and response (IDSR)

8.0 MALARIA COMMODITIES PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

An effective procurement and supply management system is key for NMCP achievements at all levels of health care. Availability of EMHS including anti-malarials at the health facilities is a key indicator for quality health services delivery. Since 2002, systems have been put in place to support PSM including among others, establishment of the Division of Pharmaceuticals Services, Technical Working Group for EMHS, National Medical Stores (NMS) since 1993, Joint Medical Stores (JMS), Uganda National Bureau of Standards (UNBS) for quality tests of Long Lasting Insecticidal Nets (LLINs) and National Drug Authority (NDA) since 1993. Several development partners such as UNICEF, RBM, MSH, WHO, Malaria Consortium, IRC and Stop Malaria are involved in PSM activities. The program has received support from GFATM since 2002. Harmonization of inputs by partners is done using the *3 year rolling procurement plan for EMHS, 2007*. The PSM of EMHS at health facility level has changed over the review period from push to pull (2003) and to push (2009) for HCII and III. Support is provided to PNFP facilities through JMS with 20% of 3rd party commodities including anti-malarials. All 3rd party commodities including ACT's are free to Public, PNFP & Private facilities. Primary Health Care (PHC) funds (50% for lower level facilities and 40% for hospitals has been available over the review period to support procurement of EMHS *(district PHC financial disbursements, 2000-2008)*. Since 2009, all Government resources for procurement of EMHS have been consolidated under vote 116 at NMS. Malaria commodities are available in the private sector but access is limited by high prices *(medicines price monitor MoH, WHO, HAI, 2010)*.

Figure 20: Price trends of key antimalarial medicines in the private sector 2006-2010



CAPSS model (2007) provided evidence that a well planned subsidy leads to increased access to ACT's in the private sector. The current Affordable Medicines Facility-malaria (AMFm) concept is based on the CAPSS model and was launched on 29th April 2011with a mechanism to extend the subsidized ACT's to the private sector

8.1 Specification of commodities

Policies and guidelines for management of malaria outline the commodities used over the review period including CQ, SP, Homapak, ACTs, Quinine injection and tablets among others *(Malaria Control Policy, 1998, 2001 & draft version 2011)*. The draft policy will also address substitution of injection quinine with intravenous artesunate in management of severe Malaria. The Essential Medicines List of Uganda (EMLU) 2007 details the specifications of EMHS and includes malaria commodities. The list is currently under review and laboratory commodities have also been suggested for inclusion. Specifications for EMHS are emphasized during bid preparations.

Table 8: NMCP commodities, specifications and level of use

COMMODITIES	SPECIFICATIONS	FORMULATION	USE
Artemether +Lumefatrine	Artemether 20 mg and Lumefantrine 120 mg	Fixed-dose combination	1st line treatment of uncomplicated malaria
Dihydroartemisinin /Piperaquine	Dihydroartemisinin40mg & Piperaquine 320mg	Fixed-dose combination	Alternative first-line treatment
Artesunate+Amodiaquine	Artesunate 50mg + Amodiaquine 153mg base	Co- blister Tablets	
Chloroquine	Chloroquine 150mg base	Tablets	Reserved for prophylaxis in sicklers
Sulphadoxine – Pyrimethamine (SP)	Sulphadoxine 500mg & Pyrimethamine 25mg	Fixed-dose combination	IPT in pregnant women
Quinine	Quinine as a sulphate 300 mg	Tablets	2nd line oral treatment/ in severe malaria
Injection Quinine	600 mg/2 ml as a dihydrochloride	Ampoules	2nd line treatment in severe malaria
Injection Arthemether	80mg/ml	Ampoules	Alternative Second line in severe malaria
Injection Artesunate	60mg/ml	Ampoules	1st line treatment of severe malaria
Rectal Artesunate	50mg, 100mg & 200mg	Suppositories	For pre-referral in severe malaria
Rapid Diagnostic Test (RDTs)			For quick diagnosis of the malaria parasites
IRS(Commodities)			
LLINs			Prevention of mosquito bite

8.2 Estimates and quantification of requirements

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

Morbidity Method

The method has been applied with modifications by various international partners to estimate and quantify commodities.

For Malaria Medicines,

Total number of treatments needed = Average drug treatment schedule × Number of treatment episodes

Average treatment schedule for malaria products

The medicines dosage is calculated using the Uganda standard treatment guidelines for malaria.

$$Q_E = BU \times N_D \times L_D$$

Where: Q_E is Quantity of each medicine needed for each treatment episode, BU is Basic units per dose or average dose, N_D is Number of doses per day and L_D = Length of treatment in days

For Rapid Diagnostic Tests (RDTs)

Total number of RDTs needed = (Total Number of episodes of malaria at HCII +60% of cases at HCIII) x Projected coverage factor

Consumption Method

This method has been used by some international partners supporting the NMCP. The method reviews issue data at the NMS, stock on hand and in pipeline.

Current situation

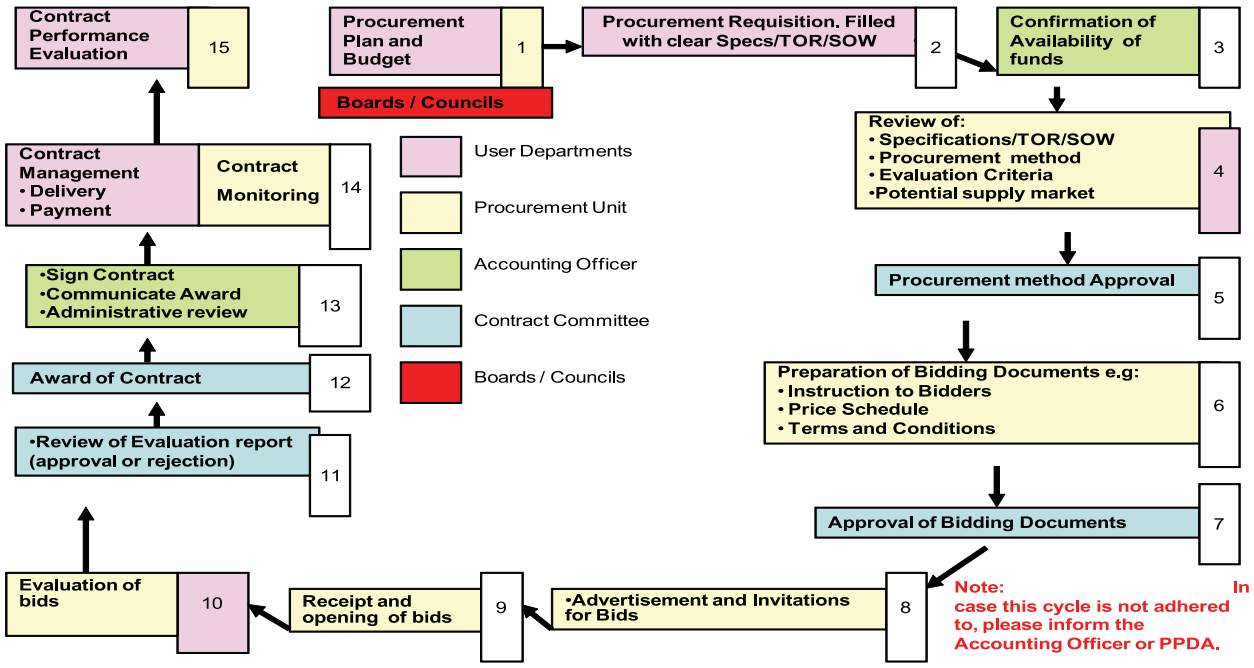
Quantification of malaria commodities is done yearly at the national level and the obtained figures are provided to the NMS for initiation of subsequent procurements *(NMCP, PD, DP, Districts). However, there is* no evidence of the NMCP quarterly and annual implementation and strategic plans, therefore no evidence of inclusion of this data

8.3 Financing

GoU has the mandate to finance EMHS for the public sector according to the EMLU. Support from development partners has been received from DANIDA funding to PNFP HFs through JMS between 1986 – 2010, MAP project between 1999-2004, GFATM since 2003, UNICEF and DFID. Additional GOU funding was provided after suspension of the Global Fund in 2005 amounting to 60bn UGX for ARVs and ACT's in equal amounts of 30bn.

8.4 Procurement

Procurement is guided by PPDA Act 2003, currently undergoing review, whose major objective is to promote value for money and efficiency in procurement, while ensuring that public procurement is conducted in a fair, transparent and non-discriminatory manner. The system also ensures that emergency procurement can only happen with a strong justification. International agencies that have supported procurement include;- Crown Agents for Global Fund, and DELIVER for PMI, MOH develops annual and quarterly work plans with Budgets and Procurement plans with involvement of relevant stake holders and end users for ease of implementation.



Produced by Public Procurement and Disposal of Public Assets Authority (PPDA), 1 Pilkington Road, Workers' House 14th Floor, P.O Box 3925, Kampala, Email; info@ppda.go.ug. Tel. 041- 311100

8.5 Procurement system

There is a procurement system in place at both central and local government levels. At each central and local government unit there is a Procurement and Disposal Unit (PDU) responsible for procurement functions of the unit. The procurement unit compiles the annual and quarterly procurement plans based on submissions received from the user departments. Procurement is initiated by the user department making a procurement request to the PDU. The PDU then determines the best method of procurement and in most cases makes submissions to the Contracts Committee after a report is received from an evaluation committee constituted to evaluate specific procurements. The Contracts Committee makes the decision to award a procurement contract based on their independent assessment of the report of the evaluation committee. Following the award, a contract is signed by the Accounting Officer and the remaining procurement process up to delivery of the procured works, goods or services is managed by the PDU together with the user department.

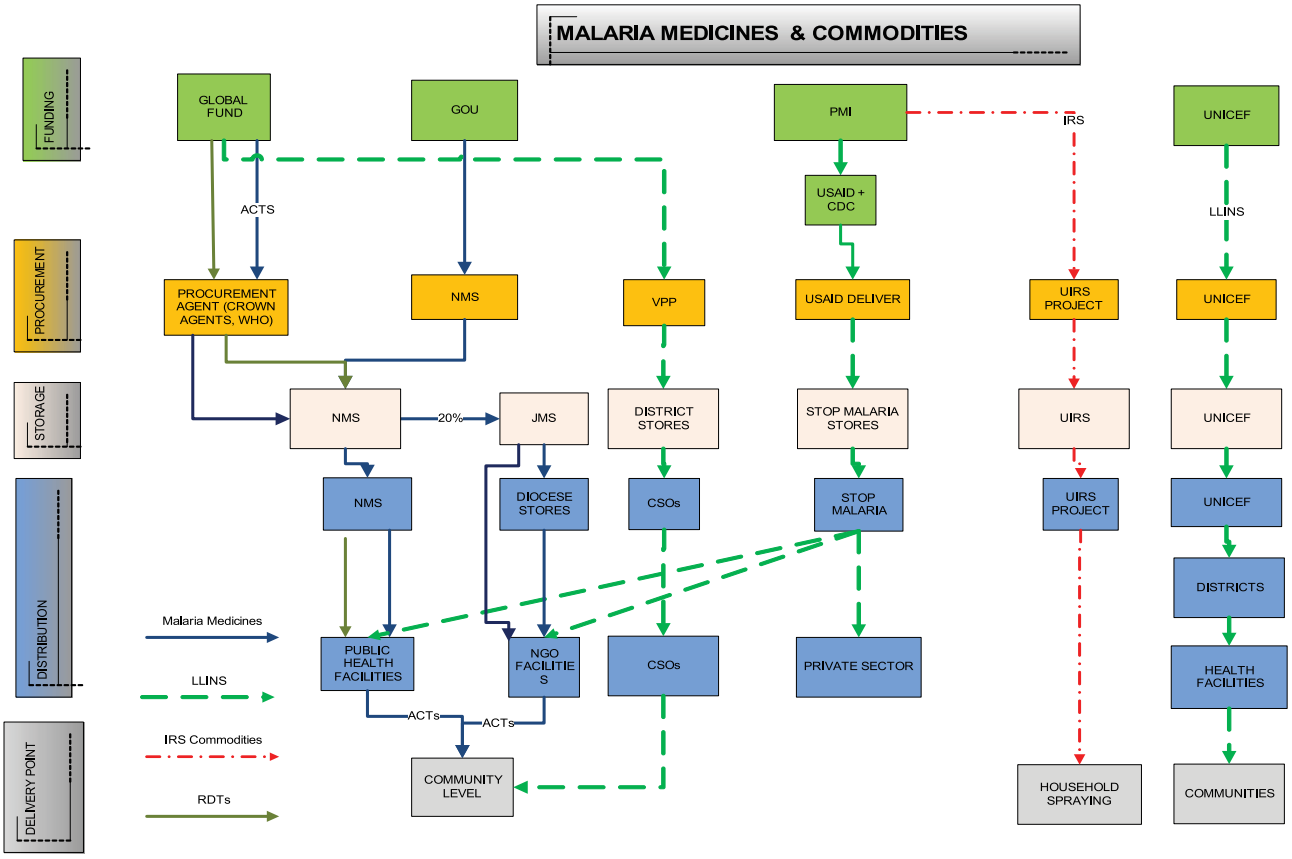
8.6 Storage and Distribution

The National Medical Stores has the mandate to store and distribute EMHS for public health sector facilities. Bi-monthly delivery/distribution schedule by NMS is published and disseminated to all stakeholders. JMS stores and distribute on cash and carry basis to PNFP, Public and Private Health facilities.

Districts have storage for commodities in transit to the lower level health facilities for final dispensing to the service users. Commodities for use in the communities under the HBMF/ICCM strategy are issued to VHTs from the nearest supervising health facilities *(NMCP HBMF implementation guidelines)*.

8.7 Malaria Commodities Flow in Uganda

Figure 22: Malaria commodities flow diagram



8.8 Quality Control

The National Drug Authority (NDA) is mandated to ensure safe and efficacious medicines and other health supplies get into the country. All EMHS in the country are registered, and there is mandatory verification testing for all commodities including Lot testing for RDT's., NDA also conducts Post marketing surveillance to ensure medicines and other commodities remain efficacious at points of use, Before registration of any product NDA carries out inspections of manufacturing plants for Good Manufacturing Practice (GMP). NDA is also responsible for issuing annual licenses for all eligible medicine outlets; NDA also conducts Pharmacovigilance to monitor adverse events arising from use of medicines.

Quality Chemical Industries Limited (QCIL) is a local manufacturer that is prequalified by WHO for ACTs (MOU between GoU and QCIL),

UNBS conducts mandatory quality control tests on the physical attributes of LLINs.

8.9 Stock Control and Reporting

Stock control at NMS and JMS is done using software packages such as MACS and SAGE systems. Recommended stock levels at the central warehouses are maintained by both NMS and JMS at minimum and maximum of four (4) and six (6) months respectively. At the health facility level, stock control for malaria commodities is integrated alongside all other essential *medicines (stock control cards, HMIS 015 Form),* NMS and JMS move with delivery notes to the health facilities when distributing ad these have to be signed on by receiving officers at the district and health facilities, Reports of stock outs are submitted monthly by public and PNFP health facilities. Rapid SMS is currently being piloted by UNICEF in Gulu and Kabale for tracking stock position at health facilities, At national level, stock status reports are produced every two months for selected malaria commodities (ACTs, SP and RDTs).

With the introduction of drug kits for the lower level facilities, there has been accumulation of a number of medicines including ACTs and other malaria commodities in some areas while others experience stock outs of same or other commodities. Interventions to address this issue include; redistribution from overstocked facilities, emergency orders by facilities to NMS and adhoc requests to development partners for support. Management of expired stocks is done in compliance with PPDA guidelines for disposal/boarding off. NDA guidelines for separation of expired commodities from commodities with active shelf life and storage of the expired commodities before disposal is observed. The Ministry of Health is developing guidelines for reducing expiries of medicines and health supplies including reverse logistics. Expired medicines and health supplies that have accumulated in health facilities across the country are being handled by the NMS through a 3rd party agent. Ministry of Health has developed guidelines for handling of pharmaceutical waste in order to guide the districts and facilities to safely deal with such waste.

8.10 National Drug Policy

A National Drug Policy (NDP) 2007 is in place to guide medicines management in the sector. The major aim of the policy is to ensure efficacious medicines at affordable cost are constantly available and rationally used to mitigate the effects of the disease burden in the country. The policy elaborates nine key areas of medicines management highlighting the objectives and strategies to achieve the desired outcomes. The policy stresses the need for research to inform the policy and integrates the contribution of traditional medicines in provision of health care in the country.

A National Pharmaceutical Sector Strategic Plan was developed to guide the implementation of the National drug Policy. This document details the activities to be carried out in order to implement the nine key policy issues in a five year period including the cost implication. The current NPSSP II runs for the period 2010-1015.

A review of the Drugs Act 1970 resulted in the NDA/Pharmacy Statute (1993). However this was a promulgated document of both the policy and regulation. This has undergone revision to separate the policy component that culminated in the NDP 2007. The regulatory components that were retained constitute the National Drugs Authority Act. The review process to include other components including control of food in the NDA Act is ongoing. The major mandate of the NDA currently is to ensure the quality of all the medicines used in the country. Among the medicines that have undergone mandatory testing over the period of the MPR have been the malaria commodities. Other functions of the NDA include registration of products, inspection of drug outlets and manufacturing premises, post marketing surveillance and conducting pharmacovigilance. The NDA continues to work in close collaboration with the NMCP to ensure safe and efficacious malaria commodities are available in the country for both the public and private sectors

8.11 Key Issues

a) The availability of malaria commodities at service delivery points remains a problem largely due to poor coordination and collaboration between the NMCP, Pharmacy Division (PD), Procurement Unit (PU) and NMS.
b) There is lack of up-to-date data on the country malaria burden to guide forecasting and quantification.
c) Supply of CQ to health facilities leads to use of chloroquine for malaria treatment which is against the current recommendation of using ACTs for the treatment of malaria.
d) Poor/ inadequate awareness and adherence to the existing policy and guidelines
a) Implementation of new treatment guidelines without due consideration for a transition period leading to wastage/expiries of commodities or slow uptake

b) Non-compliance to policies and guidelines by the private sector
c) Inadequate/inaccurate consumption and morbidity data and therefore no standard methodology for quantification and estimating requirements
d) Inadequate coordination between NMCP and partners
e) Inadequate funding for procurement, distribution and monitoring of malaria commodities
f) Adhoc procurement plans tagged to available funding; and where available, the procurement plans are not adhered to
g) Delayed or prolonged procurement process as a result of late initiation, delayed evaluation, administrative reviews, etc
h) Fragmented storage and distribution resulting in multiple deliveries to one facility
i) The push system of EMHS kits to health centre IIs and IIIs resulting in stockpiling and/or stock outs across the country
j) Limited capacity of NDA to handle testing of large batches of malaria commodities
k) Inability to detect and prevent stock outs, pilferage, expiry and overstocks of malaria commodities at health facility level

8.12 Action points

a. Improve and maintain communication / collaboration between NMCP, PD, PU and NMS on PSM issues.
b. Strengthen quantification of malaria commodities.
c. NMS procurement of malaria commodities should be guided by the Ministry of Health policies.
d. Routine distribution of CQ to health facilities should be stopped and a mechanism set up to withdraw the current large stocks of CQ in health facilities.
e. Involve private sector players in developing and implementing policies and guidelines
f. Build capacity in medicines management through support supervision, training and records management
g. Review staffing norms in line with MoH strategies
h. Strengthen functionality of lab systems
i. Advocate for institutionalization of data, tools and methodologies
j. Advocate for increased GoU funding for PNFP facilities
k. Advocacy and effective communication, including timely reporting by the Global Fund Principal Recipient/MoH
l. Involve all partners in development of a consolidated procurement plan for malaria commodities which is based on the country needs
m. Mobilize resources for timely funding of procurement plans
n. Build capacity in procurement planning and monitoring at central level (PD, NMCP, NMS, etc.)
o. Build capacity in the user departments to inform and monitor procurement processes

9.0 ADVOCACY AND COMMUNITY MOBILIZATION

9.1 Introduction

Advocacy and social mobilisation are very important supportive interventions to create behaviour change for malaria prevention and control at all implementation levels. They are designed to put malaria high on the political and development agenda and to foster political will, solicit for increased resources on a sustainable basis and hold authorities accountable to ensure pledges are fulfilled and results achieved. The goal of advocacy and social mobilisation as derived from the NMCP Strategic Plan is to leverage strategic communication to facilitate the realization of the targets of the Uganda Malaria Control Strategic Plan.

The Malaria Control Program was established in 1995 basically focussing on curative services with communication only embedded within case management. The importance of Communication was recognised later by the Abuja declaration of 2000 which had its progress indicators based on behaviour change at household level. The first official Malaria Control Communication Strategy focused on Case Management and Malaria in Pregnancy. As an output posters and leaflets were designed and printed, radio talk shows and media articles produced, and National and District leaders' sensitisations implemented.

9.2 Behaviour that increases the risk for malaria

Pregnant women are at a high risk of getting infected with malaria as their immunity is compromised. The risk is further exacerbated by failure to take precautionary measures like sleeping under insecticide treated nets, taking intermittent preventive treatment, seeking information on prevention and control from the service providers and early treatment seeking behaviour.

Children under five (5) years of age are particularly vulnerable due to their weak immunity that is not yet fully developed. Their risk to malaria illness is aggravated by practices of their caretakers not seeking treatment early and not making the children sleep under insecticide treated nets.

Other groups potentially at risk of malaria include Internally Displaced Persons (IDPs), people living in low lying areas, people living in malaria prone areas, and people living with HIV/AIDS and other chronic illnesses like T.B. The above populations are also characterized in terms of rural and urban residential locations, where among the urban are those who live in low lying areas like slum dwellers while the rural are hard to reach and are poor in terms of social economic development.

9.3 The Current Advocacy Strategy

The Advocacy strategy enlists support and commitment from all leaders for resource mobilisation, raising the malaria profile in the country, and stimulating effective policy formulation. Both political and religious leaders at all levels have been engaged through mass media, health promotion events as well as interpersonal communication. Advocacy has been critical in successful implementation of programme campaigns going through micro planning that includes policy makers, individuals of high profile in the district and Sub County and Parish level implementers.

Successful engagement of leaders and beneficiaries in campaigns led to:

a. High coverage of the beneficiaries for service uptake e.g. National LLINs mass distribution campaign was a success with all the registered beneficiaries collecting their nets, Home based management of fever (HBMF) registered success across the country with significant decline of malaria prevalence in the districts of Kiboga and Kumi , Indoor Residual Spraying (IRS) uptake registered an over 95% success in the districts of Kabale, Gulu, Kitgum, Amuru and Pader and high level of acceptance of treatment policy change over time

b. High utilization of services and products e.g. IRS where over 95% of the targeted houses in northern and south western Uganda accepted their houses to be sprayed and increased LLIN utilisation has been observed among the beneficiaries (social mobilisation activity reports);

c. High level of national, district, Sub County, parish and community ownership of NMCP programmes. This has been observed and demonstrated from the mass LLIN distribution campaigns and IRS campaigns where VHTs have spearheaded community mobilisation country wide.

d. In 2001, as a way of operationalizing the Abuja declaration advocacy meetings with Members of Parliament, religious leaders, district leaders, women leaders and line ministries were held, Africa Malaria day was observed and Advocacy materials designed

e. Malaria featured in the President's Manifesto of 2006 as a priority area of government focus.

f. The Prime Minister's office established a malaria coordination office.

g. 300 mile walk in 2007, (Kampala-Gulu via Masindi) led by Ceryl Boyones, Gen. Salim Saleh and Gen. Elly Tumwine raised the malaria profile in Uganda.

h. Parliament elevated Malaria to Sub-committee level within the Social Services Committee.

i. Universal coverage with LLINs was launched in 2009: spearheaded by IEC/BCC during the first World Malaria day commemoration where advocacy for use of LLINs was key. . There was intensive social mobilisation for demand generation and correct and consistent use of LLINs through the hang up campaign. The methods for social mobilisation employed included dissemination of messages through mass media, places of worship, print media, electronic media and community mobilisation with help of film vans and the local leadership.

j. Malaria Technical working group (TWG), which is composed of IEC/BCC technical team and partners, was created. The districts also formed malaria committees as a TWG.

k. Malaria champions/ Advocates for malaria were identified (Gen. Elly Tumwine, Themba Khumalo, Edgar Watson, Charles Ssali and Ceryl Boyones).

l. The Malaria Notice Board and Malaria Newsletter were initiated

m. Grand Rounds on malaria have been held annually

9.4 The Current Social Mobilisation strategy

The Social Mobilisation strategy promotes uptake of malaria prevention and control interventions at community level. This has been boosted by the Village Health Teams (VHTs) engaging in community mobilisation, information dissemination, dispensing medicines, distribution of LLINs, supporting hang-up of nets, guiding IRS spray teams and also acting as health alert focal persons in case of epidemics. Additionally there has been successful engagement through social mobilisation with Religious Leaders, Traditional leaders, Local leaders, Women groups, CBOs, and VHTs who have been targeted through various approaches such as ecumenical events at national level and courtesy calls at district level to advocate and disseminate malaria messages.

They are provided with malaria factsheets and requested for opportunities to talk about malaria during worship and cultural events. These have contributed to establishing a vibrant HBMF program at community level[17], increased uptake of IPTp, enhanced uptake of LLINs, positive attitude to and increased demand for IRS and RDTs.

[17] *Uganda Malaria partnership program report, 2006*

9.5 Mass Media

Mass media is another support strategy to advocacy and social mobilisation whose contribution cannot be over emphasised. It is as a means of public communication reaching a large audience using various methods of media technology including radio, television, newspapers, folk media, mobile phone SMS and internet. It has greatly impacted on both advocacy and social mobilisation.

9.6 Interpersonal Communication

Interpersonal communication strategy allows for more focused messages to support behaviour change using person-to-person approach. Successful engagements have been conducted through; Sensitisation meetings at all levels, Courtesy calls on leaders, Community talk-shows with help of mobile film vans, Health Events, Places of worship including temples, churches and mosques, House to house mobilisation, Exhibitions, Debates and symposia.

9.7 Partnerships and Alliance Building

Partnerships and Alliance building strategy has been used to complement available efforts to support advocacy and social mobilisation. Through guided arrangements, partners are implementing, capacity building and community mobilisation activities. These are regulated through the advocacy and social mobilisation working group where partners have agreed to cooperate and advance mutual interests to achieve behaviour change. Some of the Health communication partners include;

Health Communication Partnership (HCP), Population Services International- PSI (now PACE), Uganda Health Marketing Group (UHMG), Stop Malaria Project (SMP), Voices, WHO, Malaria Consortium, UPHOLD, MMV, PILGRIM, RTI, Uganda Red Cross, CDFU, AMREF, NUMAT and MACIS.

Through this partnerships NMCP has achieved country wide coverage of communication interventions, produced and distributed IEC materials, developed film documentaries, designed web pages for malaria information, implemented innovations like road shows, promoted malaria information through sports, built capacity of staff especially DHEs and brought on board corporate sponsors for malaria programmes.

9.8 Behaviour Change Communication

Advocacy and social mobilization interventions derive guidance from the Health Promotion & Education (HP&E) Division component of the overall policy for the Ministry of Health. Communication strategies to support malaria prevention and control have been developed cognizant of the Malaria control strategic plan[18]; to date three editions have been developed since 2001[19], and Implementation guidelines and communication tool kits have been designed.

Since the year 2000, NMCP has been engaged in Case Management, Insecticide Treated Nets (ITNs) uptake and use, Indoor residual spraying (IRS), Larviciding, Intermittent Preventive Treatment in pregnancy (IPTp) and Epidemic Preparedness and Response. Success of these interventions required application of communication interventions to effect behavioural change.

Advocacy and Social mobilisation interventions have been applied to promote these interventions focusing on disseminating messages on early treatment seeking, prompt and effective case management and adherence to treatment. These were geared towards behaviour change based on the national policy on malaria treatment of 2005.[20] The messages targeted mainly parents and caretakers of children under five and expectant mothers. At health facility level health workers were trained on counselling skills and oriented on the treatment and prevention messages as well as use and application of communication

[18] *Malaria control strategic plan 2001/2-04/5*
[19] *Uganda communication strategy for malaria 2005-10*
[20] *National policy on malaria treatment.*

aides. Health facilities were also provided with tailored messages in form of flip charts, brochures and posters to sustain information dissemination. Intermittent preventive treatment in pregnancy is also emphasised at the health facility since goal oriented Antenatal Care (ANC) is an opportunity for providing health information to expectant mothers. Communication was also applied to promote Rapid Diagnostic Tests (RDTs) acceptance and demand generation, mainly targeting the district leadership, health workers and VHTs.

IRS uptake: In 2007 when MOH had a district leaders' sensitisation on IRS in Gulu, resistance from the chairman and the District council was observed. A study tour of politicians from Gulu and Amuru was organised to the districts of Kabale and Kanungu where the IRS had initially been piloted with success. Interaction with fellow politicians, health workers and community was effected and this gave them an insight and confidence that the insecticide was safe to both humans and animals. On visiting some health facilities they witnessed a significant decrease in malaria cases after execution of the pilot. On return from the tour they addressed the community through radio programs about their visit and encouraged them to embrace the program. Gulu still resisted the excecise and were sensitised by their counterparts from Pader, Kitgum and Amuru. Thereafter IRS coverage for targeted structures in the region was excellent: Kitgum 95%, Pader 97%, Amuru 98.5% and Gulu 99%. The entire community is well aware of the program and its benefits though social mobilisation is limited to radio talk shows conducted by the local leaders including politicians, religious and opinion leaders. The community mobilisers (LCs) mobilise the community on the spray schedules. It's now a community driven exercise.

Insecticide Treated Nets (ITN) ownership and use: NMCP adopted the Abuja declaration for increasing use of bed nets as a strategy for malaria prevention. In collaboration with HP&E, NMCP devised a strategy for promoting use of bed nets in malaria prevention. It was realised that these nets would be more effective if used when treated with insecticides. As the campaign progressed there were a number of challenges some of which were a barrier to communication. A case in point was accessibility and affordability of the nets.

NMCP in collaboration with Malaria Consortium conducted the exercise in 20 districts of high net coverage as guided by the Netmark report of 2003 and surveys conducted between 2000 and 2003. With intensive social mobilisation the beneficiaries responded to the net re-treatment exercise positively. Through the campaigns about 74% net re-treatment was achieved.

NMCP in collaboration with partners devised means of distributing nets among some selected vulnerable groups like Internally Displaced Persons (IDPs). During this exercise messages on effective use and maintenance of the nets were emphasised. The messages were disseminated through a multi-channel approach including radio, posters, brochures and community film and talk shows.

Epidemic preparedness and response (EPR); Uganda has experienced a fair share of malaria epidemics in different parts of the country at different times. EPR is part of the IEC/BCC strategy but has not been operationalized. During these difficult times advocacy targeting the district leadership is done to solicit for support from the political leadership in terms of making appeals for the affected communities to take precautionary measures. Intensive community social mobilisation including IEC material distribution, film van operations, holding community meetings are conducted. IEC has often faced the challenge of epidemics occurring spontaneously which makes planning difficult. The response to the epidemic involves preparing communication logistics including IEC materials, assembling a social mobilisation team and contacting the district team to find out the exact problem on the ground, identify the affected communities and the categories affected.

The channels of communication varied from intervention to intervention as the targeted audiences varied. However, from a generic point of view households and families were reached using radio, drama, posters leaflets, community and religious leaders and community support groups like VHTs. Advocacy engagements with the community leadership was achieved through interpersonal communication (IPC) channels like meetings and courtesy calls. Some special printed material would also complement the IPC.

9.9 Policies on IEC and Community Mobilisation

The HP&E has developed a number of communication strategies for malaria. These include the MOH Communication Strategy for Home-Based Management of Fever[21], Malaria in Children and Control of Malaria in Pregnancy in Uganda, 2001-2005[22], and the MOH Communication Strategy for Treatment of Uncomplicated Malaria Using Artemether/Lumefantrine (AL), August 2004[23] and the 2005 Malaria communication strategy targeting:

- Community leaders, health unit management committees, community resource persons, civil society and community-based organisations, and other individuals and groups that make decisions, lead opinions, influence decision-making and undertake work at community level.

Households: Individual spouses and partners, immediate family members and extended family members that influence or are responsible for decision-making and behaviour within the household and among household members. Different categories of materials have been approved including posters, pamphlets, flip charts, jingles, songs, and films

9.9.1 Communication strategy and guidelines

NMCP has through the years implemented communication activities guided by the communication strategies. These include among others;

- Communication Strategy for Home-Based Management of Fever
- Malaria in Children and Control of Malaria in Pregnancy in Uganda, 2001-2005,
- MOH Communication Strategy for Treatment of Uncomplicated Malaria using Artemether/ Lumefantrine (AL), August 2004.

A more comprehensive communication strategy for malaria prevention and control has been developed awaiting approval from MoH top management.

9.9.2 Message Development

The MoH through the HP&E has a policy on the process of developing health promotion messages. Messages are developed basing on the problem that needs to be addressed, determining the target audience and appropriate channels for those audiences, and bearing in mind the socio-cultural norms while designing the materials. . The messages and materials are then pre-tested and finally brought for approval to MOH.

NMCP in collaboration with HP&E, and partners has developed and distributed several pieces of materials for the different malaria intervention areas.

9.10 IEC/BCC Performance

The targets for IEC BCC vary from intervention to intervention and also the magnitude of the problem at hand. However at community level awareness should be achieved at 100% and commitment to change at 80% for all interventions. However, the M&E component for IEC/BCC has been weak and only a few indicators have been developed. Most activity reports generated for IEC/BCC activities only suite the technical aspects as required by the responsible officer. When planning for IEC/BCC there is need to engage the M&E specialist to harmonise indicators and report formats. A mechanism to collect data on IEC/BCC from the district needs to be developed as the other mechanisms like HMIS do not capture social mobilisation and communication aspects.

Generic process Indicators for IEC/BCC: Number of messages disseminated, Number of materials (posters, flip charts, brochures, radio spots) produced and distributed, Number of radio programs conducted, Number of people sensitised and leaders met and sensitised. There are no outcome and impact indicators for advocacy and social mobilisation, hence the need to develop these.

[21] *Communication strategy for Home based management of fever.*
[22] *Malaria in Children and Control of Malaria in Pregnancy in Uganda, 2001-2005*
[23] *MOH Communication Strategy for Treatment of Uncomplicated Malaria Using Artemether/Lumefantrine (AL), August 2004*

9.10.1 Access and delivery points

Depending on the communication channel used the following delivery points are used to mount posters and banners and interact with the key mobilisation agents (LCs, VHTs and other local leaders): Health facilities, Strategic locations like schools, trading centres, churches etc

Advocacy and social mobilisation is coordinated by the Health Promotion and Education (HP&E) division of MoH across all programs including NMCP.

- A Senior Health Educationist was deployed to NMCP to coordinate advocacy and social mobilisation activities. The officer supports all malaria interventions single-handed, which brings about work overload.
- At the District level the District Health Educator (DHE) is designated to coordinate IEC/BCC programs at the district level in liaison with the District Health Officer (DHO) and Malaria Focal Person (MFP). However, in Districts where the DHE is not the MFP advocacy and social mobilisation is very low. The DHE has Assistant Health Educators at Health Sub District level though their potential has not been fully exploited by the technical officers as they do not appreciate their role. At the district there is also the Community Development Officer with communication skills and experience of the community, however the challenge is that NMCP does not take advantage of them to promote program activities. This has been so due to oversight when planning for social mobilisation.
- At community level the VHT structure has been established by MoH to support the health delivery system. In the case of NMCP the VHTs have supported the program in medicine distribution under HBMF program, ITN distribution and collection of data and dissemination of health messages. Each village has about six VHTs and two of them are mandated to coordinate malaria activities. There is a challenge in service delivery at the community in terms of geographical location and access to logistics in time of need

9.10.2 Functioning TWG on Advocacy, BCC and Community Mobilisation

Through partnership and coordination an IEC/BCC technical working group (TWG) was established in 2008 and meets whenever need arises especially during national and international events organising and development and review of important documents like communication strategies. The TWG meets to share experience, lessons learned and best practices, and support joint programmes like commemoration of national and international days. The TWG also reviews messages and materials under development for creation of harmony and standardisation and provides a forum for sharing and replication of communication materials in various programs and areas of implementation. Partners in the TWG contribute in the development of national resource mobilisation proposals like those to the Global Fund. The partners facilitate TWG meetings with venues, where planning and programming issues are discussed. This arrangement has created harmony and transparency among the partners. The Malaria Control strategic plan 2001/2-2004/5[24] has the terms of reference for this TWG.

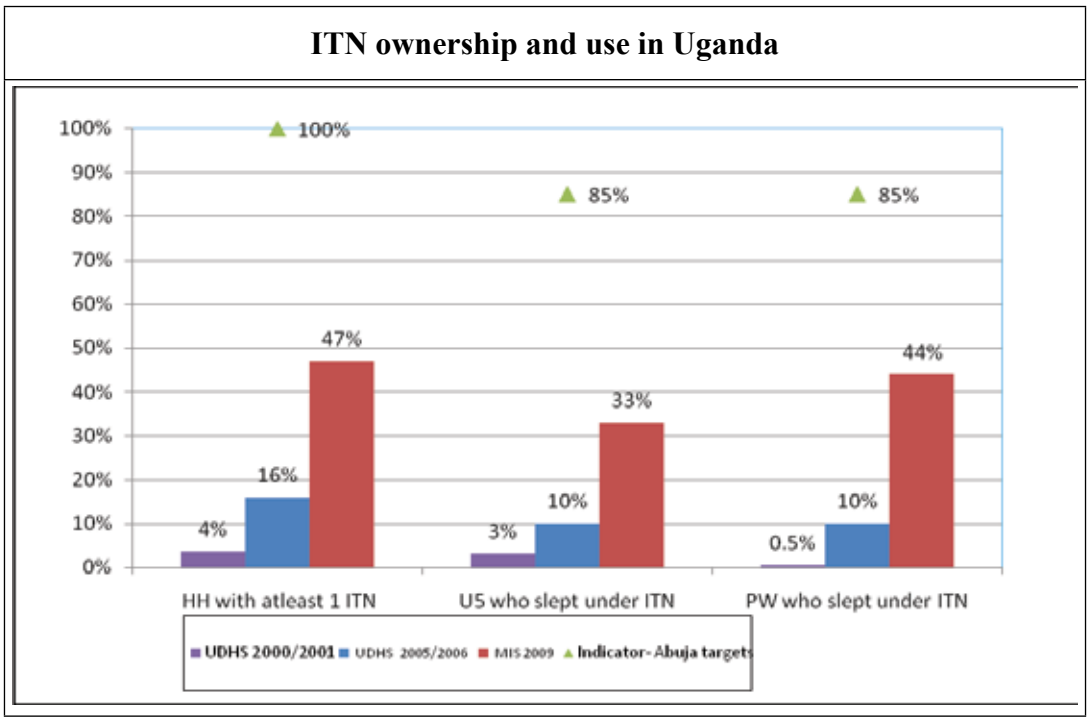
9.10.3 Key achievements

a. The Uganda Demographic Health Survey (UDHS) of 2001[25] highlighted practices on net possession and use, net treatment with insecticides, knowledge on malaria in pregnancy and malaria treatment.

b. The Malaria indicator survey (MIS) of 2009[26] assessed awareness on malaria causes, prevention and treatment. The study revealed that on average over 89% across all age groups knew the right cause of malaria. The study also assessed the level of exposure to malaria messages in the population and revealed that about 60% of the respondents had heard or seen malaria messages across all age categories.

[24] *Malaria control strategic plan 2001/2-2004/5*
[25] *UDHS 2001 pg. 137-140.*
[26] *MIS 2009 pg. 32*

Figure 23: ITN Ownership and use



c. Campaigns during malaria upsurges include: HBMF, Pilot of HBMF in Kiboga, Kanungu and Kumi, Retreatment of ITNs, and LLINs distribution during floods in Teso Sub region and landslides in Bududa

d. CAPSS pilot study in Eastern Uganda, UMCP in West Nile (Wellshare), Pilgrim with IRS in Katakwi

e. Increased Funding for developing materials, media coverage, social mobilisation and training

9.11 Key Issues

1) Inadequate and erratic funding and poor staffing still hampers BCC implementation.
2) IEC materials developed are sometimes not focused and seldom in local languages.
3) Operational research to guide IEC/BCC interventions is lacking.
4) IEC/BCC activities are implemented on an ad hoc basis which weakens the impact of social mobilization interventions.
5) High cost for sustained/consistent placement of messages in the media (television, radio, newspapers)
6) Inadequate M&E for BCC interventions/limited evidence to demonstrate impact and prioritise activities

9.12 Action Points

1) Mobilise the parliamentary malaria sub-committee of the Social Services Committee to continually raise the profile of malaria.
2) Appoint a Malaria Goodwill Ambassador for advocate to raise the profile of malaria and for advocacy
3) Formulate BCC outcome indicators to monitor and evaluate BCC activities
4) Conduct KABP studies
5) Revitalize the Newsletter and Notice Board, document best practices and regularly update the MOH website.

10.0 SURVEILLANCE, MONITORING, EVALUATION AND OPERATIONAL RESEARCH

10.1 Introduction

Sound monitoring and evaluation (M&E) is critical in order for any disease programme to be able to demonstrate progress in achieving outcomes and impact in prevention and control efforts.

Over the last ten years, the NMCP has so far implemented two strategic plans all of which had defined indicators to measure progress towards targets. During the review period several major milestones were made: HMIS moved from being a system processing disease and epidemic reports to one which is more inclusive (including human resource data, financial and material resources reporting. Staffing levels have also increased to a fully fledged M&E Unit with 3 senior medical officers, 3 technical assistants and a data manager. A Global Fund supported M&E Systems Strengthening Assessment was conducted in 2008, and the NMCP launched its first Monitoring and Evaluation Plan 2008-2010 in February 2009, this plan defines national malaria indicators, sources and frequency of collection of data, measurement as well as mechanisms to track progress towards set indicators.

10.2 Human Resources, Training and Capacity Development

The Uganda national malaria control programme has a monitoring and evaluation plan whose execution is being managed by a Monitoring and Evaluation Unit which has 7 staff dedicated to M&E. The malaria M&E Plan is modelled around the priorities of the overall MoH plan. Officers of the M&E unit are also members of the overall sector Monitoring and Evaluation Technical Working Group housed under to the Quality Assurance Department. As in other areas of the NMCP there are also two M&E specialist staff seconded as technical support to the NMCP from the Global Fund Focal Coordination Office and one through PMI support.

10.3 Informatics support

The programme has computers, software, e-mail and Internet network for districts and Zonal malaria Coordinators. However, the computers lack antivirus software and a routine backup system, so valuable information is sometimes lost; there is no universal portal for information storage, so if there are staff changes and personal IT equipment goes with the staff, data is lost. There are country websites and a process for updating except this has not been done regularly and the full potential of the website has never been realized. Web-based reporting is yet to be realised.

Table 11: Chronology of key events in malaria monitoring and evaluation in Uganda

Year	Events
1996	▪ First M&E Officer recruited but shortly goes for further studies
1997	▪ 2nd M&E Officer recruited as a replacement for the one who left for studies ▪ Facilitated establishment of a monitoring systems for epidemics using the normal channels ▪ Led teams to conduct trainings in all Epidemic prone Districts in Uganda ▪ Developed implementation guidelines for EPR ▪ In general, all work plans and budgets had a section/annex on M&E stating indicators, definition/ measurement of indicator/periodical targets and means of verification
1998	▪ Ministry of health HQs moved from Entebbe to Wandegeya. GTZ supported TA to establish and strengthen M&E systems and reporting ▪ 11 Sentinel sites established as part of the East African Network to Monitor Anti-malarial Therapies
2000	3rd M&E Officer recruited to replace second one who joined WHO AFRO
2001	▪ Formation of UMSP (UMSP, ESD, MUUCF, IPH, LSHTM) ▪ Sentinel sites handed over to MUUCF (UMSP) from EANMAT
2002	UMSP set ground for TET at sentinel sites countrywide
2003	▪ Started TET for CQ/SP; AQ & SP
2004	▪ TET on AQ and AS
2005	▪ 2005-2008 TET on ACTs AL & DP ▪ Compared TET on Coartem and DP in Tororo, Kanungu & Apac
2006	▪ Sentinel Site disease surveillance started ▪ Included ACT stock out reporting on HMIS ▪ UDHS done ▪ Creation of UMRC by presidential decree
2007	▪ Introduction of the Global Malaria Programme Database ▪ Carried out 1st MESST that led to development of M&E plan
2008	▪ M&E Specialist recruited under Global Fund support
2009	▪ M&E Specialist under PMI support ▪ Equipping of M&E Unit and other staff with desks, computers, and a database server placed within the MoH Resource Center ▪ Developed and disseminated 1st M&E Plan for NMCP. ▪ 1st M&E Organogram for M&E developed in consultation with RBM partnership ▪ Training on AMP LLIN impact measurement ▪ Conducted 2nd MESST ▪ Conducted Malaria Indicator Survey
2010	▪ Hosted EARN meeting for the first time in Uganda where idea of MPR was first introduced ▪ Training in Malaria Impact measurement (TZ) ▪ Dissemination of MIS results and report

10.4 Achievements

During the review period, the following achievements were made:

- Initiated sentinel site surveillance in Uganda
- Completed, launched and disseminated the first ever NMCP M&E plan

- Contributed to Annual Sector Performance reports 2008/9, 2009/10
- Completed MESST 2009 to feed into new M&E plan (2010/11 to 2014/15) currently in draft
- Completed GF PU DRs for Round 4 Phase II and Round 7 Phase 1
- Spear headed quarterly RBM partnership meetings
- Training in Advanced surveillance M&E for Malaria control, pre-elimination and elimination in Moscow & Addis Ababa
- Conducted the first ever MIS in 2009
- Training in AMP LLIN impact
- Training in Impact Assessment
- Spearheaded writing of M&E component of GF Round 10 proposal
- Establishment of the Global Malaria database and NMCP database server
- Increased funding to the M&E support from PMI and Global Fund
- Increased technical assistance in the M & E unit.
- Increased staffing of M & E specialist to the NMCP program by partners.

10.5 Routine information system

HMIS is a facility based system where each facility reports inputs, outputs and outcomes as the routine information system. These are then collated and reported monthly and annually. The key malaria information reported and disaggregated by sex, age (less than five years and 5 years and above) by the HMIS include suspected malaria cases at OPD, number of suspected malaria cases tested by microscopy, number of confirmed malaria cases at OPD, number of inpatient malaria cases including in pregnant women, number of clinical and confirmed inpatient malaria cases, number of malaria deaths, antenatal attendance, IPT1 and IPT2, and slide/RDT positivity rates. The HMIS also collects information on stock-out of first and second line anti-malarial medicines and other health management indicators.

According to the Ministry of Health's Strategic Plan (HSSP II, Republic of Uganda 2005), a number of problems limited the effectiveness of the HMIS. Data collection and reporting forms were not adequately distributed to heath care facilities and district health offices. There was recognition that reporting forms were not properly filled and submitted, nor was data properly analyzed, fed back and utilized by the District Health Offices and health facilities for planning and managerial decision-making. The Ministry of Health also has experienced shortages of health information personnel, and the Resource Centre in Kampala has suffered from shortages of basic computers and software to facilitate the analysis of routine health data. HMIS data were not validated regularly thus quality was not adequate at times. Trends over the years are not easy to follow because of the disproportionate proliferation of Districts whose status are erratically granted politically. The numerous numbers of data required to be filled, disaggregated and summarised for each disease entity makes it a very laborious activity most times shunned by busy and poorly motivated health workers.

A 2009 study assessing impact of anti-malarial interventions (WHO, NMCP 2009) found that of 24 HF assessed countrywide, 21 (87.5%) had complete OPD data while only 8 (33.3%) had complete In-patient data for the period 2005-2008. Integration of reporting on community based activities and Private sector health care is still not fully realised in the current HMIS. The community medicine distributors' HBMF register provided for reporting on total number of children seeking treatment, number of children treated within and beyond 24 hours, number of children referred, number of children treated who subsequently died and drug availability. However, only the total number of children treated and those treated within 24 hours is included in the health facility monthly HMIS report. The main challenge to this system is the voluntary nature of the work of the CMDs with no means to enforce monthly reporting causing incompleteness of reporting, and ultimately lack of summary data from health facilities. Because of these challenges the

current HMIS is not able to capture data generated at community level. Innovations such as the HBMF quarterly review meeting at Sub county level adopted by implementing partners to collect this data were tried but could not be sustained beyond the project lives as they proved too costly to manage beyond the project cycles.

10.5.1 Epidemiological Surveillance

Epidemiological surveillance is done through sentinel sites which were first established in Uganda in 1997 to determine the efficacy and safety of antimalarial drugs in the various malaria epidemiologic transmission sites in Uganda. Results from these studies have been positive in influencing anti-malarial policy change from Chloroquine to the Chloroquine/SP combination and the Artemisinin-based combination therapy currently adopted for management of uncomplicated malaria.

Since then the focus of the sites has shifted to include monitoring and epidemiological surveillance of other malaria indicators as well. There are currently 6 sites in total and these are located in the districts of Apac (2), Jinja, Tororo (2), and Mubende. This system collects total number of patients seen per month, number of patients suspected of malaria, number of patients with blood smear or RDT done and proportion of patients with a malaria positive blood test from OPD and IPD, number of patients treated for malaria disaggregated by the anti-malarial drugs prescribed. UMSP also collects data on treatment/prescription practices of health care workers. The sentinel sites are considered model malaria management health facilities with relatively well motivated project staff working with an electronic data management system. Better quality data is collected and serves as a proxy for HMIS. The necessary and sufficient conditions for replication of such project funded sites in the rest of the Public and Private Not for Profit health facilities are yet to be realised in the rest of such facilities.

10.5.2 Pharmacovigilance

The reporting of adverse drug reactions (ADR) as part of the pharmacovigilance system in Uganda is not well developed. Based on the WHO model, the National Drug Authority of Uganda (NDA) has designed a generic form to collect passive reporting data on all medicines; however, this system only reports limited numbers of adverse drug reactions. UMSP, in collaboration with NDA, has been involved in preliminary work on monitoring adverse events related to antimalarial medicines. Although there are no core indicators collected by this system, the data will help triangulate some of the findings with regard to acceptability of ACTs.

10.5.3 ITN monitoring system

In 2007, the NMCP in collaboration with PMI developed and implemented an Excel database for tracking ITNs imported into the country. This collaborative project developed a composite database tool with various sources of relevant information. The database harmonized the reporting requirements of 16 National Malaria Prevention and Control Monitoring and Evaluation Plan, the NMCP, Ministry of Health, and also the Health Sector Strategic Plan 2005-2010 indicators. The ITN database and its corresponding digital model were to be used to monitor ITN partner activities and coordinate prospective ITN distributions to fill coverage gaps in specific sub-counties. The information generated by this system was meant to be fed into the NMCP Composite Database. However, the harmonization of the systems within the database was overtaken by events such as the breakdown in consistency of the database functionality and the urgent need to track large volumes of GF Round 7 Phase 1 nets which couldn't wait for such perfect conditions. Data was tracked manually and also with Microsoft excel sheets and is yet to be integrated into the yet to be functional Global Malaria database.

10.5.4 IRS monitoring system

Surveillance, monitoring and evaluation of IRS have two components; the activity monitoring and the entomologic surveillance system. At all levels during IRS operations the following main indicators are collected: the proportion of the targeted houses sprayed, the proportion of targeted houses fully and partially sprayed, the proportion of the targeted population protected and the refusal and absentee rates that help the programme to estimate the acceptability of the IRS exercise by the local communities. This data is collated by team leaders and summarized by the sub-county supervisors to generate administrative coverage at sub-county and district levels before they are forwarded to the MoH.

10.5.5 Routine performance reporting in NMCP

Monitoring inputs, processes and outputs is important for tracking program performance, and ensuring availability of financial, human and other resources. Monitoring outputs is crucial for determining the level of service delivery that is achieved during implementation efforts. In Uganda routine implementation reports are compiled to understand progress of district-level implementation of selected interventions. At national level, compilation of activity/campaign reports by the programme and the stakeholders are coordinated by the Team leader/focal person responsible, sent to the relevant M&E unit for further analysis and synthesis of level of achievement of relevant indicators and compilation of performance reports. A number of reports (sometimes with unique formats) are required periodically from different national and international centres including the NDC CDC meetings, Planning Unit (MoH), the Focal Coordination Office for Global Fund, the WHO Country Office, PMI and others along the reporting hierarchy.

M&E activities face several challenges. Lack of a clear division of labour amongst the M&E Officers, lack of SOPs for reporting, storage space for reports; delays or incompleteness in submission of activity reports; deliberate withholding of information, lack of clarity on roles of NMCP Officers vis-a-vis the M&E staff causing unnecessary friction and lack of cooperation are some of the major challenges in reporting. The team has also experienced lack of team work and explicit undermining of accurate and timely reporting. This further undermines efforts towards resolution of the reporting problems, and organisational learning and development.

10.5.6 Integrated disease surveillance (IDSR)

Adopted in 2001, Integrated Disease Surveillance and Response in Uganda is the weekly epidemiological surveillance reporting system that reports on diseases of epidemic potential. This system provides data on malaria cases and deaths on a weekly basis. The major challenges facing this system are completeness and timeliness of reporting (being 60% and 50% respectively in 2007) due to inadequacy of communication facilities, human resources and of reporting tools. Innovations such as the weekly publication of this weekly report in the mass media have also been affected by inconsistency in funding.

10.5.7 Electronic web-based HMIS

The programme has computers, software, e-mail and internet network for districts and Zonal Malaria Coordinators. However, the computers lack antivirus software and a routine backup system as a result of which valuable information is sometimes lost; there is no universal portal for information storage so if there are staff changes and personal IT equipment goes with the staff, data is lost. There are country websites and a process for updating except this has not been done regularly and the full potential of the website has never been realized. The web-based reporting is yet to be realised.

10.5.8 Data quality audits

The MoH provides malaria technical Support supervision to all the districts at least once every quarter. Currently the supervisory approaches include integrated supervision by the Area Teams, supervision by the malaria zonal coordinators and district malaria focal persons on all aspects of malaria control using

standard checklists developed by the NMCP in consultation with other stakeholders. Data from these supervisions was meant to be analysed and used and stored for easy access by those responsible for carrying on subsequent supervision visits and follow-up. However, because of lack of financial resources, in the last two years the NMCP has only been able to conduct one round of supervision to 80 out of the 112 Districts. The rest of the time only a few regions got supervised and mainly in areas where the main implementers are NGOs. However, data from support supervision is not analysed, used or stored. This may be due to the fact that supervision is viewed as a mere financial resource than as a way of supporting implementation. In many instances field visits are conducted to those areas where there are personal interests of those carrying out the supervision than programmatic interests.

A recent Belgian Technical Cooperation/Ministry of Health sponsored study found several factors that affected supervision including heavy staff workload with competing priorities; availability of funds; transport logistics; lack of standard supervision guidelines and checklists, and insecurity in some districts. Districts noted that their supervisors' practices were generally good, but practices that need to be improved included supervision visit scheduling and keeping to these schedules; review of results of previous visits to determine the focus for next supervision; documentation and reporting; and follow up of supervision recommendations from supervision activities. Supervision reports were only available in 15.2% of the facilities and seen with 17% of supervisors, while 52.1% of the respondents claimed there was a follow up of supervision recommendations. There was no system for monitoring of local government supervision of lower level facilities, and supervision efforts at lower levels were found to have no reporting system upwards to the MoH. There was no effective mechanism of pooling all supervision results from the national and district level. Only 36.7% (n=112) facilities had a work plan and budget for supervision. Funding for supervision activities is irregular at all levels and this affects the effectiveness of supervision efforts since follow up is not regular.

10.6 Malaria Surveys

10.6.1 Community Surveys

The latest Uganda Demographic and Health Survey (DHS) was conducted in 2006. The 2001 and 2006 DHS included a malaria module with standardized questions on coverage of key interventions including fever treatment among children under five with antimalarial drugs and possession and use of ITNs, as well as all-cause child mortality and anaemia prevalence. No biomarkers were drawn during the 2001 and 2006 surveys. Another DHS is planned for 2011. Because the questionnaires are standardized and structured and change little between surveys, DHS results are comparable over time.

The first Malaria Indicator survey in Uganda was done in 2009. Excerpts from the results have been quoted in different sections of this document, with some illustrative tables comparing results with those from the two UDHS (2001 and 2006) here below. Another such household survey was the ACT Watch Study which aimed to generate evidence for policy makers on methods to increase availability and decrease the consumer price of quality assured ACTs.

10.6.2 Health Facility Surveys

In 2007, the Uganda Service Provision Assessment (SPA) was undertaken and it was designed to collect information on the availability and quality of reproductive and child health care, infectious diseases (malaria, TB and HIV/AIDS) services provided to the Ugandan population.

Table 12: Chronology of surveys to date

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
UDHS	X					X				X
SPA			X		X		X			
KAP	X			X				X		
MIS									X	
30 Cluster		X				X				

10.7 Malaria database

GMP/WHO introduced a malaria database that was meant to function as a repository for all the malaria data generated from all available sources within the country in 2008. However, due to staffing changes and equipment malfunctions, the database never became fully operational. There is currently support to revive this database and partners will be requested to provide all historical data and this, combined with MOH data will be entered into the database. Routine data will be collected, entered and maintained thereafter.

10.8 Operational research

Before 2001 malaria research was rudimental and mainly done for academic purposes. Since then, there has been an increase in malaria studies with policy implications. To-date, about 300 studies have been conducted from which a good number of papers have been published in peer reviewed journals. Research in Uganda is generally conducted under the auspices of the Uganda National Council of Science and Technology (UNSCT). Health research is particularly vetted by the Uganda National Health Research Organization (UNHRO) in addition to UNSCT.

Within the MoH, there has been a creation of the Malaria Research Centre. NMCP works in close collaboration with the Uganda Malaria Research Centre (UMRC); an establishment by a Presidential Directive (2004) as a directorate which became functional in April 2006 with funding from DFID-Uganda. The administrative hierarchy is by an Interim Director, one research officer, administrator, accounts and operations officer and support staff. Housed in a rented building, the UMRC, and NMCP worked together *albeit* the financial and other bottlenecks over the time. One major activity for the centre was setting up a research priority setting meeting for stakeholders in 2006 in which topics of public health importance were fronted as key factors in malaria prevention and control in Uganda

10.9 Performance of NMCP strategic plans 2000/1 – 2004/5

The Malaria Control Strategic Plan 2001/02 – 2004/05 had defined the following key targets to be achieved during the 5 years of its operation:

a) 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
b) To increase the proportion of pregnant women receiving IPT to 60% by end of 2005.
c) To increase the proportion of children aged less than 5 years, regularly sleeping under Insecticide Treated Nets (ITN) to 50% by end of 2005.
d) To reduce malaria case fatality rate, at hospital level, to 3% by end of 2005.

Table 13: Summary of the achievements with respect to the core malaria indicators

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

From the table above the programme was close to achieving the target on proportion of under five children receiving appropriate treatment within 24 hours but fell short on IPT2 and proportion of children sleeping under an ITN. Due to increased availability of efficacious interventions such as ACTs, LLINs and IRS and the international drive to scaling up, the NMCP in the subsequent strategic plan 2005/6 -2009/10 sought to promote positive behaviour change and to rapidly achieve and sustain high coverage levels for this intervention package. Only IRS managed to achieve the set target which was limited to those six districts that had been targeted. Although LLIN coverage was good IPT2 is weak (39.6% compared to 80% target), children under five receiving appropriate treatment within 24 hours at 13.7% compared to the target of 80%, with so many health facilities experiencing stock outs of life saving ACTs. Most of these can be attributed to suspension or delays in release of Global Fund, without immediate Government plans to mitigate the situation during much of the life of the strategic plan.

Table 14: Summary of intervention coverage indicators

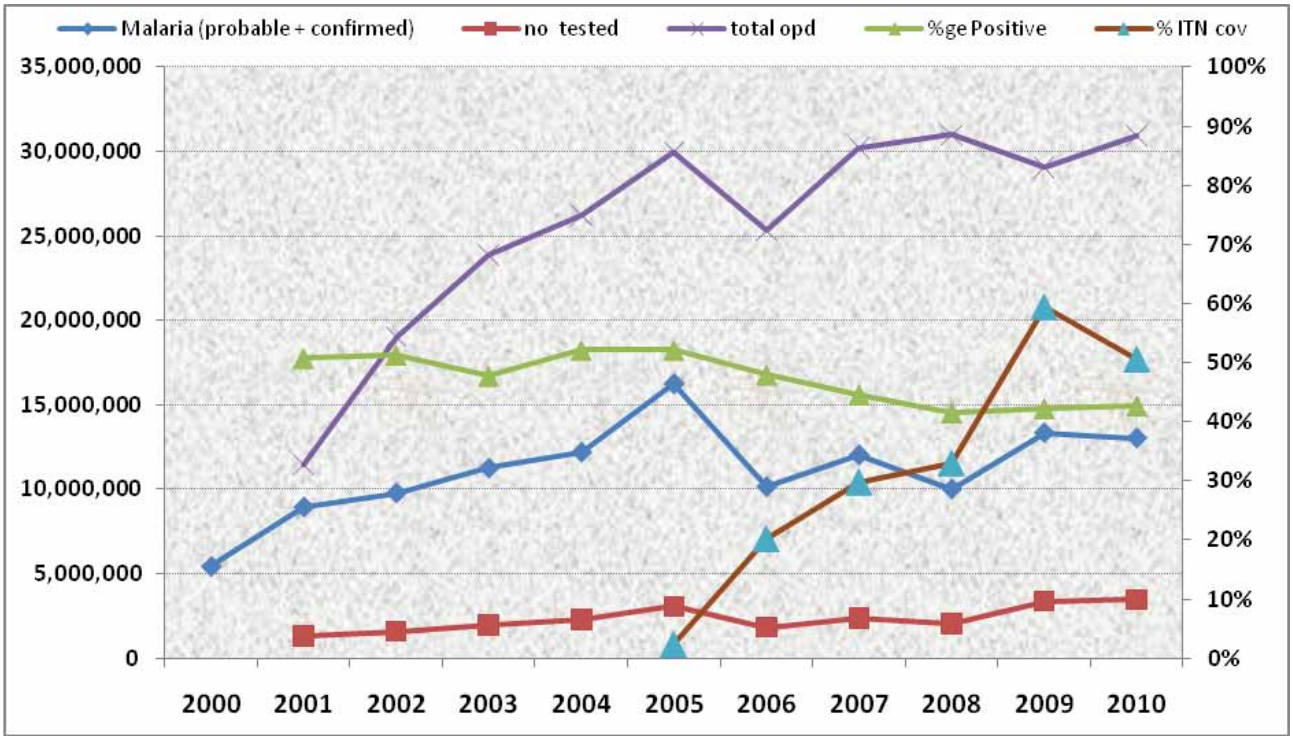
RBM Intervention	Indicator Description	UDHS 2001	UDHS 2006	UMIS 2010
Insecticide treated nets (ITNs) and Indoor Residual spraying (IRS)	Proportion of households with at least one ITN	12.8%	**21.4%**	46.7%
	Proportion of households with at least one mosquito net – any type	12.8%	**34.3%**	58.6%
	Proportion of children under 5 years old who slept under an ITN the previous night	7.3%	**10%**	32.8%
	Proportion of households with at least one ITN and /or sprayed by IRS in the last 12 months	**NS**		49.2%
	Proportion of households sprayed with insecticide in the last 12 months	**NS**	**6.2%**	5.5%
Prompt and effective treatment and use of diagnostics	Proportion of children under 5 years old with fever in the last 2 weeks who received any antimalarial treatment	NS	**61.3%**	59.6%
	Proportion of children under 5 years old with fever in the last 2 weeks who received antimalarial treatment according to national policy (using ACT) within 24 hours from onset of fever		**28.9%**	3.2%
	Proportion of children under 5 years old with fever in the last 2 weeks who had a finger or heel stick	NA	**NA**	17.1%
Prevention and control of malaria in pregnant women	Proportion of pregnant women who slept under an ITN the previous night	0.5% Vs 6.6%	**10%**	43.7%
	Proportion of women who received intermittent preventive treatment for malaria during ANC visits during their last pregnancy (IPTp2)	**33.8%**	**16.2%**	**31.7%**

The above table depicts progress made in the delivery of interventions from household surveys. Intervention coverage has generally increased over the years with the proportion of households with at least one ITN increasing from 12.8% in 2001 to 46.7% in 2010, and the proportion of children under the age of 5 years who slept under an ITN the previous night increasing from 7.3% in 2001 to 32.8% in 2010. The proportion of households with at least one ITN and /or sprayed by IRS in the last 12 months was 49.2% in 2010. The number of districts who use spraying has remained 10 at a maximum with enviable operational coverage of around 90%. The proportion of under 5s with fever in the last 2 weeks who received any anti-malarial treatment remained at comparable levels of 61.3% in 2006 and 59.6% in 2010. About 23% of the malaria cases are tested in Uganda and the proportion of children under 5 years old with fever in the last 2 weeks who received antimalarial treatment according to national policy (using ACT) within 24 hours from onset of fever from 29% to 3.2% in 2006 and 2010 respectively. The proportion of women who received intermittent preventive treatment for malaria during ANC visits during their last pregnancy (IPTp2) increased from 16% in 2006 to 31.7% in 2010.

10.10 Evaluation of impact on malaria cases

Over the last ten years malaria has been a major contributor to OPD attendance though as evidenced from the table below this has not always been the case as the graphs diverge between 2006 and 2010 with Total OPD increasing despite decreased malaria reporting.

Figure 23: Total OPD and malaria OPD trends over the last ten years including country net coverage



Numbers tested have also been same on average indicating no increase in access to diagnostics beyond the higher levels of care namely HC III, IV and Hospitals. Proportion testing positive has remained within the 40s, while net coverage does not seem to have the desired impact on Malaria cases at OPD and perhaps only slightly on those testing positive.

10.11 Key issues

a) Malaria data remains inadequate, untimely and incomplete due to the weaknesses that exist in the HMIS system.
b) Data on in-patient malaria admissions and deaths is not being systematically collected.
c) No system exists for collecting and integrating data from the private sector, which provides services to more than 50% of the population into the HMIS.
d) There is no functional malaria database within the NMCP.
e) A clear research agenda to guide programmatic implementation has not been outlined.
f) Malaria interventions do not appear to be having a significant impact on malaria trends
g) Lack of evaluation of impact of environmental changes on transmission
h) Malaria risk stratification is outdated
i) Weak linkages with other epidemiologically-important departments – e.g.. Meteorology dept.

10.12 Action Points

a) Strengthen data collection, recording and reporting at source
b) Strengthen regular data analysis and review at health facility, district and national levels
c) Establish a mechanism for data collection and reporting from private sector health care facilities
d) Operationalize the NMCP composite malaria database and assign responsibilities for its routine and overall management.
e) Develop standard reporting templates for partners to facilitate the incorporation of partner data into the NMCP database.
f) Establish and regularly update a research agenda that is disseminated to all partners
g) Develop an M&E capacity building plan for equipping of units and training of all staff involved with data handling and management.
h) Conduct more regular support supervision to improve quality of service delivery, sentinel site surveillance, IDSR and establish proper mechanisms for analysis, use and storage of supervision reports.
i) There is need for wider dissemination of the M&E plan including discussions on indicators, their definitions, data sources, to all levels and adoption by the NMCP of standard data collection, storage, transmission and reporting tools with clear SOPs covering all interventions
j) Support quarterly review meetings of health workers with CMDs/VHTs at sub county level

11.0 Conclusions and Recommendations

Malaria is endemic in the entire country with an average malaria parasite prevalence rate of 45%. Reported malaria cases from outpatient department have increased from 28% in 2001 to 45% in 2010 and parasitological testing for malaria has minimally increased from 5% in 2001 to 24% in 2010. The average positivity rate is at 45%. The review was unable to describe impact on malaria admissions and deaths because this data is not collected by the HMIS.

Intervention coverage has generally increased over the years with the proportion of households with at least one ITN increasing from 12.8% in 2001 to 46.7% in 2010, and the proportion of children under the age of 5 years who slept under an ITN the previous night increasing from 7.3% in 2001 to 32.8% in 2010. The cumulative number of districts who have used spraying has remained 10, with an enviable operational coverage of around 90%. While the proportion of under 5s with fever in the last 2 weeks who received any anti-malarial treatment remained at comparable levels of 61.3% in 2006 and 59.6% in 2010 the proportion of children under 5 years old with fever in the last 2 weeks who received antimalarial treatment according to national policy (using ACT) within 24 hours of onset of fever dropped from 29% to 3.2% in 2006 and 2010 respectively. The proportion of women who received intermittent preventive treatment for malaria during ANC visits during their last pregnancy (IPTp2) increased from 16% in 2006 to 31.7% in 2010.

Over the last ten years NMCP has implemented two Malaria Strategic Plans (MSP) 2000/1 – 2004/5 and 2005/6 - 2009/10. The Uganda NMCP has mobilized funding from the government and the Global Fund, the United States President's Malaria Initiative and DFID and the Government of Uganda has waived taxes and tariffs on several anti-malarial commodities and user fees in public health facilities were abolished to increase access to health services. However, the positioning of the NMCP within the MoH organogram is low resulting in a minimized mandate and authority to head, coordinate partners and guide malaria policy and implementation. The NMCP does not develop annual integrated work plans. Within the NMCP team work is weak and has led to a breakdown in leadership. Malaria activities are mainly implemented by the central level even where the districts are mandated and/or most appropriate for implementation.

Vector control in Uganda combines the use of indoor residual spraying (IRS), long lasting insecticidal nets (LLINs) and on a limited scale, larval source management. IRS was reintroduced in 2006 and has been expanded to 10 districts protecting approximately 3 million people. Since 2009 Uganda is targeting universal access by the whole population to LLINs. In 2010, the program distributed more than 7.2 million LLINs. However, there is limited routine distribution of LLINs to pregnant women and children under 5 through the ANC and EPI services.

Malaria case management policy evolved from chloroquine (CQ) monotherapy to CQ+SP to ACTs in the last decade and the policy on malaria diagnosis has changed from clinical to parasitological based diagnosis. Home based management of fever (HBMF) introduced in 2002 has now been incorporated into Integrated Community Case Management (ICCM). However, there are frequent stock-outs of antimalarial medicines and supplies at health facilities and community level as well as non availability of RDTs.

A malaria surveillance system generates weekly data from all health facilities and epidemic thresholds have been developed in epidemic prone districts, although the values are still based on clinical cases. Also, there are no malaria EPR guidelines and plans.

In the area of procurement supply management all antimalarial medicines and laboratory commodities are listed on the Essential Medicines List of Uganda and are available through the NMS, JMS and the private sector. ACTs and SP are part of the tracer medicines for monitoring the Annual Health Sector Performance. However, there are still stock-outs of anti-malarial medicines and supplies at service delivery points. There is lack of up-to-date data on the country malaria burden to guide forecasting and quantification. Also chloroquine is supplied to health facilities leading to its use for malaria treatment against the current recommendation by the MOH.

The NMCP has a malaria communication strategy and guidelines for advocacy and social mobilization implementation and a focal person responsible for its implementation. The NMCP had a malaria newsletter and notice board which are no longer functional. There is a Parliamentary malaria subcommittee of the Social Services Committee and, in general, high level visibility on issues related to malaria advocacy. However, BCC implementation is often done without operational research to guide it. In addition, the review finds that Uganda implements IEC/BCC in an ad hoc fashion which weakens the impact of social mobilization interventions.

There has been increased support from partners in strengthening capacities for M&E within NMCP. In 2008, the NMCP developed the first ever M&E plan. The first Malaria Indicator Survey was conducted in 2009. Malaria data remains inadequate and incomplete due to a weak HMIS. No system exists for collecting and integrating data from the private sector. There is no functional malaria database within the NMCP. A clear research agenda to guide programmatic implementation has not been outlined.

Based on the review several key recommendations have been drawn. The NMCP needs to take up its responsibilities as a national malaria programme mandated to lead, guide and coordinate malaria control efforts. To effectively do this, the MOH should elevate the NMCP to the level of a Department in the MoH where it is able to participate in key policy, technical and resource allocation decisions. The NMCP should conduct joint annual review and planning meetings involving all malaria stakeholders including districts where joint annual work plans can be reviewed and developed, thereby coordinating efforts by all stakeholders. The NMCP should revitalize the zonal and district coordination mechanism to facilitate a more decentralized approach to malaria control.

To effectively carry out its mandate the NMCP needs to work with the relevant departments to strengthen data collection, recording and reporting, regular data analysis and review at health facility, district and national levels. In particular, routine malaria surveillance (outpatient and inpatient) needs to be strengthened and standard reporting templates for partners should be developed to facilitate the incorporation of partner data into the NMCP malaria database. The NMCP should mobilise the parliamentary malaria sub-committee of the Social Services Committee to continually raise the profile of malaria. The NMCP should also revitalize previously used communication channels, document best practices and regularly update the MOH website as a way of regularly sharing information. In addition, the NMCP should establish and regularly update a research agenda that is disseminated to all partners.

With regard to delivery of interventions the NMCP should rapidly scale up vector control (LLINs and indoor residual spraying) and case management interventions to achieve universal coverage including using the community level and the private sector. The NMCP should use malaria burden data and consumption data to strengthen quantification and availability of malaria commodities. Routine ITN distribution should be

strengthened to allow all pregnant women and newborns get nets through the ANC services. In addition, the National Medical Stores procurement of malaria commodities should be guided by the Ministry of Health policies.

In conclusion, the Ministry of Health comprehensively reviewed the malaria programme over the period 2001 to 2010. While progress has been made in the delivery of the key technical and supportive interventions, there remains a significant gap in achieving universal coverage for impact. The absence of quality routine data (especially from in-patient malaria cases and deaths in the light of low deployment of parasitological confirmation of malaria), does not allow for clear conclusions on the extent of the impact of the interventions Uganda has deployed so far to control malaria in the review period.

Based on the current malaria epidemiological profile, a rapid scale up of insecticidal coverage to achieve a significant level of community protection either through LLINs and/or IRS, parasitological diagnosis and prompt treatment with effective ACTs is required.

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ANNEXES

Annex 1: The SWOT analysis by thematic area

1.1 Malaria Epidemiology SWOT

Strengths	Weaknesses
Data on malaria parasite prevalence is available. VHT s for collecting and reporting community health data on malaria. Available personnel designated for HMIS reporting at district and health facilities. Availability of entomology personnel in the NMCP.	Inadequate collection of inpatient and deaths data Lack of collection of medical data from private healthcare facilities Lack of mechanism for verifying district data quality Low and incomplete HMIS reporting rates No mechanism for assessing and monitoring risk of malaria transmission
Opportunities	**Threats**
Existing mechanism for EPR in the districts Small districts make local epidemiological monitoring and reporting easy High utilisation of private sector services in addition to public sector provides wider source of data on a big proportion of the population utilising healthcare Available regional and national metrological departments to provide data on weather for predicting malaria transmission risk	Unpredictable weather pauses challenge for monitoring occurrence of malaria epidemics

1.2 Programme Management SWOT

Strengths	Weaknesses
Technically competent staff Committed Staff Functional Organizational Structure Availability of funding for key interventions Policies and guidelines in place Coordination mechanism available Some research done	Donor dependency Lack of annual performance reviews Attitude and ego problems Poor communication within the program and external partners Poor Team Work Inadequate data for exact quantification---reliance on estimates Weak HMIS and M&E systems Inadequate staffing for the various functions Personalization of jobs instead of Program belonging Lack of a shared purpose, values Lack of office space Inadequate/Lack of planning, including annual work plans Inadequate staffing Poor remuneration (low motivation) Lack of vehicles Poor communication of successes Weaknesses in Partner Coordination Lack of strategic advocates for change in malaria
Opportunities	**Threats**
Many partners Malaria has been prioritized in the National Development Plan and the ruling party manifesto Availability of malaria champions High Donor Interest in malaria Increased number of TAs GoU ring fenced funds for ACTs from QCIL (30billion), and photo biological control (3billion) GoU pre-financing of life saving commodities under approved GF grants (45billion this FY) New opportunities for communication	Diminishing donor funding Poor remuneration of staff Key positions filled by staff paid with project funds Weakness in the health system e.g. procurement, financing, service delivery, leadership, information system, harmonization Political/external interference in technical implementation Non empowerment of the program Demonization of health workers Poor socio economic status of the population Staff spending lots of time on work of Partners with little time for their core duties Prioritization of malaria not matched with commensurate resources

1.3 Vector Control SWOT

Strengths	Weaknesses
Availability of trained Medical Entomologists and VCOs for vector control training and research Efficient advocacy, IEC/BCC and social mobilization mechanisms There is political will to support VC interventions Combining IRS and targeted "MDA" achieves faster reduction of malaria transmission LLINs on high priority list of major donors There is high expressed demand for LLINs by the communities	No entomological capacity for PCR and ELISA techniques (EIR, Vector speciation, vector infection rates, resistance mechanisms) Funding for VC interventions is mainly donor driven Irregularity of implementation of IRS before 2010 affected impact on malaria burden Impact on malaria burden cannot be reduced by VC interventions alone (IRS & LLINs) alone without treatment of people carrying malaria patients No organized follow up of LLINs at household level to ensure usage LLIN suppliers offering genuine WHOPES evaluated LLINs are diminishing with some retail outlets closing Increasing reported misuse of LLINs
Opportunities	**Threats**
Integrating malaria vector control interventions into other VC programmes under IVM approach e.g. NTD (LF Pgm), Tick control through "live-bait technology" Establish and develop collaborative research initiatives regionally and internationally to address VC operational issues Integrating advocacy of VC interventions into other malaria control interventions' advocacy & social mobilization Integrating LLIN distribution and follow up into EPI and VHT structures	Withdrawal of donor/GF funding will adversely affect implementation of malaria VC interventions Development and spread of insecticide resistance especially to Pyrethroids affects IRS and LLINs effectiveness De-campaigning of the use of DDT by environmentalists and organic farmers Rains interfere with larviciding

1.4 Case Management SWOT

Strengths	Weaknesses
Availability of policies and guidelines for malaria case management Well established organizational structure for case management from national to village levels Presence of large number of trained VHTs (89,605) for HBMF Health workers trained in malaria case management National system of procurement, storage and distribution of antimalarial medicines and supplies	Inability to adequately harness and coordinate malaria expertise at national level (case management working group) Unreliable malaria data in the HMIS Continuing presumptive management of malaria without definitive diagnosis Piecemeal and fragmented implementation of activities in the era of universal coverage (HBMF, while weak facility systems) Weak support to district planning for malaria services Inadequate job aids and guidelines in the health facilities Weak supervision mechanism of malaria services to districts and the community Lack of adequate collaborative mechanism with private facilities (PF) Weak laboratory services to adequately investigate fever cases Inadequate skills and poor attitudes of some clinicians Weak referral system

Opportunities	Threats
Willingness of partners to support and work with NMCP Sentinel sites for drug efficacy monitoring and resistance testing Network of research institutions and research teams Financial support from partners (Global Fund Round 4, 7, 10, PMI, DFID) AMFm facility to increase access to and affordability of ACTs Functional in-country RBM partnership Availability of Technical support from WHO and partners	Emerging drug resistance leading to frequent policy changes and policy transition challenges Un-ending stock outs of antimalarial medicines and supplies at health facilities and community (HBMF) Inadequate government funding and over dependence on donor support System weaknesses impact case management activities e.g. procurement, financing, service delivery, leadership, information system, coordination Acceptability of new antimalarial medicines by community Inadequate capacity at health facilities for management of severe malaria (referral, blood transfusion) Inadequate staffing numbers and skills Low salaries for health workers Poor health seeking behaviour of the community

1.5 Malaria in Pregnancy SWOT

Strengths	Weaknesses
A comprehensive MIP policy on ground Implementation through existing system A reasonable number of qualified staff at all levels Use of sustainable implementation approaches Reasonable capacity in operation research/ documentation	Dispersed responsibility of the MIP program between RH & MCP Weak coordination of MIP partners Limited reporting by partners Limited involvement of private practitioners Limited supervision at different levels Limited supply & uncertainty of commodities Low quality of services in health facilities Intricacies/delays in disbursement of approved funds Absence of MIP research agenda/funding Weak monitoring and documentation of MIP activities
Opportunities	**Threats**
Increasing country resource base Broad constituency of many interested parties (MCP, RH, CH) Prioritiness of malaria on different agenda Increased communication channels A number of partners with different expertise, capacities and funding levels RBM forum that brings together actors Several other funded programs to ride on	Diminishing donor funds without corresponding increased local funding Preconditioned donor funding Increased political interference Demonization of staff by politicians Limited number of partners on MIP Weak/over burdened health system Re-centralization of all procurement Limited & unmotivated staff at all levels Increasing parasite resistance to SP Poor referral system

1.6 Epidemic Preparedness and Response SWOT

Strengths	Weaknesses
EPR is one of MCP malaria control priority interventions There is a focal person for EPR in MCP EPR guide lines developed	No buffer stocks of drugs and supplies for EPR Community EPR not developed Inadequate funds to appropriately respond to epidemics No specific funds for Malaria EPR District plans for EPR not available in some districts No NMCP annual EPR work plan Lack of Malaria sentinel sites in some Districts Lack of diagnostics at Health units hence un reliable malaria normal channel Early prediction using KEMRI model not yet implemented

Opportunities	Threats
EPR Support by PMI Sentinel site availability in two epidemic prone districts Existence of IDSR division Willingness of Meteorological department to partner with NMCP	Pulling out of PMI in support for sentinel sites

1.7 Procurement and Supply Management SWOT

Strengths	Weaknesses
Policy & guidelines in place Linkages with technical departments in MoH and development partners National quantification for malaria commodities in place **Efficacy monitoring of medicines, insecticides, RDTs** Planned regular monitoring and supervision.	Inadequate dissemination of guidelines Frequent changes in the guidelines Inadequate/inaccurate consumption and morbidity data Inadequate coordination between NMCP and partners No standard methodology for quantification and estimating requirements Lack of expertise in quantification No PSM plan for malaria commodities outside of GF applications/grants Inadequate capacity to monitor procurement systems and pipeline at central level Inadequate mechanisms for monitoring stock situation at health facility level Limited Diagnostics capacity resulting in presumptive treatment of malaria cases Weak management information systems for commodities

Opportunities	Threats
Malaria commodities included on the NDA register Technical expertise in partner organizations Establishment of a quantification and procurement planning unit Active GF grants – AMFm, R7, & anticipated R10 GoU has ring-fenced funding to support procurement of malaria commodities HDP willingness to finance malaria commodities Increased financing for EMHS in Vote 116 Three year rolling procurement plan UMTAC and national supply plans being developed Support from HDP towards strengthening PSM **Existence of functional NDA** Harmonized HMIS forms for tracking stocks ACTs, SP are part of the six tracer medicines Collaboration with development partners in strengthening capacity for commodity management Strengthening of HMIS by various partners	Non-compliance to specifications by NMS and other procurement agencies Lack of cooperation by partners in providing data Poor/unknown quality of data from health facilities for quantification Lack of human resources for quantification of requirements Non-adherence to procurement plans by NMS Some partners do not feed into the three year rolling procurement plan Withdrawal of DANIDA funding Weaknesses of GF mechanisms – e.g. delayed disbursements, mismanagement, demands of GF, Donor requirements Procurement of commodities outside the guidelines Poor performance by suppliers on contractual obligations Weak institutional capacity for procurement Poor coordination between NMS - procurement agency; pharmacy division and NMCP on malaria control strategies/ interventions e.g. HBMF Some commodities in the policy are not included in the procurement plan e.g. rectal artesunate, IV artesunate Some partners do not feed into the three year rolling procurement plan Non-compliance to MoU to provide 20% of commodities to JMS **Limited capacity of NDA to handle testing of large batches of malaria commodities** Limited capacity to perform some quality testing e.g. RDTs and other lab supplies Accumulation of expired medicines Kit system leading to accumulation or stock out of ACTs at some sites) Inadequate technical trainers for pre-service and in-service training

1.8 IEC/BCC SWOT

Strength	Weaknesses
Enabling policies Presence of DHEs across the country VHTs and CMDs support IEC/BCC at community level Tools and guidelines to eliminate malaria support message development and dissemination	Inadequate Staffing Weak policy on partnership Inadequate M&E for BCC interventions to demonstrate impact and prioritising BCC interventions
Opportunities	**Threats**
Partners in Malaria to support advocacy Global support: RBM, GFATM, PMI to support implementation of IEC/BCC interventions Scientific evidence to eliminate malaria to support advocacy among our leaders Political support at parliamentary level Emerging technologies Community leadership support advocacy and mobilisation Partners with M&E systems to measure impact of IEC/BCC interventions	The policy governing CSOs mandates them to only report to their licensing authority and not the sector in which they implement their programs. Cultural social norms create resistance to IEC messages Diminishing financial support from development partners due to the Global credit crunch High media costs for message placement

1.9 Surveillance, Monitoring and Evaluation and Operational Research SWOT

Strengths	Weaknesses
Overall Sector Policy, strategic & M&E plans in place Well staffed M&E Unit with 3 TAs supporting 4 MoH staff	Lack of annual implementation plans Non functional composite data base Low quality of HMIS No clear tools and methods for reporting on routine implementation Lack of pre-agreed performance plans & mechanism for holding Officers accountable for performance in various area Lack of a learning culture Lack of team work Failure to 'let go' to lower implementation levels
Opportunities	**Threats**
RBM Partnership UNICEF/PMI funding Dedicated Research and academic institutions In-Country expertise that needs to be harnessed	Weak overall health systems Lack specific funding for M&E Lack of a shared purpose/destiny Lack of ownership Overall attitude of staff towards M&E activities Lack of empowerment from higher levels Lack of an established command structure and a functional enforcement hierarchy Lack of facilitation for M&E activities Poor working environment

Annex 2: Aide Memoire

Government of Uganda
Ministry of Health

Uganda Malaria Programme Performance Review

May 2011

Aide Memoire

I. Purpose

The malaria program review (MPR) is a periodic joint programme management process for reviewing progress and performance of country programmes with the aim of improving performance and refining or redefining the strategic direction and focus. This *aide memoire* summarizes the major findings and critical actions emerging from the Uganda MPR. The *aide memoire* is a re-statement of the joint commitment of the Ministry of Health and partners, to work together to follow up on the recommendations of the MPR and support implementation towards the long term goal of achieving a malaria-free Uganda. It is neither a memorandum of understanding nor a legal document. There is a detailed report of the MPR from which this *aide memoire* have been derived.

II. Background

The Ministry of Health, through the National Malaria Control Programme (NMCP), in collaboration with partners decided to undertake a comprehensive review of the progress and performance of the malaria programme for the period 2000 to 2010. This decision was made in the context of the development of a new national malaria policy and strategy as the current versions expired in 2010. The findings of this review will feed into the development of these documents, which guides the future drive towards achieving universal coverage and maintenance thereof.

The objective of the review was to assess the current strategies and activities with a view of strengthening the malaria control programme for sustaining the gains made and achieving further reductions in the malaria burden. The specific objectives of the MPR were to review the epidemiology of malaria in Uganda; to assess progress towards achievement of national, regional and global targets by intervention thematic areas and service delivery levels; to review the structure, organization, and management framework for malaria control within the health system and the national development agenda; and to define the next steps for sustaining and improving program performance.

The review was organized in 3 phases. Phase 1: consultation with partners to agree on the need and scope of the review, and develop a plan for the review; Phase 2: desk reviews with the production of the thematic reports; and Phase 3: with the support of an external review team, undertook consultations with senior management of the Ministry of Health, and representatives of partner agencies and stakeholders, including civil society. Field visits to district hospitals, health centres and communities were also undertaken to validate findings of the desk reviews.

III. Key findings and action points

1. Malaria epidemiology

Malaria is endemic in the entire country except a few areas of low transmission that are prone to epidemics. A Malaria Indicator Survey conducted in 2009 reported high prevalence of malaria

parasites in children <5 years of age ranging from 5% in Kampala to 63% in mid northern region, with a national average of 45%.

Reported malaria cases from outpatient department have increased over the years from 28% in 2001 to 45% in 2010. In the same period, there has been only a minimal increase in the proportion of parasitological testing for malaria, from 5% in 2001 to 24% in 2010 with an average positivity rate of 45%. Due to the non availability of inpatient malaria data, this review is unable to describe the impact of malaria control interventions on severe malaria and deaths.

Action Points

a) Update the national malaria risk map and continue routine nationwide malaria prevalence and intervention coverage surveys
b) Strengthen routine malaria surveillance (outpatient and inpatient)

2. Malaria Programme Management, Policies and Strategies

The malaria control policy and the strategic plan expired in 2010 and are due for review. The Government of Uganda (GoU) has increased direct funding for malaria control interventions, and has also attracted significant funding from the Global Fund, Presidents Malaria Initiative, DFID, and RBM Partnership Secretariat. However, these resources are still not commensurate with the malaria disease burden, and are largely donor dependent. The NMCP has received consistent technical assistance from the World Health Organization and other technical partners to boost the malaria policy and implementation in Uganda. The GoU waived taxes and tariffs on ITNs, insecticides, spray equipment and malaria diagnostics. Following Presidential Directives, user fees in public health facilities were abolished to increase access to health services, and the Malaria Research Centre established.

A National RBM Partnership Forum was established and meets quarterly. However an *aide memoire* developed by this partnership forum is yet to be implemented. There is an active civil society network in Uganda. Zonal coordinators and district malaria focal positions were established to strengthen malaria implementation.

The positioning of the NMCP within the MoH organogram is low. The implication of this is a restricted decision space on policy, technical and resource allocation matters. It minimizes the mandate and authority of the programme to properly head and guide malaria policy and implementation activities, often times leading to uncoordinated efforts by stakeholders involved in malaria control.

The NMCP does not develop annual integrated work plans, making it difficult for the programme to effectively coordinate partners. The existing organogram for the NMCP is outdated. Team work within the programme is inadequate coupled with a lack of professionalism leads to multiple decision centres and a breakdown in leadership. In several instances, malaria staff spends a lot of time implementing partners' work instead of their respective mandates in the programme. Malaria activities are mainly implemented by the central level even where the district are mandated and/or most appropriate for implementation, thus leading to resignation of responsibilities by the district levels.

Action Points

a) Update the national malaria policy, strategic plan and develop joint annual work plans
b) Elevate the NMCP to the level of a Department in the MoH where it is able to participate in key policy, technical and resource allocation decisions
c) NMCP should conduct joint annual review and planning meetings involving all malaria stakeholders including districts.
d) Revitalize the zonal and district coordination mechanism to facilitate a more decentralized approach to malaria control.

e) The Government of Uganda and partners should commit more resources to malaria activities.

3. Malaria Control Tools

A. Vector control

Vector control in Uganda combines the use of indoor residual spraying (IRS), long lasting insecticidal nets (LLINs) and on a limited scale, larval source management. With support from partners, IRS was reintroduced in 2006 and has been expanded to 10 districts protecting approximately 3 million people.

The NMCP started promoting ITNs as a major vector control tool in1998 initially targeting pregnant women and children under 5 years of age and changed to universal access targets in 2009. In 2010, the program distributed more than 7.2 million LLINs. An additional 10 million LLINs is planned for distribution to achieve universal coverage by 2012.

Currently there is limited routine distribution of LLINs to pregnant women and children under 5 through the ANC and EPI services. In addition, IRS is implemented in 10 districts. In Uganda, IRS and LLINs still remains largely donor dependent. Infrastructure for effective and routine entomological monitoring on mosquito bionomics is inadequate. There are no policy guidelines for integrated vector management.

Action Points

a) Rapid scale-up of vector control activities of LLINs and indoor residual spraying to achieve universal coverage.
b) Strengthen the capacity of the Vector Control Division for malaria vector monitoring and surveillance by establishing and equipping a reference entomological laboratory.
c) Establish representative sentinel sites to monitor vector bionomics including insecticide resistance

B. Malaria Case Management

Malaria case management policy evolved from chloroquine (CQ) monotherapy to CQ+SP to ACTs in the last decade. Similarly, the policy on the diagnosis of malaria has changed from clinical to parasitological based diagnosis. Home based management of fever (HBMF) introduced in 2002 has now been incorporated into Integrated Community Case Management (ICCM). Uganda is one of the countries in the phase 1 of AMFm.

However, there are frequent stock-outs of antimalarial medicines and supplies at health facilities and community level. Although the NMCP has conducted trainings of health workers in 21 districts on the use of RDTs, its implementation is hampered by non availability of RDTs. Integrating private sector providers into national case management programme remains a challenge. In addition, there are weak services for management of severe malaria below HCIV level.

Action Points

a) Support rapid scale up of case management (diagnostics and medicines) including at the community and private sector levels.
b) Use consumption data to strengthen quantification of malaria commodities.
c) Review the policy guide on the management of severe malaria below HCIV level and improve the referral system

C. Malaria in Pregnancy

In 2001, NMCP commenced the implementation of Intermittent Preventive Treatment in pregnancy (IPTp) as a strategy which was earlier adopted in 1998. Routine distribution of ITNs through ANC remains limited. Poor coordination between the Reproductive Health Division and NMCP has hampered progress in the implementation of malaria in pregnancy activities. Stock outs, and/or the

non-stocking of SP in ANC services even when available in health facilities has also hindered the implementation of IPT.

Action Points

a) RH should take a key leadership role in MiP with NMCP providing technical support.
b) Revitalize the RBM partnership MiP subcommittee.
c) Ensure the availability of malaria in pregnancy commodities and strengthen health referral systems
d) Scale up routine ITN distribution to all pregnant women through the ANC services

D. Epidemic preparedness and response

Since 2000, six epidemics have occurred in Uganda with the most recent epidemic in 2009/10 in Mubende District. The NMCP has established a malaria surveillance system using weekly data generated from all health facilities. Epidemic thresholds have been developed in epidemic prone districts and health workers were trained in the use of these thresholds. Uganda has established two centres of excellence in early detection of epidemics. However, there are no malaria EPR guidelines and plans. The current malaria epidemic threshold values are based on the clinical diagnosis of malaria. There is the need to review and update these thresholds to take into account the introduction of malaria diagnostics.

Action Points

a) Develop an EPR plan
b) Finalize the approval of the EPR guidelines and training modules
c) Revise malaria epidemic thresholds

E. Procurement and Supply Management

All antimalarial medicines and laboratory commodities in the policy are listed on the Essential Medicines List of Uganda and are available through the NMS, JMS and the private sector. ACTs and SP are part of the tracer medicines for monitoring the Annual Health Sector Performance. The Public Procurement and Disposal of Public Assets (PPDA) act is currently being revised to address delays in medicines procurement.

However, the availability of malaria commodities at service delivery points remains a problem largely due to poor coordination and collaboration between the NMCP, Pharmacy Division (PD), Procurement Unit (PU) and NMS. There is lack of up-to-date data on the country malaria burden to guide forecasting and quantification. Supply of CQ to health facilities leads to use of chloroquine for malaria treatment which is against the current recommendation of using ACTs for the treatment of malaria.

Action points

a) Improve and maintain communication / collaboration between NMCP, PD, PU and NMS on PSM issues
b) Strengthen quantification of malaria commodities.
c) NMS procurement of malaria commodities should be guided by the Ministry of Health policies
d) Routine distribution of CQ to health facilities should be stopped and a mechanism set up to withdraw the current large stocks of CQ in health facilities.

F. Advocacy Communication and Social Mobilization

The NMCP has a focal point person, malaria communication strategy and guidelines for advocacy and social mobilization implementation. There is a functional advocacy and social mobilization working group at national level. The NMCP had a malaria newsletter and notice board which are no longer functional. There is a Parliamentary malaria subcommittee of the Social Services Committee. Uganda

commemorates the Africa Malaria Day/World Malaria Day annually with high level political participation.

However, inadequate erratic funding and staffing still hampers BCC implementation. IEC material developed is sometimes not focused and is seldom in local languages. Operational research to guide IEC/BCC interventions is lacking. IEC/BCC activities are implemented on an ad hoc basis which weakens the impact of social mobilization interventions.

Action points

a) Mobilise the parliamentary malaria sub-committee of the Social Services Committee to continually raise the profile of malaria.
b) Formulate outcome BCC indicators to monitor BCC activities
c) Conduct KABP studies
d) Revitalize the newsletter and notice board, document best practices and regularly update the MOH website.

G. Surveillance, Monitoring and Evaluation and Operations Research

The NMCP over the last ten years has implemented two Malaria Strategic Plans (MSP) 2000/1 – 2004/5 and 2005/6 - 2009/10. There has been increased support from partners in strengthening capacities for M&E within NMCP. In 2008, the NMCP developed the first ever M&E plan. In addition, a National Malaria Research Centre was created in 2004. The first Malaria Indicator Survey was conducted in 2009.

Malaria data remains inadequate, untimely and incomplete due to the weaknesses that exist in the HMIS system. Data on in-patient malaria admissions and deaths is not being systematically collected. No system exists for collecting and integrating data from the private sector, which provides services to more than 50% of the population into the HMIS. There is no functional malaria database within the NMCP. A clear research agenda to guide programmatic implementation has not been outlined.

Action points

a) Strengthen data collection, recording and reporting at source
b) Strengthen regular data analysis and review at health facility, district and national levels
c) Establish a mechanism for data collection and reporting from private sector health care facilities
d) Operationalize the NMCP composite malaria database and assign responsibilities for its routine and overall management.
e) Develop standard reporting templates for partners to facilitate the incorporation of partner data into the NMCP database.
f) Establish and regularly update a research agenda that is disseminated to all partners

IV. Conclusion

The MPR process comprehensively reviewed the malaria programme over the last decade. While progress has been made in the delivery of the key technical and supportive interventions, there remains a significant gap in achieving universal coverage for impact. However, the absence of quality routine data (especially from in-patient malaria cases and deaths in the light of low deployment of parasitological confirmation of malaria), does not allow for clear conclusions on the extent of the impact of the interventions Uganda has deployed so far to control malaria in the review period.

Based on the current malaria epidemiological profile, a rapid scale up of insecticidal coverage to achieve a significant level of community protection either through LLINs and/or IRS, parasitological diagnosis and prompt treatment with effective ACTs is required to achieve the vision of a Malaria-Free Uganda. Implementation of the action points in this *aide memoire* will enable Uganda efficiently use its available resources to significantly reduce the burden of malaria which still remains unacceptably high.

V. Commitment

We, as the Ministry of Health and partners, commit ourselves to the implementation of this MPR action points to facilitate the accelerated scale up of malaria control interventions for universal access and sustainable impact with the ultimate goal of malaria control and subsequent elimination in Uganda.

Signed on behalf of the Government of Uganda and Partners:

Dr. Lukwago Asuman
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Ministry of Health

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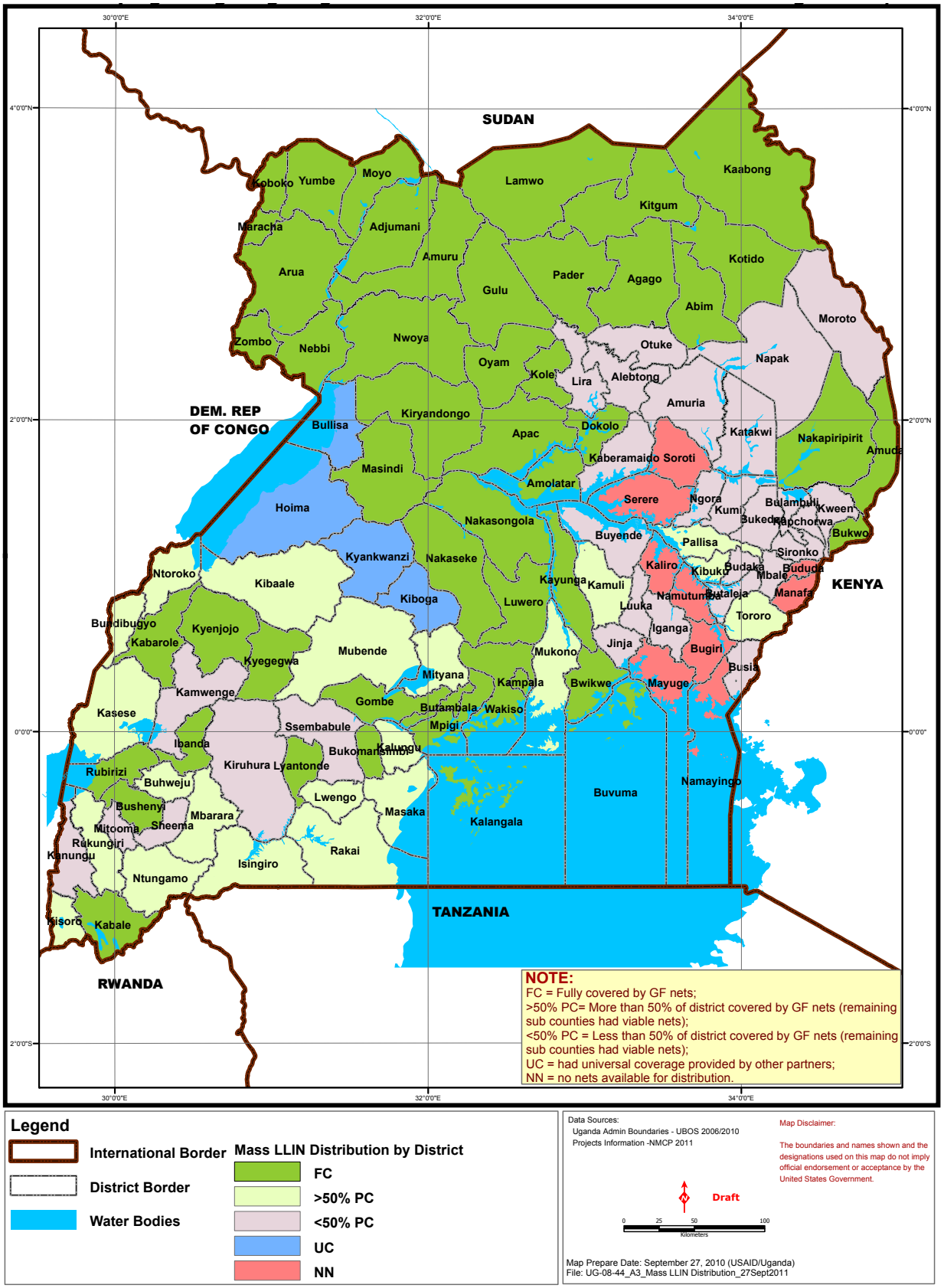
Ms. Emily Katarikawe
Executive Director, UHMG
Uganda

In Kampala, Friday 27th May 2011

Annex 3: A Map of Uganda showing the Geographical Coverage of Global Fund Round 7 Phase 1: Mass LLIN Distribution Campaign Targeting Pregnant Women and Children Under 5 Years of Age- 2010/11



Annex 4: Institutions and places visited during the field validation exercise

a) Central Institutions: AMREF, DFID, MACIS, MC, PACE, PMI, UHMG, MOH, Resource centre, Stop Malaria Project, UNICEF and WHO
b) Districts: Kabale, Mubende, Kyenjojo, Apac, Arua, Moroto, Tororo and Kampala

Annex 5: MPR Review Team

Name	Designation	Role	Institution of affiliation
Dr Adibaku Seraphine	Programme Manager	MPR Coordinator & Team Leader Programme Management	NMCP/MOH
Mr. Michael Okia	Senior Entomologist	Team Leader Vector Control	NMCP/MOH
Dr Okui Albert Peter	Senior Medical Officer	Team Leader Case management (Treatment)	NMCP/MOH
Mr Agaba Bosco	Laboratory Technologist	Team Leader Case management (Diagnosis)	NMCP/MOH
Dr. Myers Lugemwa	Senior Medical Officer	Team Leader Epidemiology, surveillance, M&E	NMCP/MOH
Mrs Mary S. Byangire	Senior Health Educationist	Team Leader BCC	NMCP/MOH
Dr Patrobas Mufubenga	Senior Medical Officer	Team Leader Malaria in Pregnancy	NMCP/MOH
Dr Denis Rubahika	Senior Medical Officer	Team Leader EPR	NMCP/MOH
Dr Sebisubi Fred	Principal Pharmacist	Team Leader PSM	Pharmacy Division/MOH
Ms Connie Balayo	Senior Environmental Health Officer		NMCP/MOH
Mr. Tom Byembabazi	Senior Vector Control Officer		NMCP/MOH
Ms Grace Edyegu	Senior Health Educator		NMCP/MOH
Dr Jane Nabakooza	Medical Officer		NMCP/MOH
Dr. Ebony Quinto	M&E Specialist		NMCP/MOH
Mr Kenneth Byoona	M&E Specialist		HP&E/MOH
Ms Mariam Nabukenya	BCC Technical Assistant		NMCP/MOH
Dr Patrick Bukoma	M&E Specialist		NMCP/MOH
Mr. Medard Rukari	LLINs Technical Assistant		NMCP/MOH
Ms Lucia Baguma	Programme Officer		NMCP/MOH
Dr Rwakimari JB	Chief of Party		Abt Ass inc.
Mr. Kojo Lokko	Chief of Party		JHU-CCP
Mr. Henry Semwanga	Deputy Director, Programmes		PACE
Mr Basil Tushabe	Executive Director		CDFU

Ms Caroline Asiimwe			FIND
Ms Agnes Suubi	Senior Operations Officer		Malaria Consortium (Ug.)
Mr. Abdul Shafiq	Director		Vestergaard Frandsen/ Nettshoppe
Mr. Kenneth Mulondo	Communication Specialist		SMP
Dr. Dennis Kakooza			PACE
Mr Ahimbisibwe James	Senior Lab Technologist		Lab Focal Person Masaka District
Mr Hassan Nasur	Medical Officer		NUMAT
Mr Lali Ziras William	LME- Laboratory Truck		Lab Officer, CPHL-MoH
Dr. Jane Achan	Pediatrician		Mulago Hospital
Dr. Nassanga	DHO		Mpigi District
Dr. Nambatya Grace	Director		NCR
Mr. Richard Onen-Ocan	National IRS Supervisor		Abt. Associates
Mr. Badru Mukasa	Senior Vector Control Officer		KCCA
Dr. Umar Ssekabira	Senior Medical Officer		IDI
Mr Muggaga Malimbo	Principal Biostastician		IDSR/MOH
Dr. Wamala	Senior Medical Officer		IDSR/MOH
Mr Otim F. Charles	Meteorologist		Meteorological Dept
Mr James Turyeimuka	Vector Control Officer		Kabale District
Mr Hassan Musobya	Procurement Officer		PDU
Ms Phellister Nakamya	M&E Specialist		SMP
Dr Gudoi Sam Siduda	Technical Advisor		SMP
Dr. Espilidon Tumukurate	Technical Advisor		UHMG
Dr. Ann Gassasira			UMSP
Dr. Denis Kintu	M&E Specialist		MACIS
Dr. Patrick Okello	Senior malaria Advisor		USAID
Dr. Gune	Senior malaria Advisor		USAID
Dr. Susie Nasr	Senior malaria Advisor		PMI
Dr. Flavia Mpanga			UNICEF
Mr. Nathan Natseri	Data Management		WHO
Dr. Juliet Bataringaya	Country Advisor/HSD		WHO
Dr. Muggaga Kaggwa	Country Advisor/NCD		WHO
Dr. Charles Katureebe	Country Advisor/Malaria		WHO
Dr. Miriam Nanyunja	Country Advisor/DPC		WHO
Dr. Andrew Balyeku		Internal Consultant	
Dr. Stephen Munga		External Reviewer	KEMRI/ Kenya
Ms. Pauline Mwamuleme		External Reviewer	NMCP/Zambia
Mr Khoti Gausi		External Reviewer	WHO/IST
Dr. John Govere		External Reviewer	WHO/IST
Dr. Peter Olumese		External Reviewer	WHO/HQrs