Additional funding for the President's Malaria Initiative has been allocated under a Continuing Resolution from Congress for the remainder of FY07. USAID Malaria Programs were allotted $248 million ($25 million above the President's 2007 request) to allow the Agency to expand its bilateral global malaria initiative activities from the current 3 countries to 7. Country programs will expand access to long-lasting insecticide treated bednets and indoor residual spraying, promote and support effective malaria treatment through the use of proven combination therapies; and increase prevention efforts targeted to pregnant women. With the additional funding FY 2007 Malaria Operational Plans (MOPs) will be updated. Revised MOPs will be posted soon.

PRESIDENT'S MALARIA INITIATIVE

UGANDA

Malaria Operational Plan (MOP)

FY 2007

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AED	Academy for Educational Development
ANC	antenatal clinic
AQ	amodiaquine
AS	artesunate
BCC	behavior change communication
cACT	community-based ACTs
CDC	Centers for Disease Control and Prevention
CDD	community drug distributors
CPHL	Central Public Health Laboratory
CQ	chloroquine
CSO	community service organizations
DDT	dichloro-diphenyl-trichloroethane
DFID	United Kingdom Department of International Development
DHS	Demographic and Health Survey
DOT	directly observed treatment
DSS	demographic surveillance system
EANMAT	East African Network for Monitoring Anti-malarial Treatment
EIR	entomological inoculation rate
ESR	epidemic surveillance and response
FANC	Focused antenatal care
FBOs	faith-based organizations
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOU	Government of Uganda
HBMF	Home Based Management of Fever
HFS	health facility survey
HMIS	health management information systems
HPC	Health Partners in Communication
HSSP	Health Sector Strategic Plan
ICCM	Inter-Agency Coordination Committee for Malaria
IDI	Infectious Disease Institute
IDP	internally displaced person
IEC	information, education and communication
IMCI	integrated management of childhood illnesses
IPT	intermittent preventive treatment
IRS	indoor residual spraying
ITN	insecticide-treated net
JHU/CCP	Johns Hopkins University Communications for Change Project
JICA	Japanese International Cooperation Agency
JSI	John Snow International
LLIN	long-lasting insecticide-treated net
MEMS	Monitoring and Evaluation Management Systems
MIP	malaria in pregnancy

MOH	Ministry of Health
NDA	National Drug Authority
NGO	non-governmental organization
NMCP	National Malaria Control Program
NMS	National Medical Stores
PEPFAR	President's Emergency Plan for HIV/AIDS Relief
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PMTCT	prevention of mother to child transmission
RBM	Roll Back Malaria
RDT	rapid diagnostic test
RH	Reproductive Health
RTI	Research Triangle Institute
SP	Sulfadoxine-Pyrimethamine
SWAp	sector-wide approach
UCSF	University of California, San Francisco
UDHS	Uganda Demographic and Health Survey
UgSPA	Uganda Service Provision Assessment
UHSBS	Uganda HIV Sero-Behavioral Survey
UMSP	Uganda Malaria Surveillance Project
UNBS	Uganda National Bureau of Standards
UNICEF	United Nations Childrens' Fund
UPHOLD	Uganda Program for Human and Holistic Development
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

EXECUTIVE SUMMARY

Uganda's leading cause of morbidity and mortality is malaria, which is endemic in 95% of the country. Estimates show that malaria accounts for about 25-40% of outpatient visits to health facilities and the annual number of deaths attributable to malaria ranges from 70,000 to 100,000. Children under five years of age are most affected by malaria and nearly half of hospital inpatient pediatric deaths are due to malaria.

Uganda has made progress in scaling-up malaria prevention and treatment activities. Responding to the reality that for most caretakers self-medication is the first treatment choice, Uganda has implemented its Home-base Management of Fever (HBMF) program. This has increased the number of children under five receiving malaria treatment within 24 hours of onset of fever by 50%. The Ministry of Health has also recently adopted artemisinin-based combination therapy (ACT) as the official treatment policy and introduced intermittent preventive treatment (IPTp) of malaria in pregnancy for use in some antenatal clinics (ANC). Household net ownership is now calculated at approximately 25%. The National Malaria Control Program (NMCP) is currently using indoor residual spraying (IRS) to prevent malaria in epidemic-prone districts.

The President's Malaria Initiative (PMI) will support existing NMCP strategies and will coordinate closely with international and national partners to complement their funding and efforts. To achieve the goal and targets of the PMI in Uganda, the following major activities will be supported in year two of the Initiative:

1. Distribution of free ITNs to vulnerable groups through ANC clinics, large-scale campaigns, and to net facilities where non-governmental organizations and faith-based organizations can subsidize sales of ITNs to the lower wealth quintiles as well as the sale of ITNs through the retail market;
2. Conduct IRS with effective insecticides in two epidemic-prone districts, a high transmission district and IDP camps in Northern Uganda;
3. Support ACT policy implementation and strengthening logistics and distribution systems to ensure that ACTs are available in health facilities;
4. Revitalize the national IPT plan by continuing to support and training private and NGO health workers; and
5. Involve the private sector/NGOs/FBOs in malaria control activities.

The PMI will include a strong monitoring and evaluation component to measure progress against project goals and targets, to identify problems in program implementation, to allow modifications to be made efficiently if and when they are needed, and to confirm that those modifications are having their desired effect. This plan will be coordinated with the NMCP, the GFATM, and other partners to standardize data collection and reporting.

This document presents a detailed one-year implementation plan for the second year of the PMI in Uganda. It briefly reviews the current status of malaria control policies and interventions in Uganda, identifies challenges and unmet needs if the targets of the PMI are to be achieved and provides a description of proposed year two activities under the PMI. The MOP was developed in cooperation and consultation with the National Malaria Control Program and other stakeholders.

THE PRESIDENT'S MALARIA INITIATIVE

In June 2005, the United States Government announced a new five-year, $1.2 billion initiative to rapidly scale-up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this Initiative is to reduce malaria-related mortality by 50%. This will be achieved by reaching 85% coverage of the most vulnerable groups; children under five years of age, pregnant women, and people living with HIV/AIDS, with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACT), indoor residual spraying (IRS), intermittent preventive treatment for malaria in pregnancy (IPTp) and long-lasting insecticide-treated nets (LLINs).

The Initiative began in 2006 in three countries, Angola, Tanzania and Uganda with a total budget of $30 million. Funding levels for the three countries will increase until 2008 and then will be maintained through 2010. In FY07, four additional countries were added including Malawi, Mozambique, Rwanda and Senegal with the total PMI budget increasing to $135 million dollars.

In implementing this Initiative, the United States Government is committed to working closely with host governments and within existing national malaria control strategies and plans. Efforts will be coordinated with other national and international partners, including the Global Funds to Fight AIDS, Tuberculosis, and Malaria (GFATM), United Nations Children's Fund (UNICEF), Roll Back Malaria (RBM), the World Bank Malaria Booster Program and non-governmental and private sector organizations to ensure that investments are complementary and RBM and Millennium Development Goals can be achieved.

MALARIA SITUATION IN UGANDA

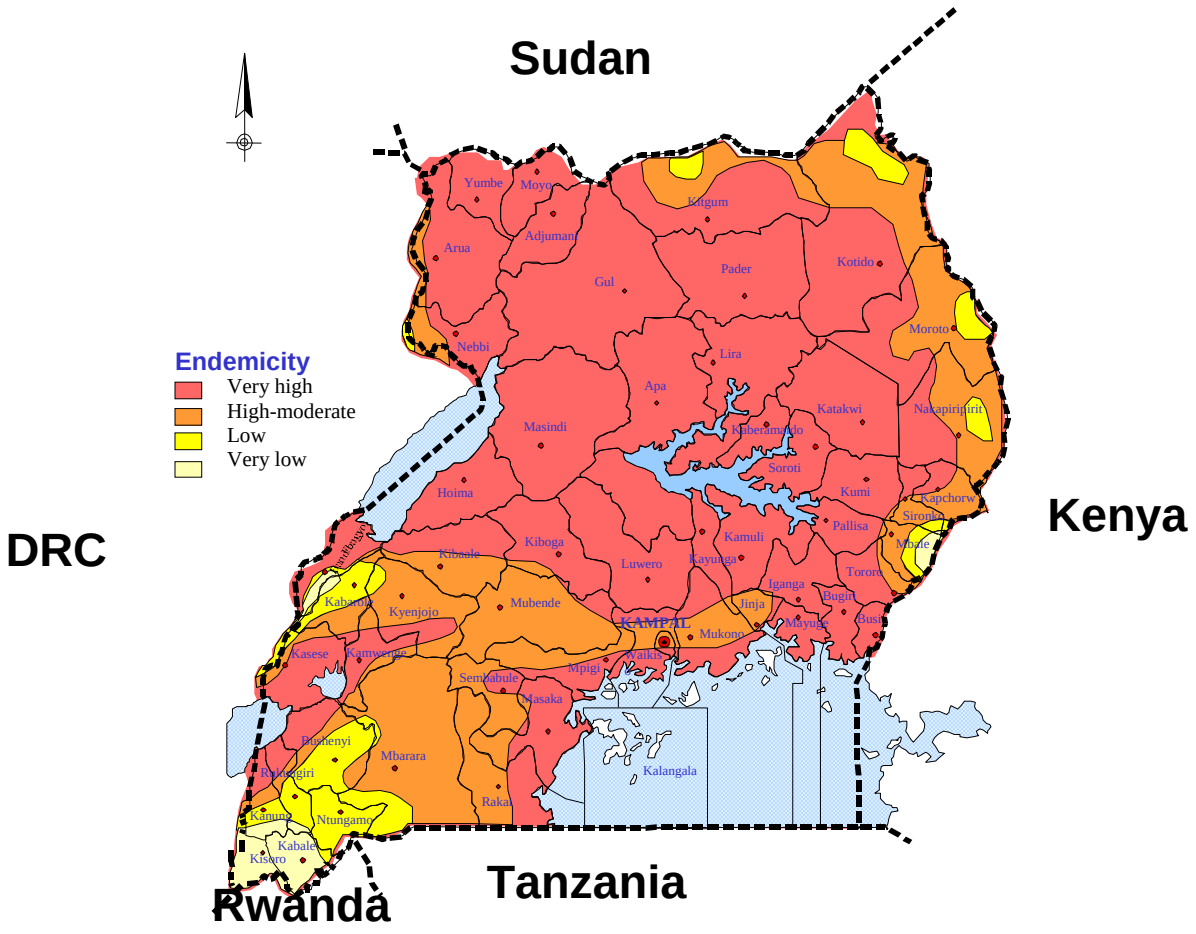
Epidemiology of Malaria in Uganda

Malaria is endemic in 95% of Uganda. The remaining 5% of epidemic-prone malaria transmission areas lie in the highlands of the southwest, midwest, and along the eastern border with Kenya and northeastern border of Sudan. In most parts of Uganda, temperature and rainfall are sufficient to allow a stable, year round (perennial) malaria transmission at high levels with relatively little seasonal variability. Only in the high altitude areas in the southwest, west and east is malaria transmission generally low, with more pronounced seasonality (June/July), and the occurrence of epidemics.

Clinically-diagnosed malaria is the leading cause of morbidity and mortality; it accounts for 25-40% of outpatient visits at health facilities, 20% of all hospital admissions and 9-14% of all hospital deaths. Nearly half of hospital in-patient deaths among children under five years of age are attributed to clinical malaria. A significant percentage of deaths occur at home and are not reported by the facility-based health information system. Current estimated annual number of deaths from malaria ranges from 70,000 to 110,000. The number of clinical malaria diagnoses reported by the public health services has been increasing in recent years, particularly for children under five. This may be attributable to an increase in resistance of the malaria parasite to the current malaria

treatment as well as increase in surveillance reports. The NMCP estimates that the total number of fever cases for all ages was approximately 65 million in 2004. Of these cases, approximately 12 million were treated in the public and not-for-profit sector.

MALARIA ENDEMICITY IN UGANDA



Status of Malaria Interventions and Health System Infrastructure

For the period 1999-2001, chloroquine (CQ) and sulfadoxine-pyrimethamine (SP) mono-therapy treatment failures had averaged 33% and 12% respectively.[1] In contrast, the combination of CQ/SP had an average failure rate of 7%. Therefore, at the end of 2000, the NMCP changed the first-line malaria treatment policy to CQ/SP. Treatment guidelines and other training and communication materials were updated, supplies of SP increased and all health staff in the public sector were trained on the new treatment. The launch of the policy took place in April 2002 and by 2003 practically all government health facilities were using CQ/SP. In contrast, adoption of the new policy was significantly slower in the private sector and by September 2002, only 15% of all shops had both, CQ and SP available.[2]

[1] children under 5 years, 14 day follow-up, average of all studies undertaken
[2] Availability of Antimalarials in the private Sector in Uganda, Commercial Market Strategies Project, October 2002

Resistance to SP as well as CQ/SP continued to rise and reached an average of 16% and 12% respectively during the period 2002-2004. At the same time, studies indicated excellent efficacy of ≥98% for ACTs, namely artesunate/amodiaquine (AS/AQ) and artemether/lumefantrine (AL) (brand name Coartem®). Based on these results, the Government of Uganda (GOU) changed the first-line treatment policy to artemether/lumefantrine and AS/AQ was named the alternative first-line treatment. Last year with the support of the GFATM Round Four grant, Uganda implemented this change nationally at the health facility level.

Although progress has been made, timely treatment of malaria remains a problem. The first treatment choice for more than two-thirds of caretakers is self-medication, with only a quarter of them seeking treatment at a health facility. To address this situation and to ensure that children under five receive appropriate treatment for malaria, in 2002 Uganda began implementing the Home Based Management of Fever (HBMF) program to complement the availability of free malaria treatment through public health facilities. This program is designed to put malaria treatment for young children into the hands of caregivers. As part of the HBMF program, community volunteers in districts nationwide (as of October 2005) distribute pre-packaged, age-specific, CQ/SP "Homapak" malaria treatment kits to mothers/caregivers of young children with instructions on proper use. A 2003 evaluation of the HBMF program found an increase from 7.3% in 2001 to 39.2% of children under five receiving treatment within 24 hours in the nine districts implementing the HBMF intervention at the time.[3] In April 2005, this figure increased to 66% of children receiving treatment within 24 hours of onset of fever in districts implementing HBMF.

Although the first-line treatment for malaria has changed to ACT, Uganda still uses a combination of CQ/SP in its HBMF program. The recrudescence rate varies broadly, ranging from 22% in Apac to 67% in Kanungu.[4] Issues around drug resistance have prompted the government of Uganda to plan a transition from CQ/SP to ACTs as part of the HBMF. Currently there is no evidence on how ACTs would best be implemented, how efficacious they are, and/or the costs of using them at the village level through a HBMF program. The MOH has begun implementation of community-based ACTs in four northern Uganda districts (Pader, Kitgum, Gulu and Kotido); however, until more is understood about community-based distribution of ACTs, the MOH will continue to use CQ/SP for HBMF in the remaining 76 districts of the country. In year one, the PMI supported operations research to examine these questions.

IPTp for the prevention of malaria in pregnancy is being implemented in all health facilities that offer antenatal care (ANC) services. According to the NMCP, approximately 34% of women attending ANC clinics receive two doses of IPTp.[5]

Household ownership of any type of net has increased over the past five years from 13.2% to 25.9%, and the proportion of children under five sleeping under a treated net has also increased to

[3] Fapohunda, B.M; Beth, A.P., et al (2004). The home based management of fever strategy in Uganda: survey report 2004. BASICS II/MOH/WHO/USAID, Kampala
[4] Bakyaita et al, AJTMH 2005.
[5] Achievement, Challenges and areas of Concern for National Malaria Control Programme for HSSP I, JB Rwakimari, April 2005.

about 15%. There remains a clear need to increase coverage of ITNs and long-lasting insecticide-treated nets (LLINs).[6]

In the past, IRS has only been implemented in selected district sub-counties on a limited scale and usually in response to large increases in numbers of clinical malaria cases. In 2006, the PMI supported IRS in the entire district of Kabale in southwestern Uganda with lambda-cyhalothrin. The NMCP plans to begin an IRS program targeting the highland districts at-risk of epidemic malaria using the GFATM Round Two Phase Two[7] grant funds. The NMCP also hopes to implement spraying in Apac district (the highest endemic area of Uganda) and in selected internally displaced persons (IDP) camps in 2007-2008.

Uganda has become a model for HIV/AIDS prevention treatment and care. Through the President's Emergency Plan for AIDS Relief (PEPFAR), the United States Government has worked with local partners to develop HIV/AIDS care and support for people living with HIV/AIDS (PLWHA). These palliative care projects provide malaria prevention and treatment through promotion of ITNs and treatment for this vulnerable population.

Government health sector

Within the formal government health sector, preventive and curative malaria interventions have been incorporated as part of the Minimum Health Care Package delivered at the primary health care level. Primary health care centers are responsible for the delivery of malaria services through integrated management of childhood illness (IMCI) and for mobilizing communities and other partners to address malaria at the household level. At the district level, primary duties include planning, resource allocation and management, as well as oversight of all facilities (both public, NGO and private) in the district. Districts are decentralized and are responsible for its respective health plans and budgets. At the central level, the NMCP supports implementation through policy formulation, standards setting and quality assurance, resource mobilization, capacity development and technical support, malaria epidemic control, and monitoring and evaluation.

NATIONAL MALARIA CONTROL PLAN

The Ministry of Health established the National Malaria Control Program (NMCP) in 1995. The third strategic plan for the period 2005/06-2009/10 has been finalized.

The NMCP goal is to control and prevent malaria morbidity and mortality so as to minimize related social ill effects and economic losses attributable to malaria in the country.

The overall objectives for the National Malaria Control Strategy 2005/06-2009/10 are:

- To go to scale nationally with a package of effective and appropriate core interventions that promote positive behaviour change and prevent and treat malaria; and
- To achieve rapid and sustainable high coverage levels for this intervention package.

[6] Uganda HIV Sero-Behavioral Survey (UHSBS), 2004/5
[7] It is not clear if Phase two of the Global Fund Round Two grant will be approved.

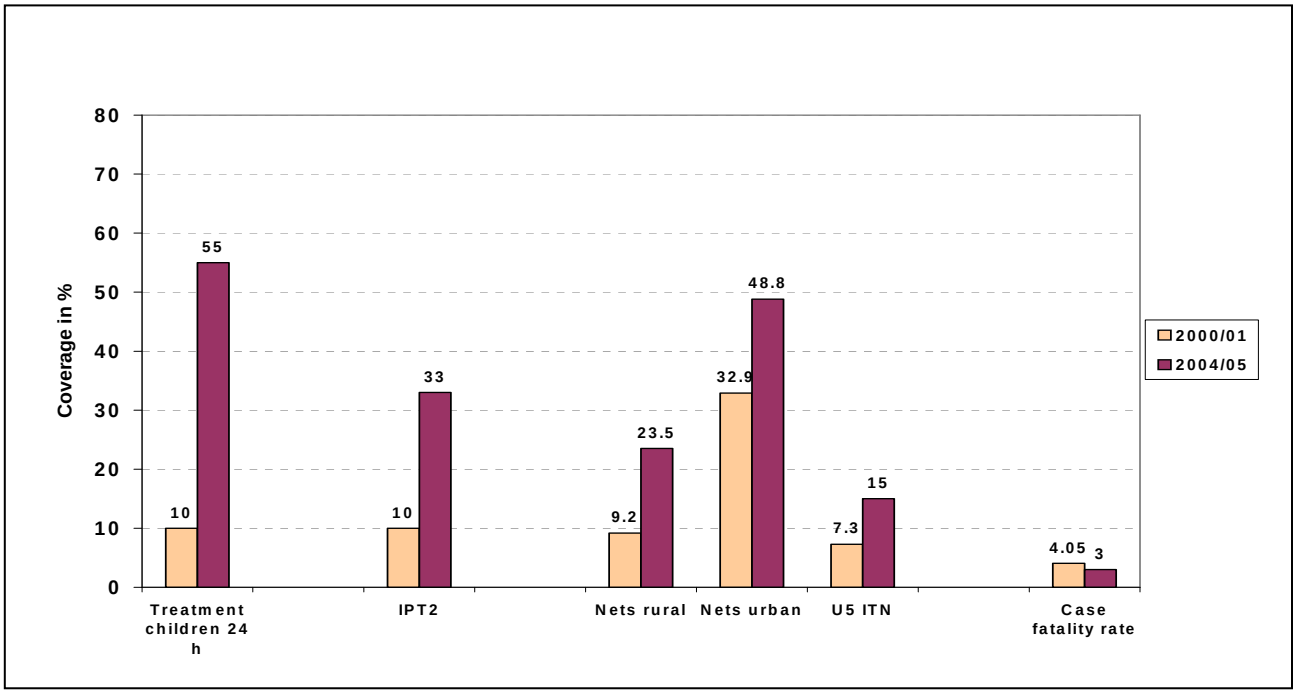
The core interventions include:

- Malaria prevention through ITNs with special emphasis on LLINs in highly-endemic areas;
- IRS with focus on low and epidemic-prone areas (prevention of malaria epidemics) and environmental management where this is feasible and effective;
- Universal access to ACT treatments and improved diagnosis as well as severe malaria management;
- Emphasis on treatment and prevention of malaria in pregnancy including IPTp;
- Intensive information, education and communication (IEC) efforts and social mobilization at all levels;
- Integration of malaria control into a balanced health system development with emphasis on human resource development; and
- Strong monitoring, evaluation, and operational research to monitor progress, evaluate impact, and continuously improve interventions.

Uganda has several strategy documents that support treatment and prevention of malaria including: Malaria in Pregnancy Control (2000); Home Based Management of Fever (2005); Policy and Strategy for Insecticide Treated Nets (2006); The Use of ACTs at the Community Level (Implementation Guidelines for the HBMF Strategy second edition: 2006); and Management of Uncomplicated Malaria, a Practical Guide for Health Workers, 3rd Edition, (2005), and the Policy and Strategy for Indoor Residual Spraying (2006).

In April 2005, the NMCP prepared a summary graph of results of the major malaria indicators, which are presented below.

National Malaria Indicator Coverage Rates for 2004-2005: Children under five years treated for fever within 24 hrs, IPT2, ITN by both urban and rural distribution.



The targets for 2010 written in HSSP II are to:

i) Reduce case fatality rates amongst malaria in-patients aged less than five years from 4% in 2004 to 2% in 2010,
ii) Increase the proportion of children aged less than five years getting correct treatment within 24 hours of onset of symptoms from 55% to 80%,
iii) Increase the proportion of pregnant women attending ANC who have completed IPT 2 from 34% in 2004 to 80% in 2010,
iv) Increase the proportion of households having at least one ITN from 15 % to 70%, and
v) Increase the proportion of targeted structures for IRS in epidemic areas from 0% to 80%.

Coordinating mechanisms

Inter-Agency Coordination Committee for Malaria (ICCM): The ICCM provides a forum at the national level for all stakeholders to coordinate malaria control plans and activities as well as monitor progress against objectives and targets. Members include the major donors (USAID, United Kingdom Department for International Development (DfID), multilaterals (WHO, UNICEF), NGOs and FBOs, and the Ministry of Health representatives and the private sector. Four technical working groups have been established as part of the ICCM: vector control/ITNs; malaria case management (including malaria in pregnancy); IEC; and monitoring, evaluation and research.

MAJOR PARTNERS IN MALARIA CONTROL

In addition to government resources and funds channeled by international partners through budget support as part of the health sector wide approach (SWAp), major direct contributors to the funding

of the national malaria control strategy include multilaterals including WHO and UNICEF as well as several bilateral organizations.

Uganda has received two GFATM grants to support malaria control and prevention programs. Phase One of the Round Two GFATM grant for $23 million contributes to scaling-up of HBMF to all districts in the country, and organization of a first round of free ITN distribution and net re-treatment. This round also provided 1.8 million ITNs that are earmarked for free distribution to vulnerable populations beginning in December 2006. The GOU has requested support for Round Two, Phase Two that would provide funding for IRS in epidemic-prone areas but this is dependent on the successful completion of Round Two, Phase One. Due to problems with the implementation of the Phase One portion of the grant, particularly the procurement of the LLINs, it is unclear if Phase Two will be approved.

The $66 million Phase One of the Round Four GFATM grant has allowed Uganda to introduce ACTs at health facility levels and provides a sustained ACT supply until 2009. This grant initially faced problems in early September 2005, resulting in the temporary suspension of the implementation of these grants, pending reorganization of the Project Management Unit. The Government has taken concrete actions to resolve this issue; as of 11 November 2005, the suspension was lifted and the GOU is moving forward with next steps in GFATM grant implementation. In spring of 2006, the first order of 15.5 million ACTs arrived and was used for facility-based distribution.

USG partners and agencies in Uganda

USAID/Uganda has a long-standing malaria program in the country, and has also been the largest bilateral donor for malaria in Uganda since 2000. USAID/Uganda's implementing partners in malaria activities include John Snow International (JSI), Johns Hopkins University Communications for Change Project (JHU/CCP), Netmark*plus* Project (AED), the Malaria and Childhood Illness Secretariat hosted by AMREF and in the recent past, Population Services International and Research Triangle Institute (RTI). Through its contract for the UPHOLD project via JSI and the AFFORD project via JHU/CCP, USAID/Uganda also has sub-contractual relationships to the Malaria Consortium. New partnerships with NGOs/FBOs are being encouraged in 2007. In 2000, CDC and USAID began a collaborative activity to strengthen technical capacity within the NMCP. CDC has also supported U.S.-based organizations that work with Makerere University to conduct operational research and to strengthen the capacity.

Other donors and international partners

DfID is one of the major donors contributing to malaria programs and works largely through the SWAp. The Development Cooperation of Ireland supports also malaria programs through the Malaria Consortium. Although the German Development Agency has previously contributed to research and implementation work at the district level, current support remains limited. WHO has been an active participant in supporting Uganda's malaria control efforts. UNICEF contributes to some ongoing activities related to malaria, although recently this has not been a major focus for

UNICEF in Uganda. World Bank funding is available to the government for malaria control within their International Development Assistance.

GOALS AND TARGETS OF PRESIDENT'S MALARIA INITIATIVE

The goal of the PMI is to reduce malaria-related mortality by 50% by the end of 2010.

By the end of 2010, the PMI will assist Uganda in achieving the following targets among at-risk populations for malaria:

1. >90% of households with a pregnant woman and/or children under five will own at least one ITN;
2. 85% of children under five will have slept under an ITN the previous night;
3. 85% of households will own at least one ITN;
4. 85% of children under five with suspected malaria have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of the onset of their symptoms;
5. 85% of pregnant women will have slept under an ITN the previous night;
6. 85% of pregnant women will have received two or more doses of IPT during their pregnancies;
7. 85% of houses targeted for IRS will have been sprayed; and
8. 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months

EXPECTED RESULTS– YEAR TWO

These results are based on projection that all partners (GFATM, UNICEF, WHO, JICA etc) are able to fully contribute to the plan

Indicator	Baseline	Year 2 target (March 2008)
Proportion of pregnant women who receive 2 or more doses of IPT during their pregnancy	33%	45%
Proportion of children under five years of age sleeping under an ITN the previous night	15%	60%
Proportion of pregnant women sleeping under an ITN the previous night	12%	45%
% of households that own at least one ITN	29%	45%
% of houses targeted for indoor residual spraying (IRS) that have been sprayed	0%	85%
% of districts nationwide where malaria treatment with ACTs is implemented in health facilities	0%	85%
% of children under five with suspected malaria attending a government health facility receive treatment with an ACT	0%	40%
% of children receiving community treatment of malaria (children under five with fever who receive treatment within 24 hours of onset of symptoms)	60%	60%

INTERVENTIONS - PREVENTION

INDOOR RESIDUAL SPRAYING

Current status

The Ministry of Health/ NMCP Uganda would like to implement IRS for malaria control to complement the scale-up and use of ITNs. The GOU is developing a document, *Policy and Strategy for Indoor Residual Spraying*, which recommends routine IRS in 15 districts. These 15 districts have 1 – 1.5 million households and represent approximately 20% of the total population in Uganda. Funding for IRS in these fifteen districts was requested under the GFATM Round Two, Phase Two grant. The NMCP is also interested in using IRS in highly endemic areas. Since the IRS program is new to Uganda, the future strategic directions and the partnerships are still being explored and lessons are still being learned from first spraying in Kabale with ICON-WP.

The major malaria vectors in Uganda, *Anopheles gambiae s.l.* and *An. Funestus,* are both highly endophagic and endophilic (feed and rest indoors) making IRS a viable strategy. Existing data shows that the vectors are susceptible to deltamethrin, permethrin and dichloro-diphenyl-trichloroethane (DDT). While DDT lasts longer,[8] concerns about safety and leakages into the agricultural sector have prompted the NMCP to use synthetic pyrethroid formulations (Lambda-cyhalothrin, deltamethrin and alpha-cypermethrin) in 10% WP (wetable powder). Lambda-cyhalothrin is currently registered in Uganda for use with IRS, per WHO recommendation.

In the past, malaria vector control through IRS has been used effectively for epidemic control and eradication efforts in Uganda. Under the Malaria Eradication Program between 1959 and 1963, elimination of malaria was nearly achieved in the southwestern low transmission area in Uganda using DDT. *Anopheles funestus* was practically eliminated while *An. gambiae sensu latu (s.l.)* densities were dramatically reduced resulting in a marked reduction in malaria-related hospital mortality and hospital admissions, and outpatient attendance.

In recent years, a series of malaria epidemics have occurred in highland areas of Uganda and some have been controlled using IRS. Between 1992-and 1998, epidemics occurred in Rukungiri, Kabale, and Kapchorwa. In 1998, most of the low endemicity areas and highland districts in the southwest experienced a severe epidemic following the *El Nino* rains, resulting in high mortality and serious socio-economic consequences. Some of these epidemics were partially controlled using IRS with ICON™ 10% WP ; however, the program felt that the magnitude and impact of these epidemics could have been minimized if the epidemics had been forecasted and more extensive control measures had been used. In 2001, targeted IRS with lambda cyhalothrin (ICON™ 10% WP) successfully controlled a malaria epidemic in Kabale and in June and July of 2005, a World Vision-supported scattered IRS program controlled another epidemic in the sub-county Rukiga of Kabale district.

[8] Evidence from South Africa indicates that the effective lifetime of pyrethroids on mud walls is significantly shorter than that of DDT

As part of its expansion of IRS, the MOH/NMCP is interested in using IRS for controlling malaria in IDP camps. As a result of a meeting to review malaria control and case management in northern Uganda (Kitgum, 16th – 17th March 2006), the MOH conducted rapid assessment of the feasibility and cost implications of IRS use in IDP camps, accessibility of camps for IRS applications, availability of water for IRS, average surface area of households in each IDP camps and to document previous IRS experiences and the practice of re-plastering structures in IDP camps. This assessment found that IRS is feasible in camps where the security is not a major hindrance, the household structures are suitable for IRS, and IRS is likely to be accepted by the communities.

Summary findings of the feasibility study on IRS in malaria control in IDP camps of Northern Uganda

District	Camps surveyed (Total)	Structures	Population	Est. house surface area (M^2)	No of water points	Security situation (good/ fair/poor)	No of camps previously sprayed
Apac	19 (19)	86,374	171,458	1,718,842	85	2/13/4	7
Gulu	36 (54)	207,501	579,745	5,146,024	334	9/21/6	3
Kitugum	19 (24)	129,816	345,502	2,323,706	309	4/15/0	3
Lira	43 (43)	248,520	600,537	5,442,588	332	24/19/0	5
Pader	23 (57)	164,469	340,689	4,588,685	250	2/20/1	5

Reference: Feasibility of conducting indoor residual spraying (IRS) for malaria control in IDP camps of Northern Uganda; A draft report of a rapid assessment. 7th -30th April, 2006 WHO/MOH.

The NMCP also would like to use IRS in one highly endemic district. The MOH/NMCP strongly proposes to conduct IRS in Apac district, the highest transmission area (EIR=1,564) in Uganda, with a follow-up ITN campaign to sustain the gained achievements. It is hoped that this approach will bring down the vector density and reduce the entomologic inoculation rate (EIR). In combination with ITNs and case treatment both at facility and community levels, IRS should reduce further transmission of the disease.

Progress to date

Under the PMI year one funding, the PMI supported an IRS campaign in the epidemic-prone southwest district of Kabale from June-August 2006. The campaign was highly successful, with ≥85% coverage of houses and population protected. 100,000 households were sprayed and total population of 480,000 (98%) persons was covered. Because of the high coverage and public acceptance for spraying, the NMCP is keen on conducting larger-scale, well-targeted, timely IRS campaigns in both unstable and stable transmission areas. Morbidity and mortality data on fever and lab diagnosed malaria will be followed closely over the next few months to evaluate further the impact of IRS.

Proposed Year 2 activities

PMI will support the NMCP's efforts to implement an evidence-based targeted, cost-effective and sustainable IRS program. In year two, the NMCP needs support for further expansion and strengthening of the IRS program in higher transmission areas of the southwest epidemic-prone districts (Kabale and Kanugu), endemic districts (Apac district), and areas of complex emergency situations (i.e. IDP camps).

The implementation of this approach will require close entomologic monitoring and evaluation as described in the Monitoring and Evaluation section. For Apac, specifically, a sero-prevalence rate in children under five could be established both before and after the implementation phases. Strengthening of malaria surveillance indicators and diagnostic capacity should be done prior to IRS in all districts. At least one sentinel site in each district being sprayed should be established to ensure evaluation of all malaria indicators at a facility level.

The MOH has requested assistance to develop a Ugandan IRS program capable of training, organizing, and supporting the 'phased-in' IRS expansion to the 15 surrounding districts over the next four years. Specific assistance will be provided to purchase insecticide, spray pumps, spare parts, personal protection equipments, rent vehicles, and storage facilities. The NMCP also requests assistance for IRS planning, personnel management, environmental and human health safety and logistics management including forecasting and procurement of insecticide, on-the-job training of spray personnel, and IRS data management including the mapping and stratification of areas for IRS.

The use of ICON-CS, a long-acting pyrethroid, in year two IRS program has been proposed. It is expected that ICON-CS will receive WHOPES approval in November 2006. Since ICON-WP was approved through the PERSUAP in 2006, it is not necessary to repeat the same for ICON-CS since the chemical is identical. However, Uganda National Environmental Management Authority still needs to approve ICON-CS and this approval is expected by the end of 2006. There has been MOH and GOU interest in using DDT for IRS in Uganda; however, this issue is very controversial. If the government and relevant agencies approve its use in the country, the PMI will support the development of a PERSUAP for DDT and explore its use for IRS.

In summary, specific activities include: (1) strengthening of human resource capacity for the IRS teams at all levels through on-the-job training with a contractor hired to conduct the year two IRS activity as well as input from technical partners with expertise in specific areas (quality assurance, logistics, procurement, certification, IEC); (2) comprehensive environmental impact assessments for DDT; (3) strengthening and upgrading of existing surveillance activities designed to track clinical and diagnostic data and predict epidemics; and (4) technical support from appropriate technical partners to the M&E unit of NMCP for vector-insecticide interactions assessments (resistance, repellency, outdoor biting) (Please refer to monitoring and evaluation section).

Proposed year two activities *($5,780,000)*:

1. *Support second round of IRS in Kabale District:* The PMI will assist the NMCP and its partners with second round of IRS in 'high risk' villages in Kabale District covering 50% of households described in the MOH briefing document "Kabale District - Parishes most affected by malaria" using lambda cyhalothrin (*$780,000*).

2. *Support one round of IRS in Kanungu District:* The PMI will conduct one round of spraying in this highland area, which has both high transmission and epidemic-prone transmission. It is estimated that 70% of households in the district fall within a malaria risk zone (*$1,500,000*).

3. *Support one round of IRS in Apac District followed by house-to-house ITN distribution and formative evaluation:* As an innovative approach PMI will assist NMCP/MOH to conduct one round of IRS in the highly endemic Apac district in northern Uganda followed by house-to-house net distribution as a sustainable measure. Formative evaluation of this approach will be on-going throughout the following two years (*$2,250,000*).

4. *Support one round of spraying in selected IDP camps in Northern Uganda:* The PMI will support one round of spraying in selected IDP camps in Pader, Kitgum and Gulu, the three main malarious and conflict districts of northern Uganda (*1,000,000*).

5. *Support the MOH in IEC/BCC/community mobilization:* Activities will include development of an IEC/BCC malaria module specific for IRS and campaigns to mobilize and educate communities on what IRS is, its benefits and risks, and proper procedures for safety and community participation (*$250,000*).

Note: Under new demarcation of districts in Uganda , PMI will conduct IRS in nine districts. Kabale, Kanungu, Apac, (now 3 districts), Gulu (now 2 disticts) Kitgum and Pader.

INSECTICIDE-TREATED NETS

Current Status

Current coverage of children under five years of age and pregnant women who sleep under ITNs remains low. Only 39% of under fives and pregnant women sleep under ITNs, and national household coverage (households owning one or more nets) is 26%.[9] Geographically, coverage varies widely and districts having a higher nuisance mosquito problem have an increased use of ITNs. Correct and consistent use of LLINs by the target population continues to be poor; many people do not use their ITNs except during the rainy season.

To rapidly scale-up ITN coverage, Uganda is applying a mixed model approach to increase LLINs availablity: distribution of free ITNs to vulnerable groups through ANC clinics and NGOS, large-scale campaigns to targeted populations, and the sale of ITNs through the retail market. This mixed model is complemented by annual net retreatment campaigns to ensure that ITNs maintain their effectiveness.

Through its Round Two GFATM grant, the NMCP is rapidly expanding free distribution of ITNs. In late 2006 through early 2007, the GOU will distribute 1.8 million free nets to vulnerable populations in a series of four regional campaigns. Given that these LLINs may not cover all the intended beneficiaries (6,800,000 children under five years of age and pregnant women or 26% of the target population), the programme will target an average of two to three sub-counties per district known to have the highest prevalence of malaria cases. Several NGOs (including PSI, AFFORD, MSI and others) have been contracted to facilitate the distribution of the LLINs with the help of community drug distributors (CDDs) and through ANCs. It is expected that this campaign will increase national net ownership (number of households with at least one ITN) to approximately

[9] This net ownership is a 2004 estimate. In 2006, a DHS was conducted which is expected to provide more accurate statistics on net ownership and net coverage.

39%.

Summary of GFATM LLIN Distribution plan

Campaign	Shipment	No. LLINs	Districts
December 2006	1st and 2nd	253,920	Bugiri, Iganga, Palisa, Tororo, Busia, Jinja, Kamuli, Mayuge
January 2007	3rd	563,040	Mbale, Sironko, Kapchorwa, Mukono, Kayunga, Wakiso, Mpigi, Kampala, Luwero, Mubende, Masaka, Sembabule, Kalangala, Nakasongola, Rakai, Kumi, Kaberamaido, Katakwi, Soroti, Moroto, Kotido, Nakapiripirit
February 2007	4th	563,040	Kabarole, Masindi, Hoima, Kiboga, Kibaale, Kasese, Bundibugyo, Kamwenge, Kyenjojo, Arua, Nebbi, Yumbe, Adjumani, Moyo
March 2007	5th	420,000	Rukungiri, Kanungu, Kabale, Kisoro, Ntungamo, Mbarara, Bushenyi, Gulu, Pader, Kitgum, Apac, Lira
Total		**1,800,000**	

Millennium Promise has approached PMI/Uganda to provide $2 million in additional free ITNs (approximately 350,000 LLINs) for distribution to PMI target populations to supplement the GFATM distribution described above. Negotiations with this donor and the PMI regarding the terms of the donation and the details of the potential partnership are still underway.

While mass campaigns can rapidly scale-up net ownership and effectively target vulnerable populations, Uganda wants to ensure that the private sector market for both subsidized and unsubsidized ITNs remains vibrant and viable to ensure a sustainable supply of LLINs. The country has created demand for highly subsidized ITNs in the commercial sector. Currently, the commercial for-profit sector sells approximately 500,000 ITNs per year in urban centers, such as Kampala, and LLINs comprise 60% of nets sold by these partners. In areas where the population possesses a reasonable income level and ITN commercial viability is demonstrable, subsidized and socially-marketed ITNs are being used to encourage the commercial sector to enter the market. As a result of this approach, the number of private ITN distributors in Uganda has risen from one to eight over the last five years.

As the private sector net market has grown, so has the availability of inexpensive, substandard, un-treated nets. These nets are much cheaper than LLINs but they are un-treated, of poor quality, and less effective. As of now, the GOU has no means to ensure the quality of these nets and to regulate their sale. The National Bureau of Standards, the agency with the mandate to perform these quality control checks, currently does not have the capacity to regulate this market. These substandard nets are a threat to the private sector net market and the scale-up of ITNs nationally.

Considering that many untreated nets have already been distributed, it is important that these nets are regularly retreated with an insecticide (ideally a long-lasting insecticide) to improve their efficacy against malaria. The government policy regarding net re-treatment is the provision of this service free to the end user, including in places where commercial distribution is occurring. Since 2004, an annual retreatment campaign has occurred in 29 districts, covering about one-third of the

existing non-ITN nets. To date, the re-treatment campaigns have not used long-lasting retreatment kits but the government plans to use KO Tab 1,2,3® once it receives WHOPES approval.

In 2005-2007, it is estimated that between PMI-funded nets, GFATM-funded nets, and contributions of other donors, approximately 3.6 million ITNs were distributed in Uganda, bringing the total number of ITNs in the country to approximately 4.8 million. This means that roughly 45% of household should have two nets.[10] For 85% of households to own two ITNs, a minimum of 4.5 million additional ITNs are needed

Number of ITNs distributed/retreated in Uganda 2005-2006	
Donor	**Amount**
GF RD 2	1,800,000
PMI	668,000
UNICEF	70,000
Private Sector market	434,217
Nets retreated	600,000
Total	**3,572,217**

PMI Progress to date

Through the UPHOLD and AFFORD projects, the PMI distributed 374,000 free LLINs in IDP camps in the North with the aim of achieving 85% coverage of the pregnant women and children under five. Of these 210, 450 LLINs were distributed to the target populations in IDP camps in nine districts (Gulu, Kitgum, Pader, Katdkwi, Mubende, Bushenyi, Tumungiri, Mayuge, and Bugiri) through the community drug distributors, while 49,550 were targeted to populations living in the conflict districts but not in the IDP camps. The remaining 114,000 LLINs, which are a combination of UNICEF-donated nets and PMI-supported LLINs, were distributed through ANC clinics in Lira, Kitgum, Apac, Gulu and Pader to pregnant women.

Through March of 2007, the AFFORD project, with support from PMI, will expand this ANC service delivery system to all 15 conflict districts and will distribute an additional 264,000 LLINs to pregnant women and children under-five. This distribution will be combined with communication and behavior change activities to ensure that the ITNs are used correctly and consistently.

Additionally, the PMI is developing a virtual net facility to expand access to free LLINs nationally. This LLIN net facility will allow NGOs and FBOs access to free PMI LLINs, which they can in turn distribute free of charge to vulnerable populations in the communities where they work. The NGOs that receive the free nets are also receiving training on proper LLIN usage and distribution, health education strategies, follow up and leakage prevention. Approximately 100,000 LLINs will be distributed through this system by March 2007.

To reduce the number of un-treated LLINs in Uganda, the PMI supported a net-retreatment campaign in 27 districts in 2006. These districts were targeted because of their high burden of malaria and low ITN coverage. This campaign is retreating 600,000 nets using a conventional net re-treatment kit and will benefit a population of approximately 1.2 million.

[10] It is estimated that there are approximately 5.6 million households in Uganda.

Finally, the PMI continues to support the private sector net market in Uganda through the Netmark*plus* project which is working to create demand and ensure a consistent supply of ITNs. To create demand, Netmark*plus* has supported educational cartoon advertisements for newspapers and billboards as well as in-store promotions to encourage net use. On the supply side, Netmark*plus* has worked to increase the number of LLINs distributors and sellers in the country. Currently, there are over 1164 LLIN/ITN outlets in the country. Between October 2005 and June 2006, 434,217 nets were sold through the private sector and over 60% of these were LLINs.

Proposed year two activities *($6,025,000):*

1. Procure and distribute free LLINs through ANC clinics and the LLIN net facility: This will continue the LLIN distribution activities that began in FY06 which used ANC clinics to target pregnant women. The PMI will also provided free LLINs to community-based NGOs and FBO to allow then to distribute nets to pregnant women and children under five *($3,150,000*).

2. Partnership with new donor to distribute LLIN in selected districts as a follow up to GFATM net distribution campaign: The PMI will work with another donor to distribute its $2 million donation of LLINs to PMI target populations. These LLINs will be distributed as a follow-up to the four regional campaigns planned for the distribution of the LLINs supported through the Global Fund in the districts with low net coverage and high burden of malaria. The PMI will partner with this program by funding the distribution and IEC costs, as well as by providing an additional 100,000 LLINs for the campaign (*$1,100,000*).

3. Continue an annual ITN re-treatment: The PMI will support the re-treatment of existing nets in 29 selected districts with a population of 10.8 million people in 2.2 million households. The previous campaign retreated approximately 74% of existing nets. The launch date for this follow-up re-treatment campaign is January/March 2007 in order to ensure continued efficacy of these ITNs. Approximately 715,000 nets will be retreated. If KO Tab 1,2,3® is WHOPES approved, it is expected that it will be used. The campaign will be accompanied by an IEC campaign (*$700,000*).

4. Procure and distribute subsidized nets through the private sector (35,000 nets) The PMI will support the subsidized net market by providing 35,000 LLINs for sale in the private sector. These LLINs will receive a $3 subsidy and will help generate demand for LLINs and increase availability of LLINs when the campaign distributions are complete (*$250,000*).

5. Support of the private sector for ITNs and monitoring net distribution: PMI will continue to support the development of the private sector net market and implement a program to expand ITN distribution to open markets in rural and peri-urban areas targeting vulnerable populations (e.g. pregnant women and children under five). Specifically support will focus on the continued communication strategy with a particular focus on encouraging the purchase of LLINs or retreating existing nets, the introduction of new LLIN brands, and the development of in-country net manufacturing capacity (*$550,000*).

6. Support Ugandan National Bureau of Standard (UNBS) to improve its capacity to monitor net quality: The PMI will assist Ugandan National Bureau of Standard to improve its capacity to standardize nets, ITNs and netting material that is used to produce mosquito nets and to monitor the

quality of those ITNs. This will includes provision of equipment, setting standards and guidelines and training of relevant staff (*$75,000*).

7. *Evaluation of net usage and identification of mechanisms to increase coverage rates:* There are concerns that the LLINs are not being retained or correctly and consistently used by the target population. This public health evaluation will determine the current usage practices and will result in better usage at the household (*$100,000*).

8. Continue IEC on correct and consistent use of LLINs: The PMI will continue to support behavior change at community level and mass media activities to ensure that the LLINs are correctly and consistently used (*$100,000*).

INTERMITTENT PREVENTIVE TREATMENT

Current status

In 1998, IPTp for pregnant women was adopted as national policy and it was recommended that all pregnant women should receive two doses of SP after the first trimester as part of the MOH's focused-antenatal care package (FANC). The MOH advises pregnant women who are having a normal pregnancy to make four visits to the ANC clinic for FANC prior to delivery. The 2004 NMCP report on malaria in pregnancy activities showed that approximately 95% of pregnant women in Uganda attended ANC at least once during their pregnancy. Of those women, 80% returned for a second visit. Very few women attend the recommended four times; 60% of women deliver at home.

At the national level within the NMCP, malaria in pregnancy activities are implemented jointly with the Reproductive Health Unit (RH). The RH and NMCP are jointly responsible for the implementation of the program through training, support supervision, monitoring and evaluation, operational research, and provision of IPT services at health facilities and in the community.

Although IPTp has been the policy for eight years, its scale-up has not been national. IPTp coverage varies by different districts ranging from 10% to 50%, with a national average of IPT_2 (two doses of IPT during pregnancy) of 35%. Although a second visit prior to delivery is common, there are several reasons that contribute to the low second dose of IPTp: 1) intermittent drug supply with frequent stock outs of SP; 2) lack of sufficient personnel to keep accurate records; 3) women preferentially attend ANC clinics of perceived higher quality resulting in an overburdened system and thereby a reduction in services provided; 4) poor morale among the overwhelmed staff; 5) pregnant women present for the first time too late to take a second dose of SP; 6) lack of basic clean drinking water and cups for direct observation of IPTp; and 7) a perception that taking drugs during pregnancy may cause harm to the baby. The table below shows that the majority of women in at least two areas attend ANC for the first time in the second trimester.

Proportion of pregnant women in Banumka and Kapeeka sub-counties (N=768) and the time of first presentation at the ANC, National Malaria Control Program, 2006.

First presentation to ANC	Sub-county Banumka	Sub-county Kapeeka
1st trimester	9%	8.5%
2nd trimester	90%	88%
3rd trimester	1.5%	3%

To increase the uptake of IPTp, the NMCP has considered developing a directly observed treatment approach for IPTp at the community level that would be integrated with the HBMF and other community-based interventions. This approach would need to be sensitive to the complex cultural attitudes of women during pregnancy and should avoid acting as a deterrent to women going to the ANC clinic. The NMCP is exploring different options to implement such an approach.

In the conflict areas of northern Uganda, the MOH has also expressed interest in integrating IPTp into the existing prevention of mother to child transmission (PMTCT) of HIV/AIDS efforts. All those living within the camps will be sensitized on this strategy and mothers will be encouraged to attend ANCs. Support will be provided to the RH and NMCP to work with the data collection unit of MOH to improve data collection process and analysis of IPTp uptake at the district level. Feedback will be given to each district accordingly.

PMI Progress to date:

In 2006, PMI facilitated a national review of the current implementation of IPTp involving the NMCP, the RH, all stakeholders, and NGOs. A multi-disciplinary technical team was established to review and adapt a FANC training manual as well as the facilitator's guide. The team subsequently wrote an implementation plan for the re-training of health workers.

To create demand for IPTp by pregnant women, advocacy using appropriate IEC materials is being development for use at ANC clinic and community level. This approach will encourage pregnant women to attend ANC early and these messages are intended to expel the notion of SP being too strong of a medicine to use during pregnancy. Advocacy will be headed by the district health education units in collaboration with the NMCP/RH utilizing all available media outlets.

Proposed year two activities *($540,000)*:

1. *Conduct national FANC training for private sector and NGO sector health workers on IPTp:* Support will be provided for training private sector and NGOs who play a role in the delivery of IPTp services at community level (*$130,000*).

2. *IPTp through ANC clinics in Northern Uganda:* This will include advocacy, training, logistical support, supportive supervision, and other areas relevant to IPTp strategy. All those living within the camps will be sensitized about this strategy and pregnant women will be encouraged to attend ANC (*$130,000*).

3. *Integrate IPTp with PMTCT/MCH:* IPTp will be integrated into PMTCT efforts and health workers will be orientated at all levels. The support will be provided for implementation of this approach in existing PMTCT/MCH clinics, including supportive supervision and monitoring and evaluation of the approach (*$130,000*).

4. *Continue to support for the MOH IEC district advocacy plan:* The health education unit of selected districts, in collaboration with the NMCP, will conduct community level advocacy on IPTp to encourage pregnant mothers to early uptake and complete IPTp doses (*$150,000*).

INTERVENTIONS – EPIDEMIC RESPONSE

EPIDEMIC SURVEILLENCE AND RESPONSE

Current Status

Epidemic malaria and seasonal transmission of malaria occurs in districts in the highland regions of southwest and eastern Uganda. If the number of malaria cases exceeds the expected seasonal transmission threshold, it will be necessary to investigate the epidemic. While the NMCP includes early detection and rapid containment of malaria epidemics as one of its objectives, existing systems for epidemic detection and response are generally weak and poorly organized. There is a threshold established for each epidemic-prone area; however, the sensitivity of this threshold is unknown. Districts report health information, including cases and deaths due to clinical malaria, on a weekly basis through the routine HMIS system. However, compilation of data, analysis and availability of information for decision making is generally delayed. The Central Public Health Laboratories also feed information into the MOH surveillance systems. This results at times in high reported rates of malaria from districts which are never investigated. Without investigation, an appropriate response cannot be mounted and epidemics may not be contained quickly and effectively.

Although guidelines exist for epidemic response and containment, there tends to be inconsistency in response due to some of the following factors: 1) reporting of increased numbers of cases may be slow in reaching the district and national level; 2) analysis of the reports from district and national level may be delayed; 3) once an epidemic is suspected, there may be lack of both funding for fuel, available personnel, and diagnostic capacity to address the epidemic (RDTs, microscopy, reagents etc.); and 4) and lack of surge capacity in commodities to respond with a strong intervention (additional drugs, ITNs, IRS).

The Highland Malaria (HIMAL) surveillance project has been working to develop a system for the early detection of epidemics. This project attempts to predict epidemics through weather forecasting. It has provided valuable information on epidemic response and has significantly improved clinical malaria surveillance in southwest Uganda. Building on the work of this project, Uganda now has improved capacity to detect epidemics in this region.

Proposed year two activities *($75,000)*:

1. *Malaria Epidemic Control:* PMI year two will support epidemic surveillance and response by funding the investigation of any suspected outbreaks (includes costing for transport of investigators, field allowances), diagnosis through RDTs or microscopy, provide supplies, costs for drugs and equipment for malaria epidemic containment needed for stockpiling, and IEC required for rapid and successful epidemic response *($75,000).*

INTERVENTIONS – TREATMENT

MALARIA CASE MANAGEMENT

Current status

As a result of studies conducted in children under five showing high levels of resistance to CQ/SP, in 2004 Uganda adopted the ACT artemether-lumefantrine (Coartem®) as the first-line treatment for uncomplicated malaria and AS/AQ as the alternate. Quinine is still recommended as the first-line treatment for complicated malaria and the treatment of uncomplicated malaria in pregnancy.

With funding from the GFATM Round Four grant, Uganda implemented its new drug policy in 2006. In February 2006, Uganda began to receive in monthly shipments of 15.5 million treatments of ACT for distribution through health facilities. In March and April 2006, the NMCP trained over 30,000 health workers nationally on the proper use of the new drug and the health facilities began to receive drugs a month later.

Since implementation, stock outs of ACT in health facilities have plagued the private and public system. As of early August 2006, nine out of the eleven planned ACT shipments had arrived in country and the National Drug Authority (NDA) had cleared five, but only approximately two shipments have been delivered to the districts. To accelerate the roll-out of ACT, the National Medical Stores (NMS) used a push system for the first delivery with the expectation that the distribution mechanism would switch to a pull system for subsequent deliveries. However, the initial amount of ACT pushed to the districts was far less than the districts had requested, creating a shortfall in supply. Consequently, district health facilities are not receiving appropriate quantities of ACTs and they are rationing the drug.

Compounding the distribution problems are concerns that the amount of ACTs being procured is insufficient. Although a systematic quantification has not been completed, the MOH estimated that 25 million treatments of ACT per year are needed to ensure full supply. Under GFTAM Round Four grant, Uganda received 15.5 million treatments in 2006 and will receive only 22 million treatments of ACT in 2007. The NMCP does not expect any delays with this procurement, but it is still unclear how the shortfall from 2006 will affect distribution in 2007.

As previously described, Uganda also has been implementing a HBMF program using a combination of CQ/SP. The Homapak (CQ/SP) is distributed through volunteer community drug distributors to facilitate the treatment of fever in children under five within 24 hours. Currently, the NMCP has a national plan to replace Homapak with ACTs beginning in the north in September 2006 followed by a national roll-out in 2007 when the current supply of Homapak is expected to run out. The northern districts were chosen as the pilot site due to the strength of their HBMF program.

The PMI is supporting an evaluation study of the process of rolling out community ACTs in one district. This evaluation will inform the NMCP on potential programmatic issues that may occur during a national roll-out of community-level ACT distribution.

The private sector is a major source of antimalarial drugs in Uganda and is often the first source of treatment. As of now, the private sector remains largely unregulated and little emphasis has been placed on training private drug distributors on the new drug policy. There is concern that drug distributors are selling partial treatments of ACTs and/or artemisinin-based monotherapies. Using non-PMI malaria funds (FY05), the AFFORD project has developed materials to educate the private sector on the new ACT policy and to encourage compliance with NMCP treatment guidelines. A total of 1,000 health practitioners and drug distributors have been trained as of August 2006.

PMI progress to date

In the first year of the PMI, the PMI supported the roll-out of ACTs by providing supportive supervision to the 13,144 health workers following the NMCP training in the 29 districts supported by the USAID/UPHOLD project. The PMI has also funded the development of radio spots and leaflets targeting both health workers and the community to promote adherence to the new treatment regimen.

As discussed above, the switch from CQ/SP to ACT in HBMF is a major policy and operational issue facing the NMCP. In year one, the PMI supported an evaluation study of the roll-out of community ACTs in one district. This evaluation will inform the NMCP on program issues that may come up during a national roll-out of community-based ACT use. The PMI is also providing the WHO with 297,780 pediatric doses of ACT for their roll-out of HBMF in the northern conflict districts and is providing support and training to the community-drug distributors.

To address the myriad of pharmaceutical management issues that have arisen in the transition to ACTs, the PMI supported RPM*plus* to work with the NMS. RPMplus is providing technical assistance to the NMS to manage the supply chain including the planning, quantification, implementation of national procurements for the public and private distribution of malaria medicines and commodities.

Proposed year two activities *($3,685,000)*:

1. *Procurement of ACTs:* The major source for procurement of ACT for the government and NGO health facilities will be from the GFATM Round 4 grant. In 2007, the Round 4 grant plans to fund the procurement of approximately 22 million treatments of ACT. The PMI will assist procuring approximately three million pediatric doses for distribution through both the NMS and the Joint Medical Stores distribution systems to help fill this shortfall (*$2,725,000*).

2 *Logistics and supply management:* The PMI will provide technical assistance and help to the NMS to quantify the actual ACT need for the country, and bring the NMCP and the NMS together to revise the current distribution strategy to eliminate stock outs of ACTs. PMI will also support the NMCP to promote rational drug use in the health facilities and in the community (*$500,000*).

3 *Private Sector Drug Distributors*- Private sector drug sellers/drug shops/pharmacies continue to be a major source of malaria treatment for the population. The PMI will continue to support efforts to train private sector providers on the appropriate use of ACTs and to discourage the sale of monotherapies (*$50,000*).

4 *Supportive Supervision for health workers:* The NMCP will be supported to provide support supervision of health workers. This will help to improve and maintain good practices, especially focusing on the use of ACTs, laboratory confirmation of malaria and community roll out of ACTs (*$100,000*).

5 *Supportive supervision for community-drug distributors:* Supervision of the community drug distributors working in HBMF is a serious gap for which the districts lack funding. This becomes even more of a gap as HBMF with ACTs is rolled out. The support will include supervisory visits, quarterly supervision meetings and reporting (*$100,000).*

6 *Training community health workers on HBMF with ACT:* Provide training on new ACT treatment policy to community health workers in districts where the NDA has approved cACT through HBMF (*$100,000*).

7 *IEC support for roll out on ACT:* The change from CQ/SP to ACT will require community education. Various techniques in IEC communications will be used e.g. mass media, IEC materials, and community education (*$110,000*).

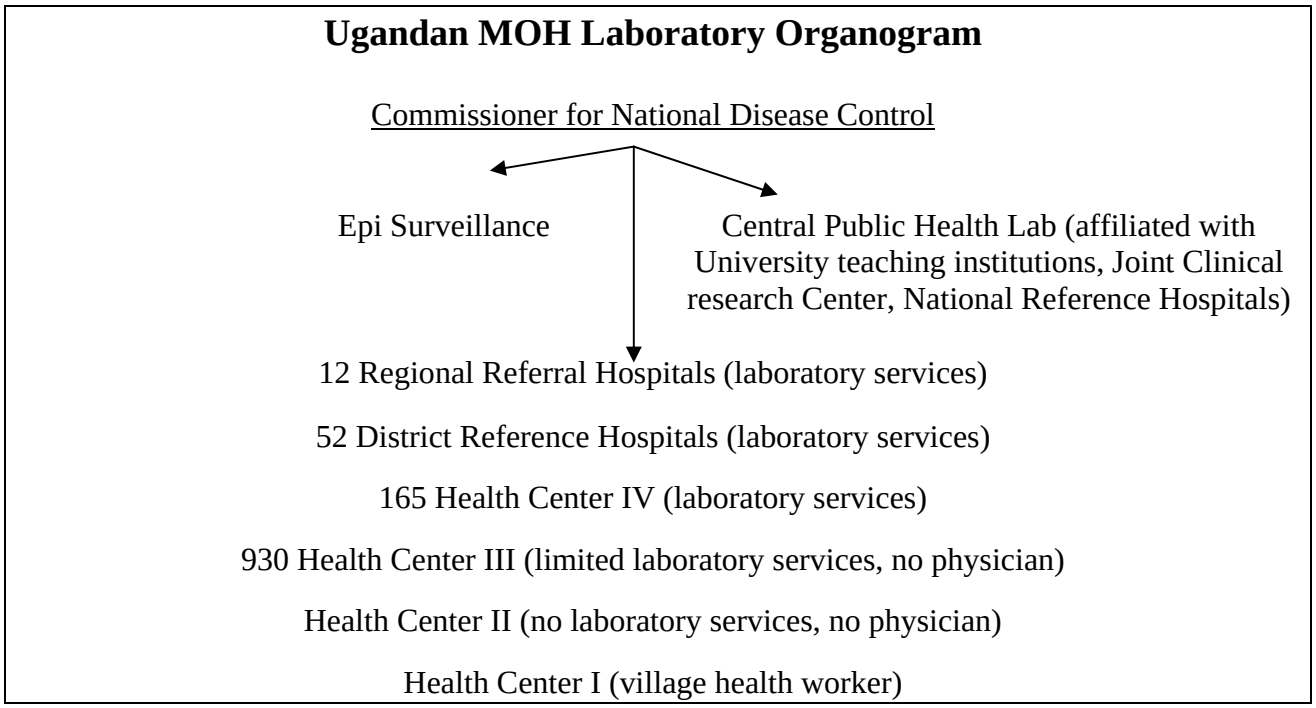
MALARIA DIAGNOSIS

Current status

The roll-out of the more expensive ACTs has highlighted the need to strengthen laboratory diagnostics at health facilities. Most of malaria diagnoses in health facilities are based on clinical presentation alone and make up 25-40% of all out-patient visits. The current malaria treatment guidelines of the NMCP state the following: "Any patient with fever or a history of fever within the last 24 hours without evidence of other diseases should be treated for malaria even with a negative blood smear for malaria parasites." In fact, where laboratory facilities exist, blood examination for malaria parasites is to be done for patients who present with features of severe malaria, patients who have taken anti-malarial treatment for two days and symptoms persist, children under four months of age, and pregnant women with symptoms of uncomplicated malaria. However, the strategy document also cautions that the accuracy of these laboratory tests are variable, and therefore recommends presumptive treatment of malaria for persons with fever within 24 hours without evidence of any other disease.

The variability of the laboratory diagnosis of malaria is likely due to limited resources and lack of updated training available. At the sub-county level, the health centre level III is the lowest level in the health delivery system with a laboratory and is supposed to offer basic laboratory tests. Only 346 of the 901 health centre IIIs have functional laboratories. The Central Public Health Laboratory (CPHL) is mandated to coordinate, monitor and supervise all the health centre III and IV level laboratories but the CPHL is grossly understaffed, having only three persons and limited resources

to carry out this mandate. Many of the laboratories have even fewer resources and the quality of service is low.



The facilities include 104 hospitals (57 government, 44 NGO and 3 Private), 250 health centers (179 government, 68 NGO and 3 private), palliative care 2 (government 1, NGO 1) and others (989 government, 352 NGO and 41 private).

With PEPFAR funds, 35% of the national requirements of microscopes have been purchased and AMREF has conducted quality assessments in the various facilities and trained laboratory personnel on laboratory management and quality control. Through the GFATM Round Two, 150 additional microscopes (representing 25% of the national need) have been ordered, however the 150 microscopes have yet to arrive in country. Even if all the microscopes were available, a 40% deficit would remain amounting to 360 microscopes.

A promising new project has been launched by the Institute of Infectious Diseases (IDI) of Makerere University in collaboration with the UMSP to develop a strong training program to address many of the weaknesses in laboratory diagnostic capacity and integrated clinical management of malaria cases. With some funding from EXXON/Mobil, the project plans to provide an integrated comprehensive training for 200 laboratory personnel and lab technicians at district hospitals and health centre IVs, and provide an upgrade training for clinicians to improve expertise in clinical management of uncomplicated and severe malaria. Additional contributions would allow for the doubling of the number of laboratory technicians and clinicians trained in 2007. Following the training, mobile surveillance teams will visit each facility to provide supportive supervision, additional training, and quality control.

Once the training of the initial laboratory technicians is complete, they will work together with the mobile team to train health center III staff members in the field. The mobile teams will work closely with the district laboratory focal person to coordinate and monitor district level training and quality control of laboratory diagnosis for each health center III.

At lower level health facilities, the NMCP presently does not recommend routine use of rapid diagnostic tests (RDTs) for diagnosis in Uganda except in the cases of epidemics and in children under four months. The NMCP is expecting RDTs in the country under the GFATM Round Four grant and this will be used for pilot studies in three districts. This will help inform where and when to use RDTs.

Progress to date:
In year one, the PMI did not provide support to strengthen malaria diagnostic capacity. It was identified as a need but there was insufficient funding.

Proposed year two activities *($450,000)*:

1. *Diagnostics:* The PMI proposes to provide additional funding to expand IDI and UMSP's efforts strengthen the laboratory diagnostic capacity at health facilities. It is envisioned that 12 trainings will be done in 2007 with at least 200 laboratory assistants, microscopists, clinicians, and data managers trained. There will be a need for two mobile teams equipped with two vehicles, diesel, training materials, laboratory supplies, to enable them to support the field training. Each site that is trained will add to the sentinel site surveillance system if they were qualified by the mobile teams. The data generated from these sites will give numerator/denominator data for suspected and confirmed malaria cases which would give an accurate and necessary reflection of the burden of disease in their area. Provision of 50 microscopes and supplies to designated health facilities (that have been assessed to lack proper equipment/supplies) will be supported ($*450,000*).

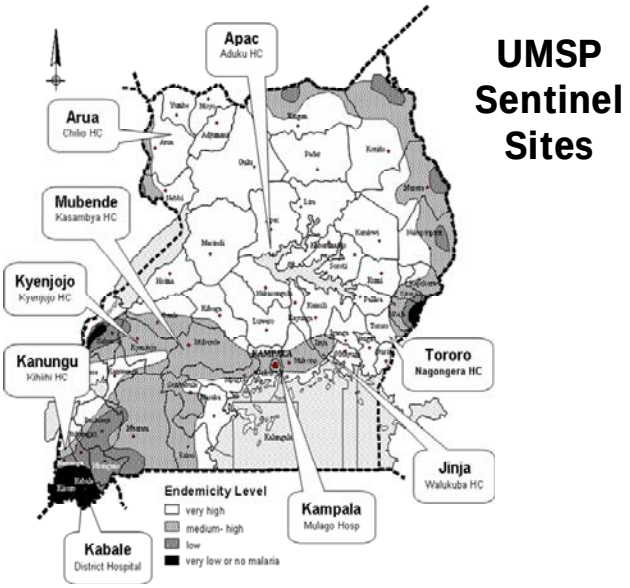
DRUG QUALITY AND RESISTANCE MONITORING AND PHARMACOVIGILLANCE

Current Status

The MOH through the UMSP supports eight sentinel sites to monitor antimalarial drug safety (pharmacovigilance) and drug efficacy, and to collect accurate malaria morbidity and mortality data. CDC has supported the UMSP at Makerere University in collaboration with the University of California, San Francisco (UCSF) to provide technical assistance to develop and sustain these eight sentinel sites. UMSP provide active surveillance for drug safety monitoring and they work with the NDA which is responsible for a national passive adverse events reporting system.

Despite support from CDC through UCSF, currently only two sites per year are fully funded to do pharmacovigilance and efficacy surveillance. The MOH would like to continue and expand these activities to inform the program directorate of any need for antimalarial treatment policy review.[11] The wide use of ACTs at both the community and facility levels has raised concerns about resistance and prompted the demand for further investment in resistance monitoring. There is a need to support evaluations of ACT resistance in one low, moderate, and high transmission area to ensure that resistance rates remain low.

[11] The East African Network for Monitoring Antimalarial Treatment (EANMAT) was established in 1997 with 8 sentinel sites in Uganda, Kenya and Tanzania. In Uganda, seven of these sites have successfully conducted many rounds of studies. Data from these sites were used as evidence to change the malaria treatment policies.



In addition to passively monitoring adverse events, GOU has mandated the NDA do random testing on all antimalarial drugs that are imported or manufactured in the country before they can be sold. Currently, the NDA tests all antimalarial drugs legally imported into the country for quality. The NDA is also mandated to conduct post-market surveillance so that they can detect fraudulent drugs; however, NDA has only limited capacity in this area and many fraudulent drugs being smuggled into Uganda undetected. In order to have a robust post-market surveillance and pharmacovigilance system, NDA's activities in these areas should be expanded so that they complement the existing sentinel site system.

Progress to date

In 2006, the PMI tried to address the need to build the capacity of NDA by providing, through USP, a new high-pressure liquid chromatographer, and gas chromatographer, along with training. This has increased NDA's ability to quickly conduct post-shipment testing of ACTs arriving in country and increase their post-market surveillance activities.

Proposed year two activities *($400,000)*:

1. *Implement and improve system for testing fraudulent drugs at national level:* Support NDA to develop a system of post-market surveillance for antimalarials and testing (*$200,000*).

2 *Monitor drug resistance (efficacy) and adverse reactions to anti malarial drugs:* Continue drug efficacy testing and adverse events reporting on antimalarials at one low, moderate, and high transmission sentinel site to inform policy decisions and support development of national capacity (*$200,000*).

MONITORING AND EVALUATION

Current status

Monitoring and evaluation to measure progress against project goals and targets, to inform project implementation, and to facilitate adjustments in implementation is a critical component of the PMI. In Uganda, rapid scale-up of malaria prevention and control interventions and achieving high coverage rates with ACTs, ITNs, IPTp, and IRS are priorities not only for the PMI, but also for the NMCP, the GFATM, and other national and international partners working on malaria. For this reason, efforts will be made to coordinate all monitoring and evaluation activities and ensure uniformity of indicators, data collection and analysis methods, and reporting.

The 2006 Demographic and Health Survey (DHS) will be completed by late 2006 and will serve as the baseline data for the PMI. The current level of malaria-mortality will be estimated using several different mechanisms including verbal autopsy, Demographic Surveillance System (DSS) site, and sentinel site surveillance. The 2007, Uganda Service Provision Assessment (UgSPA)/Health Facility Survey (HFS) will be used to monitor the availability and quality of health services.

Evaluation of Progress toward the President's Malaria Initiative Goal and Targets:

The PMI evaluation plan in Uganda consists of several major components:

- Evaluation of impact on all-cause mortality. Given that the majority of malaria cases are not laboratory confirmed, it is difficult to assess the burden of the disease. However the PMI will continue to evaluate the trends in the NMCP surveillance monitoring system and it is expected that improvements in laboratory diagnosis, surveillance reporting and data management will improve the ability to measure this indicator.
- Evaluation of coverage rates for the four key interventions, ACTs, ITNs, IPTp, and IRS (e.g., percentage of pregnant women sleeping under an ITN the previous night). This will be routinely collected from PMI partners via the MEMS project.

Monitoring indicators for Malaria Mortality and Morbidity

The overall goal of the PMI program is to decrease malaria mortality by 50%. Diagnosis of malaria may be laboratory confirmed in some district hospitals but generally the cause of illness or death is based on clinical case definition. Since the clinical findings of malaria may overlap with other common childhood diseases, it is difficult to differentiate causes of morbidity or mortality or the impact of PMI interventions. Laboratory confirmation of malaria is strongly supported by the MOH and efforts are being made to improve and sustain the capacity of the laboratories nationally.

Data collected through verbal autopsy, sentinel sites, and demographic sentinel system (DSS) surveillance will augment all-cause mortality with estimates of proportions of deaths attributable to malaria and also provide measures of morbidity (confirmed cases, hospitalized cases, severe anemia and transfusions) from available data including national representative surveys and selected sites.

Data sources for malaria-related indicators

Data sources for malaria related indicators may be found through the following sources:

- DHS conducted by the Ugandan government, 2006 (This will provide background information for national level verbal autopsy in 2007);
- NMCP district morbidity and mortality surveillance collected through the Health Management Information Systems (primarily clinical malaria);

- Verbal autopsy validation study (2006 funded with expected 2007 completion date) through the Uganda Malaria Surveillance Project;
- Verbal autopsy survey 2007 (establishment of malaria attributable deaths baseline),
- Sentinel Site Surveillance – UMSP and MOH (by the end of the 2007 we may have some data on malaria-attributable mortality); and
- DSS coordinated through the Institute of Public Health at Makerere University will provide malaria mortality and all-cause mortality data .

The HMIS system

Uganda's HMIS collects disease and case incidence data from all districts in Uganda. Most districts report from 60% of all sub-districts and some report from as many as 70-80% of sub-counties. There is an upward cascade of reports: from the health units to Health Sub-districts (HSDs), to district headquarters, then to the MOH. Additionally, the MOH has put in place an Integrated Disease Surveillance and Response system which also collects data from the facility level. Through the HBMF program, community data is available and is to be reported to the health facility, but it is incomplete and of poor quality and not generally aggregated at district or national levels.

At the national level there is a lack of proper analysis of the general district level malaria indicators for surveillance in the 77 districts. This impedes the NMCP progress in development of targeted approaches to malaria control, understanding of when outbreaks of malaria are occurring and responding appropriately, and/or formulating plans for high risk groups.

Monitoring Through the DSS

There are two DSS sites in Uganda. The first, the Rakai Health Sciences Program is well established and has focused primarily over the last 17 years on HIV/AIDS research in the adult community. The second DSS is associated with the Makerere University Institute of Public Health and is located in the districts of Mayuge and Iganga. The PMI will work to strengthen this DSS and data from these sites will be used to monitor all cause mortality in children under five year olds as well as malaria attributable deaths. It could also evaluate the impact of the new malaria treatment policy (ACT) on malaria morbidity and mortality within the DSS. These evaluations are not available in any other population-based assessment and could potentially help guide MOH policy decisions.

The 2006/07 Uganda Service Provision Assessment (UgSPA)/Health Facility Survey (HFS)

The 2006 UgSPA is a nationwide facility-based survey designed to collect information on the availability and quality of reproductive and child health care, infectious disease (malaria and TB) and HIV/AIDS services provided to Ugandan men, women and children in public, private and not-for-profit health facilities. The survey will gather information on quality of care provided to malaria patients in areas of diagnosis, treatment, counseling and education. The information generated from the survey will serve as both situational analysis/baseline, identify ways to improve services and will provide further monitoring and evaluation of the scale-up of malaria interventions. Approximately 630 facilities will be included in the sample and the sample of facilities will be designed in such fashion as to allow for national and regional estimates for key indicators.

Entomological and Epidemiological Monitoring and Evaluation

The Uganda MOH has some strength in support of entomologic and vector control infrastructure. This includes the Vector Control Unit (VCU) of the NMCP (Kampala), with good technical level entomologists: the Entomology Department and the Uganda Virus Research Institute (UVRI), in Entebbe which has three PhD-level mosquito experts as well as trained technical staff.

These three groups worked together last year to establish a vector insecticide resistance monitoring program for the IRS activity in Kabale. A CDC/UVRI /NMCP/VCU/ RTI training in the use of the bottle bioassay for mosquito insecticide-resistance monitoring was held at UVRI in March of 2006 which was supported by PMI.

The NMCP should be monitoring and evaluating the following as it rolls-out more aggressive use of LLINs and IRS:

- Monitor mosquito populations for susceptibility to insecticides to detect selection for physiological and behavioral insecticide resistance associated with IRS/ITN use. Behavioral and physiological resistance can be monitored through WHO recommended human bait collections conducted inside and outside houses with IRS/ITNs using the CDC bottle assay, and subsequently identified to species and the sporozoite rate determined using the *P. falciparum* CSP ELISA. When resistance is identified, CDC/Atlanta staff will assist in identification of the mechanism(s) using biochemical and molecular methods.

- Indoor *Anopheles* vector densities to detect changes in IRS/ITN insecticidal efficacy and changes in man-vector contact rates. Efficacy should be monitored and evaluated using indoor pyrethrum spray collections with the mosquitoes collected identified to species and the sporozoite rate determined using the *P. falciparum* CSP ELISA.

- Quality assurance of IRS treatment and ITNs to verify both the initial efficacy and longevity of ITNs and IRS treatment. The standard WHO cone bioassay would be used for these evaluations.

Monitoring and Planning for IRS

The NMCP has interest in building the capacity to develop an information technology network to allow for real time evaluation of IRS/LLINs coverage through databases (PDAs) and mapping (GIS) and to provide information for evidence-based planning. There is a need to use equipment and technologies that will allow for more accurate and effective planning.

In IRS programs, PDAs will be programmed to map houses sprayed, record time required to spray each house, record time spent traveling between houses, record number of houses done each day, record number of people in each house, and the amount of insecticide sprayed. PDAs will help estimate personnel and transport costs associated with IRS program in areas with different population densities.

The use of bar coding to track insecticidal sachets and ID cards to relate the sachets to the sprayer can help address insecticide leakage. A similar approach may be used for ITN distribution and net retreatment campaigns with limited modification.

While entomology expertise is relatively high in Uganda, it is also necessary to provide additional entomological training in mosquito collection and identification. A CDC/UVRI /NMCP/VCU/ RTI meeting will be planned for 2007 to coordinate, discuss and review technology for monitoring transmission rates in Apac (proposed site of IRS + LLINs) and to build local capacity to estimate vector density, infectivity, and entomological inoculation rates. An insectory to rear mosquitoes is needed for the bioassays.

Insecticidal-Treated Mud Evaluation

The smearing of walls with fresh mud every 2-3 months is common in northern Uganda and many other countries where adobe-like structures are built, but this practice may compromise the insecticidal effect of IRS. Initial and on going studies at the CDC insectory have shown promising results using a mud-based insecticide (ICON EC) smeared on a mud wall, showing that after week 13, there is still 70-80% knock down rate. The next steps in evaluation of this potential intervention are a field-based evaluation.

The IDP camps of northern Uganda are an ideal place for the evaluation of 'smart mud' due to the prevalence of smearing, and the relatively high level of entomological capacity compared to other countries. A sample of mud houses would be chosen and smeared with the insecticidal mud. A formal detailed protocol is being written which takes into consideration all the safety issues, monitoring and efficacy testing involved in this kind of evaluation.

Proposed year two activities ($1,295,000):

1. *Strengthen national level analysis of malaria surveillance data:* In year two, the PMI will continue support to HMIS to increase malaria data quality to evaluate impact on malaria epidemiology in the areas where vector control, especially IRS, has been implemented. Currently there is no mechanism in place at the malaria control program to evaluate these large scale implementations (*$30,000)*

2. *Strengthen one DSS site:* In year two, the PMI will focus on strengthening the Makerere University DSS site which may provide the necessary data to measure all-cause mortality and malaria related mortality. They may also provide information on cACT use (*$100,000*).

3. *Support verbal autopsy to the 2007 DHS:* Verbal autopsy allows the DHS to identify malaria deaths and thus create a baseline of malaria mortality. Concurrently, this will provide an opportunity to examine the sensitivity and specificity of verbal autopsy to identify malaria deaths[12] (*$200,000*).

[12] The verbal autopsy validation study will be completed in 2007. This study could not be adequately done for the amount allocated from year 1. The VA national survey will be done after the validation study and will need additional funding to complete it.

4. *Program monitoring: Collect HIS and other data on ITN use, IRS coverage, IPT coverage, ACT roll-out, and quality improvement:*. The MEMS project will serve as central data collection point to analyze PMI progress towards the goals and allow for rapid reporting of results (*$100,000*).

5. *Uganda Service Provision Assessment/Health Facility Survey:* Support to USPA/HFS to collect facility base quality of care indicators (*$200,000*).

6. *Entomologic Monitoring Capacity*: In order to support and adequately evaluate the IRS (and ITN) programs we will need to ensure entomologic monitoring for evaluation of impact through the following: 1)quality assurance of vector control and population (example: bioassays/filter testing), 2) understand the insecticide resistance patterns to ensure selection for appropriate future insecticides, (example: susceptibility testing) 3) Vector bionomics studies, 4) Train national staff in entomological M&E and 5) Technical and logistical support for IT, PDAs and mapping (*$400,000*).

7. *Entomological Capacity Building:* Provide training for vector control officers to evaluate impact of IRS and ITN. *($100,000)*

8. *Epidemiological Monitoring:* Provides data and monitoring on the epidemiological impact of linking IRS and ITNs.

9. *Public Health Evaluation of 'smearing' with insecticide to sustain duration of insecticidal effect:* Field evaluation of mud smearing with insecticides in IDP setting or DSS location. (*$55,000*).

10. *Support for ICCM technical working groups:* Coordination and logistical support to ensure regular meetings of the ICCM technical working groups to improve communication and quality of meetings (*$10,000*).

STAFFING AND ADMINISTRATION

Two new health professionals will be hired to oversee the PMI in Uganda, one representing CDC and one representing USAID. In addition, one or more FSNs will be hired to support the PMI team. All PMI staff members will be part of a single inter-agency team led by the USAID Mission Director or his/her designee in country. The PMI team will share responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for these positions will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

It is envisioned that these two PMI professional staff will work together to oversee all technical and administrative aspects of the PMI in Uganda, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both staff members will report to the USAID Mission Director

or his/her designee. The CDC staff person will be supervised by CDC, both technically and administratively. All technical activities will be undertaken in close coordination with the MoH/NMCP and other national and international partners, including the WHO, UNICEF, the GFATM, World Bank and the private sector.

Locally-hired staff to support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller.

APPENDICES

Table 1
President's Malaria Initiative – Uganda
Year 2 (FY07) Timeline of Activities

ACTIVITY	2006	2007											
	SEP-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Planning													
MOP Development													
Micro planning of PMI interventions													
IRS planning													
ITN distribution planning													
Net re-treatment planning													
Logistics													
Purchase insecticides and IRS equipments													
Purchase LLINs/re treatment kits etc													
Purchase ACT													
Purchase microscopes, equipment, chemicals & other supplies													
IEC/BCC													
IEC/ Social mobilization campaigns for IRS													
IEC ITN use													
IEC net re-treatment													
IEC IPT													
IEC ACT													

ACTIVITY	2006	2007											
	SEP-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Training													
Entomology training													
Training spray squads													
Training on net re-treatment													
IPT training for private/NGO sector													
Training private sector on ACT													
Training CDDs on HBMF with ACT													
Training lab technicians on malaria diagnosis													
Services													
IRS Kabale/Kanungu													
IRS Apac													
IRS IDPs													
Free LLINs distribution-ANC													
LLINs distribution- community													
LLINs distribution- Private sector													
Net re-treatment campaign													
Improve UNBS capacity to monitor net quality													
IPT ANC/PMTCP													
Epidemic investigation/ response													
Improve & support NMS's supply chain management													
Implement and improve system for testing fraudulent drugs													

ACTIVITY	2006	2007											
	SEP-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Support supervision													
Support supervision to malaria control interventions													
Supervision to CDDs involved in c-ACT													
Monitoring & evaluation													
IRS Environmental monitoring													
Base line and post entomological surveys/mapping													
Follow up net usage, retention & sustainability													
Monitor drug resistance & adverse reactions to AMDs													
Verbal autopsy validation study/survey													
DSS													
Facility survey													
HMIS malaria data improvement													
IRS epidemiological monitoring													
PMI reporting & data collection													
Staffing													
Hire 2 PMI FSN in-country staff													

Table 2
PMI Planned Obligations FY 2007

Proposed Activities	Mechanism	Budget $	Commodities	Geographic Area	Description of Activity	Relation to Intervention
PREVENTION ACTIVITIES						
Second round of Indoor Residual Spraying (IRS) in targeted (low elevation) areas of Kabale district	IRS IQC	$780,000	$280,000	Kabale District	IRS management, purchase insecticides, spare parts, etc. conduct refresher training and implementation of IRS in low elevation, high risk areas (50% of district households).	IRS
One round of IRS in high transmission areas of Kanungu district	IRS IQC	$1,500,000	$685,000	Kanungu District	IRS management, logistics, training, rented storage & transport. Environmental/ human health monitoring. IRS implementation in high transmission risk areas (70% of district house holds)	IRS
One round of IRS in Apac district with ITN distribution (cost of nets not included)	IRS IQC	$2,250,000	$1,015,000	Apac District	IRS management, logistics, training, rented storage & transport. Environmental / human health monitoring. IRS implementation & provide background support for ITN distribution & formative evaluation.	IRS
One round of IRS in selected IDP camps in Northern Uganda	IRS IQC	$1,000,000	$470,000	Northern Districts (Pader, Kitugum, Gulu)	IRS management, logistics, training, rented storage & transport. Environmental / human health monitoring. IRS in selected IDP camps	IRS
IEC/community mobilization for IRS	Health Communications Partnership (JHU/CCP)	$250,000		Apac, Kanungu, IDP camps (Kabale)	Develop IRS IEC/BCC module and conduct community mobilizations to increase acceptance for IRS	IRS

Sub Total (IRS)		**$5,780,000**	**$2,450,000**			
Procure and distribute free LLINs through ANC clinics, and the LLINs net facility.	AFFORD (JHU/CCP)	$3,150,000	$3,025,000	National	Purchase 550,000 LLINs and distribute freely to pregnant mother and children under 5 nationally through ANCs, net facilities and NGOs/FBOs.	ITN
Partnership with new donor to procure and distribute LLINs	AFFORD (JHU/CCP)	$1,100,000	$550,000	Selected districts	Purchase 100,000 LLINs and distribute 450,000 nets to vulnerable groups in campaign manner with IEC through NGOs/FBOs	ITN
Continue an annual net retreatment campaign	UPHOLD (JSI/ Malaria Consortium)	$700,000	$315,000	Selected districts	Mass re-treatment of 700,000 untreated nets in 29 districts.	ITN
Procure and distribute subsidized nets through the private sector	AFFORD (JHU/CCP)	$250,000	$210,000	National	Purchase 35,000 LLINS and distribute subsidized nets through private sector once the net campaigns completed.	ITN
Continue to develop private sector net market	NetMark*plus* (AED)	$550,000		National	Support development of the private sector net market including IEC	ITN
Improve UNBS capacity to monitor net quality	NetMark*plus* (AED)	$75,000	$25,000	National	Develop capacity of UNBS to monitor the quality of mosquito nets, provision of equipments, setting standards and guidelines and training relevant staff	ITN
Evaluation of net usage, retention and sustainability	CDC/TBD	$100,000		National	Follow up formative evaluation of retention and usage of nets to determine the current usage practices and inform policy decisions.	ITN

Continued IEC on correct and consistent use of LLINs	AFFORD (JHU/CCP)	$100,000		National	National level mass media and community IEC campaign for LLINs	ITN
Sub Total (ITNs)		**$6,025,000**	**$4,125,000**			
National level FANC training on IPT for private/ NGO sector	UPHOLD (JSI/Malaria Consortium)	$130,000		National	Provide training on the administration of IPT to private sector and NGO nationally, as part of a reinvigorated ANC	MIP/IPT
IPT through ANCs in northern Uganda	Northern Uganda Project (JSI/NGO partners)	$130,000		Northern Districts	Facilitate IPT at ANC clinics in Northern Districts	MIP/IPT
IPT through national PMTCT/MCH system	TBD	$130,000		National	Facilitate IPT at ANC clinics in PMTCT/MCH Districts	MIP/IPT
Continue support to IEC/BCC on IPT	Health Communication Partnership (JHU/CCP)	$150,000		National	Provide supportive community BCC to encourage women to seek 2 doses of IPT	MIP/IPT
Sub Total (IPT)		**$540,000**	**$0**			
Support to epidemic investigation and response	WHO	$75,000	$50,000	National	Support for investigation of suspected malaria outbreaks. Diagnostics, drugs, equipment and IEC for malaria epidemic containment.	Epidemic control
Sub Total (Epidemic)		**$75,000**	**$50,000**			
TOTAL: Preventive		**$12,420,000**	**$6,625,000**			

TREATMENT						
Procure ACTs to fill shortage	UNICEF	$2,725,000	$2,725,000	National	Procure pediatric doses of ACT to fill the gap	Case Management
Logistics, supply chain management & rational drug use support.	RPMplus (MSH)	$500,000		National	Continue technical and logistical support (Transport/ storage) to NMS/ MOH to roll-out ACTs, other anti malarials and LLINs.	Case Management
Continue to train private sector drug distributors on correct ACT use	AFFORD (Malaria Consortium)	$50,000		National	Provide training to private sector health care providers on use of new ACT malaria treatment policy/guidelines	Case Management
Continue to provide supportive supervision to malaria control activities by center & district	UPHOLD (JSI/Malaria Consortium)	$100,000		National	Supportive supervision by malaria control staff focusing on new ACT policy, definitive diagnosis, cACT roll out and vector control (ITN, IRS) to ensure the implementation.	Case Management
Provide supportive supervision to CDDs involved in c-ACT	Northern Uganda Project (JSI/NGO partners)	$100,000		Northern Districts	Support for supervisory visits, quarterly supervision meetings and reporting	Case Management
Training community health workers on HBMF with ACT	Northern Uganda Project (JSI/NGO partners)	$100,000		Northern Districts	Provide training on new ACT treatment policy to community health workers in districts where the NDA approved cACT through HBMF	Case Management

IEC/BCC on ACT roll-out	Health Communication Partnerships (JHU/CCP)	$110,000		National	Provides information and educational, media support for roll-out of ACT drug policy	Case Management
Management of malaria microscopy training and logistical support for strengthening diagnostic capacity at health facilities	CDC grant to UCSF/Institute of Infectious Diseases	$150,000	$75,000	National	Organize, administrate and manage lab technician & clinician high quality training on malaria microscopy, provide 50 microscopes/accessories and lab supplies.	Case Management
Malaria microscopy training and quality control in coordination with CPHL	CDC grant to UCSF/Uganda Malaria Surveillance Project	$300,000		National	Conduct TOT for lab technicians/ clinicians/data managers at the central level, facilitate training of lower level health centers in the field. Cost for transportation, fuel, equipment/supplies and training materials. Provide 2 malaria mobile teams to support field based training, evaluation, laboratory quality control and data management.	Case Management
Improve NDA capacity & implement system for testing fraudulent drugs at national level	U.S. Pharmacopia	$200,000		National	Support for random testing of non-regulatory drugs which may be fraudulent.	Case Management
Monitor drug efficacy, resistance and adverse events reporting & build NDA's capacity	CDC grant to UCSF/Uganda Malaria Surveillance Project	$200,000		National	Evaluate the efficacy and safety of combination antimalarial therapies being considered for widespread use or already being used in Uganda & building NDAs' capacity on this area	Case Management
TOTAL: Treatment	**$4,535,000**	**$2,800,000**				

MONITORING AND EVALUATION						
Support for HMIS malaria data quality improvement	CDC	$30,000		National	Support for data manager to assist the NMCP M&E team.	M & E
Support for DSS	CDC	$100,000		National	Support the strengthening of a DSS site to obtain annual longitudinal baseline malaria mortality and morbidity data	M & E
Continued verbal autopsy baseline mortality establishment	Measure DHS (ORC Macro)	$262,000		National	National verbal autopsy survey to establish baseline malaria mortality	M & E
Continued support to PMI reporting and data collection	MEMS	$100,000		National	Collects and analysis data for reporting PMI progress	M&E
Facilities survey (co funded with PEPFAR, POP)	Measure DHS (ORC Macro)	$200,000		National	Support for facility survey	M & E

IRS baseline, entomological data collection, GIS & mapping	CDC	$400,000	$100,000	National	Conduct IRS baseline entomologic surveillance and impact assessment. Support for susceptibility, bio assays and vector bionomic studies. Build national capacity to develop IT net work for real time evaluation of IRS/LLINs, develop databases (PDAs) and mapping (GIS) for decision making.	
IRS epidemiological monitoring	CDC	$100,000		National	Evaluate impact of IRS in 3 districts and several IDP camps (2 million pop). Consider 1 prevalence study in Apac and strengthen malaria surveillance	M & E
Entomological capacity building	CDC grant to Uganda Viral Research Institute	$100,000		National	Provide training to vector control officers on entomological techniques, logistic support for entomology and insectory support.	M & E
Development of alternative insecticide based vector controlling using smearing	CDC	$55,000		Northern Districts	Public health evaluation of alternative and sustainable insecticide protection in mud houses.	M & E
Support for ICCM technical working groups	UPHOLD (JSI)	$10,000		National	Coordinate and logistical support to ensure regular meetings of the ICCM technical working groups to improve communication and quality of meetings	M & E
TOTAL: M&E		**$1,357,000**	**$100,000**			
In-country staff;	CDC/USAID	$688,000			CDC, USAID PSC and 2 FSN salaries and benefits, travel, equipment, and local support costs	Staffing
PMI: TOTAL	**$19,000,000**	**$9,525,000**	**50.13% (Commodities)**			

Table 3
Uganda – Year 2 Targets Assumptions and Estimated Year 2 Coverage Levels

Targets:
By the end of 2010, the PMI will assist Uganda in achieving the following targets among at-risk populations for malaria:

1. >90% of households with a pregnant woman and/or children under five will own at least one ITN;
2. 85% of children under five will have slept under an ITN the previous night;
3. 85% of households will own at least one ITN
4. 85% of children under five with suspected malaria have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of the onset of their symptoms;
5. 85% of pregnant women will have slept under an ITN the previous night;
6. 85% of pregnant women will have received two or more doses of IPT during their pregnancies;
7. 85% of houses targeted for IRS will have been sprayed; and
8. 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months

Assumptions:
Population of Uganda (estimated): 24,000,000 persons

Pregnant women:	1.3 million pregnant women
Children <5:	5.2 million children under five years old
Households	5.6 million Households

Average total number of malaria-like illnesses per year and cost per treatment with ACT:

Children <5:	12,000,000/year ($0.45 per treatment)
Older children/adults:	2,788,500(assume average of $1.35 per treatment)

Cost of IPT with SP: $0.20 ($0.10 for each of the two treatments a woman will receive during her pregnancy)
Average household will require 2.5 ITNs to cover all children under five and pregnant women in the family
Cost of a long-lasting ITN = $7.00

Intervention	Needs for 100% Nationwide Coverage	Needs for 85% Nationwide Coverage (PMI 2010 target)	Needs for Year 2 PMI targets	Year 2 Contributions
IPT	1.3 million pregnant women x 2 treatments/woman = 2.6 million treatments	2.2 million doses	Target: 45% (baseline: 33%) 1.04 million doses needed	GFATM is providing 12 million does of SP; No PMI contribution
LLINs	5.2 million children <5; 1.3 million pregnant women **TOTAL** = 6.5 million LLINs*	5.5 million LLINs	Target: 60% of children under five (baseline: 15%) 2.475 million ITNs needed (not including year 1 contributions) Target: 45% of pregnant women (baseline: 12%) 429,000 ITNs needed (not including year 1 contribution) Total needed: 2.904 M	Year 1 estimated LLIN distribution: LLINs 1: 2.,972,217 PMI year 2: 687,500 LLIN
ACTs – children < 5 ACTs – older children and adults **TOTAL**	5.2 million children x 2.5 episodes/year = 13 million treatments 18.8 million treatments (assumes 1 episode per adult population) 24 million treatments	13 million x 85% = 11.1 million treatments 18.8 million x 85% = 16 million treatments 27.1 million treatments	Target: 45% (Baseline: 0%) 5.85 million pediatric treatments 8.46 million treatments 14.3 million treatments	GFATM- 22 M treatments PMI: 6 M pediatric doses Total: 28 M Adults are not the target population for the PMI
IRS	2nd round in Kabale, 1st round in Apac, Kanugu Select IDP camps	3 districts	Target: 85% of targeted areas in 3 districts	PMI- funding for spraying of targeted populations in 3 districts.

* This assumes every pregnant women and child under five receives an ITN

Table 4
Year 2 (FY07) Estimated Budget Breakdown by Intervention

Area	Commodities (%)	Other (%)	Total
Insecticide-treated Nets	$ 4,125,000 (68.5%)	$ 1,900,000 (31.5%)	$6,025,000 (100%)
Indoor Residual Spraying	$2,450,000 (42.4%)	$3,330,000 (57.6%)	$5,780,000 (100%)
Case Management	$2,800,000 (61.7%)	1,735,000 (38.3%)	$4,535,000 (100%)
Intermittent Preventive Treatment	$0 (0%)	$540,000 (100%)	$540,000 (100%)
Epidemic Preparedness	$50,000 (66.7%)	$25,000 (33.3%)	$75,000 (100%)
Monitoring and Evaluation	$100,000 (7.4%)	$1,257,000 (92.6%)	$1,357,000 (100%)
Administration	$0 (0%)	$688,000 (100%)	$688,000 (100%)
Total	**$9,525,000 (50.1%)**	**$9,475,000 (49.9%)**	**$19,000,000**

Table 5
Year 2 (FY07) Budget Breakdown by Partner ($000)

Partner Organization	Geographic Area	Activity	Budget
IRS IQC	Apac, Kabale, Kanugu, and IDP camps	One round of IRS in 3 districts and IDP camps	$5,530,000
AFFORD	Nationwide	Procurement and distribution of LLINs, support for private sector drug market	$4,650,000
UNICEF	Nationwide	Procurement of Coartem	$2,725,000
CDC	Nationwide	M&E activities, drug resistance monitoring, public health evaluations, entomological support, and diagnostic capacity building	$1,773,000
UPHOLD	29 Districts	ITN net retreatment, support for scale-up of IPT	$940,000
Netmarkplus	Nationwide	Support for private sector LLIN market	$625,000
JHU/CCP	Nationwide	BCC support for Scale-up of IPT, IRS and ACTs	$510,000
RPMplus	National	Pharmaceutical Management support for ACTs	$500,000
USAID	NA	Staffing and Admin	$450,000
Northern Uganda	9 northern districts	Support for community health workers, IPT	$330,000
Measure/DHS	Nationwide	Health Facilities Survey and verbal autopsy	$462,000
USP	Nationwide	Drug quality monitoring support for NDA	$200,000
TBD	PMTCT/MCH Sites	IPT support in PMTCT/MCH clinics	$130,000
MEMS	N/A	M&E and Reporting	$100,000
WHO	Epidemic-prone districts	Epidemic preparedness and response	$75,000