

**NATIONAL STRATEGIC PLAN FOR MALARIA PREVENTION
CONTROL AND ELIMINATION IN ETHIOPIA
2011 - 2015
(2003/2004 -2007/2008 E.C.)**

**August 2010
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Foreword

In recent years, Ethiopia has made significant strides in expanding coverage of key malaria interventions throughout the country, thanks to the substantial and sustained support provided by our diverse partners, as well as the firm commitment of our Government and national stakeholders. Major scale-up efforts began in 2004/ 2005, with the introduction of artemisinin-based combination therapy (ACT) as the first line treatment, expanded use of rapid diagnostic tests (RDT) as well as stepping up of vector control and prevention through the wide distribution of long-lasting insecticidal nets (LLINs) backed by targeted indoor residual spraying (IRS). The main aim of expanding access to these interventions was to achieve the objectives of the 2006-2010 five-year National Malaria Strategic Plan (2006-2010) based on the 'Scale-up for Impact' (SUFI) approach. We have since been aggressively and successfully implementing this scale up effort through support of the Global Fund, the Carter Center, UNICEF, USAID, the WB and WHO among others. The results have been greatly encouraging.

The 2007 Malaria Indicator Survey (MIS), conducted between October and December 2007 - well before all our scale-up targets had been reached - documented that overall coverage of bednets increased 15-fold, with 69% of households in malarious areas protected by at least one net and/ or IRS. Further, bednet use by children under five and pregnant women had increased to nearly 45% in malarious areas and to over 60% in households that owned at least one net. Moreover, we expect that these figures have improved considerably over the last year given that overall number of nets distributed throughout the country had reached 20.4 million as of the end of December, 2008. Furthermore more than 11.2 million LLINs have been replaced in 2010 and additional 7 million will be replaced before the end of this year. Our 'integrated health systems' approach to malaria control which has been the engine of this successful scale-up effort has proven to be a high return investment. The challenge now is to sustain and build on this substantial progress. To this end, this new National Strategic Plan for 2011-2015, which is the updated version of the 2010-2015 national strategic plan aims to consolidate the gains made through the preceding strategy and to sustain its impacts. This overall goal will be attained through the implementation of core four components which form the main strategic thrusts of the Strategy. Vigorous community mobilization will be the energy for driving this bold Strategic Plan forward in order to reach the highest targets for prevention to be further bolstered by aggressive environmental vector control methods as well as prompt and accurate diagnosis and case management. Indeed, we are confident that this tremendous resource will also catalyze closer and more effective collaboration with our counterparts across all other sectors, including, in particular the water, agriculture, infrastructure and communications sectors.

The Strategy also assigns top priority to the building of a robust and active surveillance and epidemic control system - one which will help us actively detect and respond to outbreaks, to diagnose and manage individual cases and track the speed of our progress with increasing precision. These core strategic components will be backed by a four-pronged 'system strengthening and capacity building' strategy, focusing on: monitoring and evaluation, human resources development, targeted operational research and effective financial management.

The development of this strategy by revising the 2010-2015 strategy was made due to new developments in malaria control efforts, including introduction of artesunate suppository as a pre-referral treatment for severe cases; initiation of external quality assurance system for malaria microscopy; a high level of resistance of the local vector to commonly used DDT; and additionally to align the strategy with the 2011-2015 health sector development programme (HSDP IV).

The 2011-2015 national strategy plans towards achieving elimination in areas with historically low malaria transmission and near zero malaria deaths in all other parts of the country by 2015.

It is an ambitious plan but one that we are confident can be achieved given the unprecedented global momentum on malaria and the strong and sustained support we have been receiving from our partners. It is my firm conviction that implementation of this strategy will place Ethiopia on firmer footing towards achieving all the health MDGs and striking malaria off its list of leading health problems once and for all.

Dr. Tedros Adhanom Ghebreyesus

Minister of Health of the Federal Democratic Republic of Ethiopia

Acknowledgements

This Strategic Plan is the revised version of the 2010-2015. The revision of the strategy made possible through a highly collaborative and well-concerted team effort involving the participation of a wide diversity of professionals from a host of partner institutions. The process was steered by the Federal Ministry of Health (FMOH) under the dedicated leadership of the Hon. Minister Dr. Tedros Adhanom Ghebreyesus, in continual consultation with numerous staff across a number of other units which make up Ethiopia's decentralized national health system. Dr. Kesetebirhan Admassu, Director General, Health Promotion & Disease Prevention - HPDP.

The Ministry would like to thank all who directly and indirectly contributed towards realization of the 2011-2015 national strategy document for malaria. The members of the technical advisory committee (TAC) deserve special acknowledgment for their prompt action in reviewing and updating the strategic plan for malaria.

Executive Summary

Ethiopia was one of the first countries to embrace the Scaling Up for Impact (SUFi) concept for malaria control. The 2006-2010 National Strategic Plan aimed to rapidly scale-up malaria control interventions to achieve a 50% reduction of the malaria burden, in line with RBM objectives. The status of coverage of the major interventions was measured in the 2007 Malaria Indicator Survey (MIS), conducted from October through December 2007. Even though the scaling-up of all interventions wasn't complete at the time the MIS was conducted, the results show the tremendous achievements of Ethiopia's malaria control programme: between 2005 and 2007, ITN coverage increased 15-fold. Sixty nine percent (69%) of households in malarious areas were protected by at least one ITN, and ITN use by children under five and pregnant women increased to nearly 45% in malarious areas and to over 60% in households that owned at least one net. Health facilities are reporting sustained reductions in both cases and malaria-related deaths, even during the height of the transmission season.

The 2011-2015 National Strategic Plan is the updated version of the 2010-2015 national malaria strategic plan. It is based on a strong collaboration between all actors that contribute in the fight against malaria in Ethiopia. In August 2008, Ethiopia signed a compact with development partners on Scaling Up For Reaching the Health MDGs through the Health Sector Development Programme as part of the International Health Partnership. This strategy falls in line with a core component of these agreements— the vision of one plan, one budget, and one report based on FMOH led processes— and will be included as part of the larger health sector development strategy.

With resources secured to support universal coverage of key malaria interventions by the end of 2010, Ethiopia will move from SUFI to sustained control, as key steps in the process towards malaria elimination by 2020. The 2011-2015 National Strategic Plan (NSP) will build on the achievements of 2006-2010 strategic plan, and, through sustained control, will move towards malaria elimination through an integrated community health approach, especially in areas of unstable malaria transmission. This will be achieved through continued provision of malaria prevention methods (LLINs and IRS), increased diagnosis and case detection, increased access to treatment, and will only be possible as part of a community mobilization effort.

The specific goals of the NSP are:

- By 2015, achieve malaria elimination within specific geographical areas with historically low malaria transmission
- By 2015, achieve near zero malaria death in the remaining malarious areas of the country

The NSP provides a detailed account on the status and direction of the major malaria prevention and control strategies that include community empowerment and mobilization, early diagnosis and treatment, selective vector control, surveillance and epidemic control, as well as supporting strategies that include Monitoring and Evaluation, human resources development and operational research.

Component 1: Community Empowerment and Mobilisation

Community empowerment and mobilization are central to malaria prevention and control. Ethiopia's Health Extension Programme educates, mobilizes and involves the community in all aspects and stages of malaria control and leads to increased ownership of the programme. The objectives of component 1 are: 1) 100% of people living in malarious areas recognize the importance of using an LLIN, having their house sprayed, seeking treatment within 24 hours of fever onset for the prevention of malaria and 2) 100% of health posts in malarious *Kebeles* provide the full health extension package including outreach services, social communication and mobilization and model family households.

Component 2: Diagnosis and Case Management

Since 2007, there has been a major shift from clinical diagnosis to confirmatory diagnosis following the wide-scale use of RDTs in peripheral health facilities. To improve the quality of malaria diagnosis and treatment at peripheral health facilities (health posts) pan specific RDTs are now being introduced. HEWs will be trained on the use of multi-species RDTs in the integrated refresher training (IRT). Treatment seeking behaviour of the population is persistently low. The 2007 National Malaria Indicator Survey (2007 MIS) revealed that overall, 22.3% of children under age five years reported a fever in the two weeks preceding the survey, of whom 15.4% sought medical attention within 24 hours of onset of fever.

The objectives of component 2 are: 1) 100% of suspected malaria cases are diagnosed using RDTs and or microscopy within 24 hours of fever onset; 2) 100% of positive malaria diagnosis is treated according to national guidelines and 3) 100% of severe malaria cases are managed according to national guidelines.

Component 3: Prevention

The two main major vector control activities implemented in the country are IRS and LLINs. The 2007 MIS showed significant improvements in LLIN ownership in malaria risk areas from 3.5% in 2005 (DHS 2005) to 65.6% in 2007 (MIS, 2007). It appears the more than 20 million LLINs that have been distributed to 10 million families have contributed to the reduction of malaria, and the strategies and activities required to implement this have now been tried and tested. The objective of this component is to ensure that 100% of households in malarious areas own one LLIN per sleeping space, and that at least 80% of people at risk of malaria use LLINs. This will be achieved by both covering the existing gap (catch-up) and replacing worn out nets (keep-up), geographically targeting households in need. IRS is currently targeted to cover epidemic-prone areas and malaria-affected communities with low access to the health care system. Despite a dramatic scale-up of IRS activities, the FMOH estimates that 55% of

IRS-targeted areas have been sprayed. This Strategic Plan aims at increasing and maintaining IRS coverage to 90% of households in IRS-targeted areas. Geo-coding activities will help determine the quantity, quality, and location accessibility of human habitations, as well as measure sprayable surfaces within a specific area.

Component 4: Active Surveillance and Epidemic Control

As the nation, the regions, and sub-regions seek to reduce malaria transmission to zero, the very high coverage (seeking universal coverage) of prevention interventions (LLINs, IRS) will serve to limit transmission in communities and will mean that there is very little potential for “epidemics” or “outbreaks”; that is, there is very low likelihood that a single introduced infection would expand to many infections/cases. Thus, the national emphasis on further reducing transmission will rely on the existing prevention coverage and additionally focus on “surveillance” - the process of finding of individual human cases, treating and performing case investigation to identify the source and possible spread, with the aim of preventing any further malaria transmission. Therefore, this NSP aims to achieve a high quality, broadly based malaria infection detection, investigation and response ‘Surveillance System’ to further reduce malaria transmission and improve the detection and timely response to malaria epidemics.

Cross-cutting activities will support the above-described strategies:

Monitoring and Evaluation activities, described in the Malaria Program M&E Plan, will measure program effectiveness. The M&E system will be used to demonstrate that the Malaria Program efforts have had measurable sustained impacts on the outcomes of interest. Monitoring will entail the routine tracking of the key elements of programme performance through record keeping, regular reporting from the health information system (HMIS), surveillance systems and periodic surveys. Monitoring will be used to verify step-by-step the progress of the malaria control program activities in order to make sure activities have been implemented as planned, ensure accountability, detect problems and constraints related to the intervention activities, and promote evidence-based planning through timely feedback to the relevant authorities.

Development of Human Resources, with emphasis on frontline and middle level professionals, is one of the priorities identified by the Health policy of Ethiopia as well as in the successive phases of HSDP. Ethiopia is addressing human resources (HR) development through: rapid scale up of HR; prioritizing primary and mid-level training; and ensuring the quality of training so as to make it of acceptable professional standards. Activities will be aimed at improving HEW training capacity (strengthening pre-service training and Integrated Refresher Training (IRT) and supporting HEWs during apprentice training) and improving HEW supervision support (strengthening training of newly appointed HEW supervisors and procuring motorcycles for HEW supervisors to ensure continuous and timely supervision).

Acronyms

ACT	Artemisinin-based Combination Therapy
AMREF	Africa Medical Relief Foundation
ARI	Acute Respiratory Infections
BPR	Business Process Reengineering
CCM	Country Coordinating Mechanism
CHWs	Community Health Workers
CRDA	Christian Relief and Development Association
CSRP	Civil Service Reform Program
DACA	Drug Administration and Control Authority
DHS	Demographic Health Survey
DSS	Demographic Surveillance Site
EC	Ethiopian Calendar
EHNRI	Ethiopian Health and Nutrition Research Institute
EOS	Enhanced Outreach Strategy
EPI	Expanded Program on Immunization
EQA	External Quality Assurance
FBOs	Faith Based Organizations
FMOH	Federal Ministry of Health
GDP	Gross Domestic Product
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOE	Government of Ethiopia
HEEC	Health Extension and Education Center
HEW	Health Extension Workers
HFP	Health Extension Program
HH	Household
HIPC	Highly Indebted Poor Countries
HIS	Health Information System
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMIS	Health Information Management System
HR	Human Resource
HRD	Human Resource Development
HRDS	Human Resource Development Strategy
HSDP	Health Sector Development Program
ICCM	Integrated Community Case Management
ICT	Information Communication Technology
IDSR	Integrated Disease Surveillance and Response
IEC/BCC	Information, Education, Communication / Behavioral Change Communication
IMF	International Monetary Fund
IMNCI	Integrated Management of Newborn and Childhood Illnesses

IPTi	Intermittent Presumptive Treatment for infants
IPTp	Intermittent Presumptive Treatment for pregnant women
IRS	Indoor Residual Spray
IRT	Integrated Refresher Training
ITN	Insecticide Treated Net
LLIN	Long Lasting Insecticidal Net
M&E	Monitoring and Evaluation
MACEPA	Malaria Control and Evaluation Partnership in Africa
MCST	Malaria Control Support Team
MERG	Monitoring and Evaluation Reference Group
MIS	Malaria Indicator Survey
MOE	Ministry of Education
MOF	Ministry of Finance
MPS	Making Pregnancy Safer
NGO	Non Governmental Organization
NMCP	National Malaria Control Programme
NSA	National Strategy Application
NSPMPC	National Strategic Plan for Malaria Prevention and Control
OR	Operational Research
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
PMI	President's Malaria Initiative
PSA	Pharmaceutical Supplies Agency
PSI	Population Service International
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
SNNPRS	Southern Nation, Nationalities and Peoples Regional State
SP	Sulphadoxine-Pyrimethamine
STI	Sexually Transmitted Infection
SUFI	Scaling Up For Impact
TAC	Technical Advisory Committee
TBA	Traditional Birth Attendant
TCC	The Carter Center
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VCHW	Voluntary Community Health Workers
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

Introduction

The malaria control support team (MCST) with leadership and coordination of the FMOH has developed the 2011-2015 national strategic Plan. Several partners contributed to this draft, including WHO, UNICEF, USAID-PMI, The Carter Center, The Earth Institute, MACEPA, Malaria Consortium, civil society and others. The MCST is an open forum which consists of all stakeholders involved in malaria control in Ethiopia including the FMOH, WHO, UNICEF, Malaria Consortium, MACEPA, The Carter Center, Centre for National Health and Development in Ethiopia, Coalition Against Malaria in Ethiopia (the umbrella organization for civil society in malaria), Coalition of Media against Malaria in Ethiopia, AMREF, Merlin, CORE/CRDA (Christian Relief Development), Net Mark, USAID/PMI, Ethiopia Malaria Control Professional Association and the Earth Institute.

The MCST requested its Technical Advisory Committee to update the strategic plan. Groups were established around specific technical areas. The documents developed by the committee were shared with all relevant partners.

The Strategic Plan presented here is therefore based on a strong collaboration between all actors of the fight against malaria in Ethiopia and it's the revised version of the 2010-2015 national strategic plan. It is a working document that will serve as a guideline for the period 2011-2015, and will be amended and updated as needed, based on outcomes of annual programme reviews.

Country Profile

Geography and Climate

Ethiopia, located in the North Eastern part of Africa, lies between 3 and 15 degrees north latitude and 33 and 48 degrees east longitude. The country has total area of 1.1 million square kilometers. Ethiopia's topographic features range from peaks as high as 4,550m above sea level to 110m below sea level in the Afar Depression. The Great East African Rift Valley divides the highland into two- the western and northern highlands and the southeastern. There are three broad ecological zones that follow the above topography. The "Kolla" or hot lowlands are found below an altitude of 1,000 meters (m), the "Weyna Dega" between 1000 and 1500m, and "Dega" or cool temperate highlands between 1500 and 3000m above sea level. Mean annual temperatures range from 10 to 16°C in the "Dega", 16 to 29°C in the "Weyna Dega" and 23 to 33°C in the "Kolla". In general, the highlands receive more rain than the lowlands, with annual rainfalls of 500mm to over 2000mm for the former and 300mm to 700mm for the latter¹.

Demography

A national population census was conducted in 2007 and the total population was estimated to be 79,835,354. At an annual growth rate of 2.6%, the population is expected to reach 81,911,074 by the year 2011 and 90,767,853 by the year 2015. Half of the population (49.5%) is female. The average household size is 4.7 persons. The majority of the population of Ethiopia (84%) lives in rural areas, making Ethiopia one of the least urbanized countries in the world. The structure of the Ethiopian population shows the dominance of the young as is typical of many developing countries: there are 10.5 million children under five years of age in Ethiopia, according to the 2007 census. The proportion of pregnant women was 3.6% in 2008².

Economy

Ethiopia's economy is based on agriculture, accounting for almost half of GDP, 80% of exports, and 80% of total employment. Exports are almost all agricultural commodities and coffee is the leading export commodity. Other export commodities include cut flowers, oilseeds, khat, gold, and leather products, while the main import commodities are petroleum and petroleum products, chemicals, machinery, and textiles. In recent years, however, the share of industries in the economy is growing. The leading industries include food processing, beverages, textile, leather, chemicals, metals processing and cement. The agricultural sector generally suffers from frequent drought and poor cultivation practices. The recurrent drought has buffeted the economy, in particular coffee production.

1 Tulu A.N. (1993): Malaria in Ethiopia. In The Ecology of Health and Disease in Ethiopia page 341-351, 1993.

2 www.CSA.gov.et

In November 2001, Ethiopia qualified for debt relief from the Highly Indebted Poor Countries (HIPC) initiative, and in December 2005 the IMF voted to forgive Ethiopia's debt. In the past few years, Ethiopia has recorded "impressive growth", according to a new IMF review, "the fastest for a non-oil exporting country in sub-Saharan Africa." In 2008, real GDP is expected to grow by an impressive 8.4 percent, slowing down to a strong 7.1 percent in 2009³.

Administrative structure

Ethiopia is a Federal Democratic Republic composed of nine Regional States (Tigray, Afar, Amhara, Oromia, Somali, Benishangul-Gumuz, Southern Nations Nationalities and Peoples (SNNP), Gambella and Harrari) and two City Administrations (Addis Ababa and Dire Dawa).

The National Regional States and City Administrations are further divided into Zones which are further divided into 736 *Woredas* (districts). A *Woreda* is the basic decentralized administrative unit and has an administrative council composed of elected members. The 736 *Woredas* are further divided into roughly 15,000 *Kebeles* (villages) organized under peasant associations in rural areas (10,000 *Kebeles*) and urban dwellers associations (5,000 *Kebeles*) in towns.

With the devolution of power to regional governments, public service delivery, including health care, has to a large extent fallen under the jurisdiction of the regional states. The approach has been to promote decentralization and meaningful participation of the population in local development activities. For administration of public health care at the regional level, there is a Regional Health Bureau (RHB). Due to the Government's commitment to further decentralize decision making power, *Woredas* are currently the basic units of planning and political administration.

General Health Profile

Ethiopia ranks 169 out of 177 on the Human Development Index, and 92 out of 95 on the Human Poverty Index. Pervasive poverty underpins the health and nutrition situation of most Ethiopian children. The table below shows health statistics for women and children in Ethiopia:

Under-five mortality rate	123/1000 live births
Neonatal mortality rate	39/1000 live births
Stunting in children under-five years of age (Height-for-age < -2SD)	46% (severely stunted < -3SD: 24%)
Acute malnutrition in children under-five years of age (Weight-for-height < -2SD)	11%
Infant Mortality	77/1000live births
Maternal Mortality Ratio	673/100,000 live births ⁴

³ "Ethiopia sees Africa's fastest growth" <http://www.afrol.com/articles/28991>

Total fertility rate	5.4
Delivery with skilled attendant	6%
Children< 6 months, exclusively breastfed	49%
2007 - DPT-HepB - Hib1 coverage	81.2% *
2007 - DPT1 - HepB - Hib coverage	72.6% *
2007 - TT2+ for Pregnant women	62.2% *

Source: DHS 2005, * Joint Reporting Format, FMOH-WHO-UNICEF, 2007

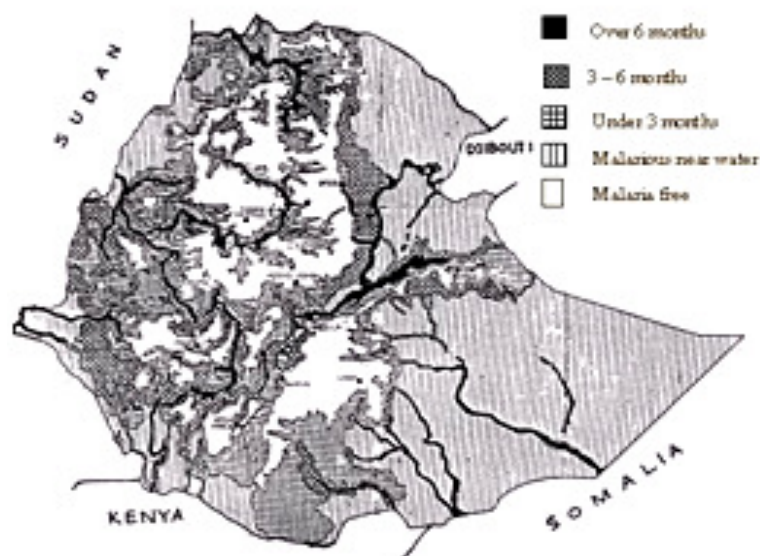
More than 374,000 children under the age of five die every year in Ethiopia (DHS Survey Data, 2005) and 57 percent of those deaths are associated with malnutrition. It is estimated that more than 280,000 children under five years old are suffering from severe acute malnutrition in Ethiopia (DHS, 2005), 30 to 50 percent of which will die if not treated. Approximately 400,000 pregnant and lactating women are also suffering from malnutrition leading to low birth weight and child malnutrition.

In September 2004, the first draft of the National Child Survival strategy document was produced by the Federal Ministry of Health (FMOH). The strategy addresses the major conditions that account for 90% of child mortality (ARI with pneumonia, malaria, diarrhea and neonatal conditions), malnutrition and HIV/AIDS, the two most significant underlying causes of death. The strategy is comprehensive and it addresses the causes of neonatal mortality and to a certain extent the causes of maternal mortality (such as poor nutrition and very high fertility rates).

Malaria Epidemiological Profile

Malaria transmission exhibits a seasonal and unstable pattern in Ethiopia, with transmission varying with altitude and rainfall. The major malaria transmission season in the country is from September to December, following the main rainy season from June/July to September. There is a shorter transmission season from April to May following the shorter rainy season in some parts of the country. Currently, areas <2,000 meters of altitude are considered malarious. A risk-mapping exercise is about to take place in Ethiopia to refine this definition (see below).

Map 1. Duration of Malaria Transmission



The following map (Figure 1) shows the duration of malaria transmission within the country.

Figure 1: Duration of malaria transmission, Ethiopia

Ecological factors

Malaria transmission intensity, along with its temporal and spatial distribution in Ethiopia, is mainly determined by the diverse eco-climatic conditions. Climatic factors including rainfall, temperature and humidity show high variability. Temperature, and to a lesser extent rainfall and humidity, varies as a function of altitude. In general terms, 75% of the landmass of Ethiopia is considered at risk of malaria, which corresponds to areas below 2,000m altitude (see Figure 1). However, this estimate has not recently been revised to account for possible changes such as urbanization or land use (irrigation or dams).

Mean annual precipitation, in general, ranges from 800 to 2,200mm in the highlands (>1,500m) to less than 200 to 800mm in the lowlands (<1,500m). Rainfall decreases northwards and eastwards from the high rainfall pocket area in the southwest, and seasonality is not uniform. The following general patterns are seen:

- The western half of the country has two distinct seasons (i.e. 'wet' from June-September and 'dry' from November-February), with a rainfall peak occurring in July and August.
- The central and most of the eastern part of the country have two rainy periods (i.e. from March-April and from July-September) and one dry period (i.e. from November-March)
- The south and southeastern parts of Ethiopia have two distinct dry periods (i.e. December-February and July-August) and two rainy seasons (i.e. March-June and September-November).

However, there is large variation from year to year and these general patterns are only discernible when a large number of years are considered.

Population at risk

It has been estimated that approximately 68% of the Ethiopian population live in areas <2,000m of altitude and, thus, are considered to be at risk of malaria. This long-standing estimate is in need of verification or updating with newer information, and a risk-mapping activity is currently being planned to address this need. Population movements (including urbanization) and prevention measures used may affect the accuracy of this estimate.

Currently, long-standing 'expert knowledge', based on classifying whether *Kebeles* are malarious or not, is used to decide on the targeting of intervention strategies, including bednets, indoor residual spraying (IRS) and drugs. This microplanning varies from region to region, and takes into account factors such as altitude, usual rainfall, expectation of malaria cases, proximity to breeding sites, and historical occurrence of outbreaks. Unlike large parts of SSA, due to the unstable and seasonal pattern of malaria transmission, the protective immunity of the population is generally low, and all age groups are at risk of infection and disease. Most malaria cases are observed in persons over five years of age, although children under five and pregnant women are most vulnerable to the severe effects of infection.

Species composition

Plasmodium falciparum and *P. vivax* are the most dominant malaria parasites in Ethiopia. They are prevalent in all malarious areas in the country with *P. falciparum* representing about two-thirds to three-quarters of the cases, although their relative composition can be variable. *P. malariae* and *P. ovale* are rare and account for <1% of all confirmed malaria cases. The major malaria vector incriminated in Ethiopia is *Anopheles arabiensis*; in some areas *A. pharoensis*, *A. funestus* and *A. nili* also transmit malaria⁴.

Malaria epidemics

Historically, the unstable nature of malaria transmission has been characterized by frequent focal and cyclical epidemics which reach national scale at irregular intervals of 5-8 years. In the Ethiopian highlands, several large-scale epidemics have been documented since 1958. In that year, an estimated 150,000 people died during a widespread epidemic of malaria in the highlands⁵. Several major epidemics have been reported since then. Abnormal transmission of unusual proportions affected the highlands and highland-fringe areas in 1988 and 1991-92, which was associated with abnormally increased minimum temperature⁶. In 1997-1998,

4 Ministry of Health: (Unpublished draft doc). Guideline for vector control, 1997

5 Fontaine, RE, Najjar, A E and Prince, J S. The 1958 malaria epidemic in Ethiopia. American Journal of Tropical Medicine and Hygiene 10, 795-803, 1961.

6 Abeku, TA, Van Oortmarssen, GJ, Borsboom, G, De Vlas, SJ and Habbema, JDF. Spatial and temporal variations of malaria epidemic risk in Ethiopia: factors involved and implications. Acta Tropica 87, 331-340, 2003.

widespread epidemics occurred in the highlands and, in the most recent national scale epidemic in 2003-2004, more than 2 million clinical malaria cases and 3,000 deaths were reported from 3,368 villages in 211 districts.

Malaria and the Broader Development Framework

Ethiopia developed its Poverty Reduction Strategic Paper (PRSP) in July 2002, currently known as the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP), on the basis of the Millennium Development Goals (MDGs) and the country's socio-economic development needs. PASDEP's vision is to increase growth of the economy at an average rate of 5.7% per annum until 2015 in order to achieve poverty reduction by 50%, as compared to the 2002 level.

The Highly Indebted Poor Countries (HIPC) initiative, endorsed by 180 governments, lobbies for the approval of debt relief to hasten investment needs of these countries. Debt relief is part of a comprehensive poverty reduction strategy comprising a range of policies aimed at improving social programmes, good governance and widely shared economic growth. Under HIPC, Ethiopia received a write-off of US\$ 1.3 billion in 2004 and US\$ 3 billion in 2006 to support its poverty reduction efforts. As the health sector is a major beneficiary from debt relief initiatives, malaria prevention and control efforts will be further strengthened and sustained.

The MDGs require countries to work together with their development partners to achieve specific targets by 2015. Ethiopia has prioritized an integrated approach to addressing the health related MDGs by working with partners to strengthen the overall health system. This approach requires a concentrated effort to meet the investment needs of the programme. A focus on achieving the priority target of halting malaria by 2015 can lead to gains in reductions in maternal health and child mortality (MDGs 4 and 5). Accordingly, the HSDP III and the 2006-2010 National Strategic Plan for Malaria Prevention and Control (NSPMPC) aim at achieving 100% access to malaria diagnosis and treatment by 2010 and 100% LLIN coverage in all targeted households by 2007 to significantly impact the malaria burden in the country. The interventions and services proposed in the previous NSP, as well as in this Strategic Plan, are closely linked to international and regional initiatives, including the Roll Back Malaria (RBM) partnership, the Integrated Management of Neonatal and Childhood Illnesses (IMNCI), and the Child Survival and Making Pregnancy Safer (MPS), through partnership with multilateral agencies (e.g. WHO, UNICEF) and bilateral donors.

Establishing an effective and responsive health service is an integral component of Ethiopia's national development policy, which aims at achieving significant economic growth and poverty reduction. In view of this commitment, the Government has decided to invest on health and adopted a sector-wide approach for the planning and implementation of health programmes to achieve the health development objectives of providing comprehensive,

integrated and cost-effective primary care services. The first and second sector wide programmes (HSDP I and II) were implemented from 1998 - 2002 and 2003 - 2005, respectively. HSDP III (2006-2010) currently provides the foundation for all health policy in Ethiopia. The HSDP IV will run from 2011-2015. This Strategic Plan will therefore align with national planning cycles. The objective of the HSDP is to provide comprehensive, integrated and cost effective primary care services, with a focus on communicable diseases, nutritional disorders, environmental health and hygiene, maternal and child health, reproductive health, immunization and the control of infectious diseases, such as ARI, malaria, and STDs, especially HIV/AIDS. The main strategies such as case management, epidemic prevention and control, vector control, malaria prevention and control in pregnancy, and pharmaceuticals are treated within the service delivery and quality of care, which is one of the essential components of HSDP. Other supporting strategies such as human resource development, information, education and communication, operational research, health management information system, and monitoring and evaluation associated with malaria are described in this document according to HSDP.

Malaria control has benefited and will continue to benefit from the overall health development activities implemented within all the HSDP phases. Crucial for the success of the HSDP is the Health Extension Programme (HEP). The HEP provides promotive and preventive health care services to every rural *Kebele* in the country through the construction of a health post in each of those *Kebeles*. Health extension workers (HEWs) are posted as salaried government staff to the health posts after one year of basic training. To date, all 30,000 HEWs have been trained and posted. They deliver health care services for an integrated package of 16 health priorities⁷. Specifically, HEWs provide diagnosis and treatment of malaria with RDTs and ACTs, support LLIN distribution and follow-up and coordinate IRS activities at the community level. They are also at the frontline of recognizing and reporting localized malaria outbreaks.

Ethiopia has a policy to provide the main malaria prevention and control services free of charge. Hence, the malaria risk population has the right to get malaria diagnosis and treatment as well as mosquito nets free of charge. Localities targeted for IRS of their houses also receive it free of charge. This policy has ensured accessibility of the poor to malaria interventions and, hence, protection from malaria to increase household economic productivity.

⁷ **Disease prevention and control:** HIV/AIDS and STIs, TB, malaria; **Family health:** maternal and child health, family planning, immunization, nutrition, adolescent reproductive health; **Hygiene and Environmental sanitation:** excreta disposal, solid and liquid waste disposal, water supply and safety measures, food hygiene and safety measures, healthy home environment, control of insects and rodents, personal hygiene, first aid and emergency measures.

Scaling up Malaria Interventions

Planning for scaling-up malaria prevention and control interventions started in 2003 with the support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) Round 2. In July 2004, the Federal Ministry of Health (FMOH) introduced Artemisinin-based combination therapy (ACT) as the first line drug against *P. falciparum* malaria and rapid diagnostic tests (RDT) to improve diagnosis. At the same time, the FMOH decided to introduce long-lasting insecticidal nets (LLINs) as a method of malaria prevention and control. Major scale-up began in earnest in the third quarter of 2005 with wide distribution of rapid diagnostic tests (RDTs), ACTs, LLINs and IRS, with support from GFATM Rounds 2 and 5, The Carter Center (TCC), the United Nations Children's Fund (UNICEF), the United States Agency for International Development (USAID), and the World Health Organization (WHO).

The interventions were targeted to suit local epidemiological situations, with case management being strengthened in all malarious areas, while LLINs were primarily targeted to all age groups for areas below 2000m altitude and IRS targeted epidemic-prone areas up to 2500m of altitude.

The main aim of the scaling-up of the interventions was to achieve the goal and objectives set for the four major areas of intervention in the previous five years strategic plan (2006-2010).

MIS findings

The status of coverage of the major interventions was measured in the 2007 Malaria Indicator Survey (MIS), conducted from October through December 2007 (i.e. during the main malaria transmission season). The following table summarizes the main findings of the MIS. Even though the scaling-up of all interventions wasn't complete at the time the MIS was conducted, the results show the tremendous achievements of Ethiopia's malaria control programme: between 2005 and 2007, ITN coverage increased 15-fold (over 95% of the nets in Ethiopia are long-lasting insecticidal nets). 68% of households in malarious areas were protected by at least one ITN and/or IRS. ITN use by children under five and pregnant women increased to nearly 45% in malarious areas and to over 60% in households that owned at least one net. At the time of the survey, parasite prevalence was very low (0.7% in malarious areas) and similar across age groups. Improvements in diagnosis and treatment were modest, but 43% of children who took an anti-malarial in the two weeks preceding the survey had been given the recommended ACT.

Table 1: Main coverage indicators, Ethiopia, DHS 2005 and MIS 2007

	DHS 2005	MIS 2007	
		National	Malarious*
% of HH with at least one net (any net)	5.7%	55.7%	69%
% of HH with at least one ITN	3.4%	53.3%	66%
% use of nets (any nets) by children under five	2.3%	34.7%	44%†
% use of ITNs by children under five	1.5%	33.1%	42%†
% use of nets (any net) by pregnant women	1.6%	36.7%	44%†
% use of ITNs by pregnant women	1.1%	35.2%	43%†
% of children who had a fever in the two weeks preceding the survey	18.7%	22.3%	24%
% of children with a fever who took an anti-malarial (within 24 hrs)	3% (0.7%)	9.5% (3.9%)	12% (5%)

* “malarious areas” defined as areas <2000 meters elevation; 2005 DHS did not include this measure.

† among those in HH with a net, net-use rates for children or pregnant women was 55-65%.

The main areas addressed in the previous strategic plan were:

Early Diagnosis and Treatment: With a goal of providing 100% access to effective and affordable malaria treatment, the main approaches included improving diagnosis of malaria cases using microscopy and RDTs, and providing prompt and effective treatment of cases. The ACT Artemether-lumefantrine is used to treat *P. falciparum*, chloroquine *P. vivax*, and quinine is used for the treatment of severe malaria, pregnant women in the first trimester, children <5kg, and/or first line treatment failures. Laboratory diagnosis using microscopy is done at hospitals and health centres. Even though there has been rapid expansion of health centres and hospitals in efforts to improve access, it is estimated that only 30% of the population has access to microscopy-based malaria diagnosis. With the establishment of the HEP, most diagnosis and treatment of uncomplicated malaria is now carried out at community level through the HEWs, using RDTs. Between 2005-2009, almost 25 million RDTs and treatment courses of ACTs were procured and distributed to all health facilities in malaria risk areas.

Intermittent presumptive treatment for pregnant mothers (IPTp) and infants (IPTi) is not included as an approach in the malaria prevention and control strategy in Ethiopia as the rate

of placental parasitemia is found to be low⁸ and malaria transmission is largely unstable. To protect pregnant mothers and under five children, other protective measures, such as use of LLINs and early diagnosis and prompt treatment are recommended.

Selective vector control: The goal was to obtain and maintain 100% coverage of all households in malarious areas with, on average, 2 LLINs per household. IRS coverage was targeted to reach 60% in epidemic-prone areas. Since 2005, more than 20 million LLINs have been distributed and 30% of IRS targeted areas were estimated to have been sprayed in 2007⁹.

Epidemic Prevention and Control: This strategy is directed towards forecasting of malaria epidemics, early detection to prevent spread of epidemic outbreaks, and rapid and effective response to them. The goal was, according to the standard WHO recommended indicator, to achieve early detection and 80% containment of malaria epidemics within 2 weeks of onset¹⁰. There was a large epidemic in 2003, but since then, no major outbreaks have been reported. Government pre-positioning of emergency supplies allows rapid response during epidemic situations with IRS as the key prevention intervention.

Support strategies:

To support the implementation of these essential interventions and to ensure their appropriate utilization, supporting strategies including Human Resources (HR) development, IEC/BCC, M&E and operational researches were also implemented. Under IEC/BCC, the aim was to provide 100% of households with targeted IEC on all key malaria messages to increase utilization of interventions.

Gaps and weaknesses

The following weakness and gaps in intervention scale-up were identified based on the MIS 2007 report and previous FMOH-led programme assessments:

Under-utilization of interventions: Although the ITN utilization rates reported in the MIS 2007 for children under five and pregnant women are among the highest in malarious countries throughout Africa¹¹, they remained below the RBM target: 60% of children under five and 65% of pregnant women reported having slept under an ITN the night preceding the survey in households that owned at least one ITN (in areas below 2,000m altitude). In addition, access to and use of anti-malarial treatment for fever episodes remained low. This may be due to lack of access to health facilities in some regions and/or poor understanding of

8 Newman, R. D. et al, Malaria during Pregnancy in Areas of Unstable Transmission, The Journal of Infectious Diseases 2003; 187:1765-72

9 Proceedings of the Annual Review Meeting on Malaria Control and Prevention in Ethiopia, FMOH, April 2008

10 WHO: Implementation of the Global Malaria Control Strategy 1993-2000

11 Malaria and Children: Progress in Intervention Coverage: Updated Summary for World Malaria Day 2009 UNICEF and Roll Back Malaria Partnership (RBM) joint report, 2009.

the causes of fever and the danger of malaria. It is also important to note that interpreting malaria treatment data from population-based household surveys is complex, particularly in areas experiencing significant declines in the number of malaria cases due to scaling-up prevention measures and when diagnostics become more widely available. In these areas, measuring treatment among all febrile children is less useful for monitoring the success of programmes that are better targeted toward treating only confirmed cases. The RBM Monitoring and Evaluation Reference Group (MERG) therefore recommends that the proportion of children under the age of five with a fever in the two weeks preceding the survey that were given a finger- or heel stick be measured. This indicator is taken into account in this Strategic Plan (see Case Management component). The MIS 2007 also showed that only 44% of women aged 15-49 recognize fever as a symptom of malaria and < 5% reported IRS as an effective means of protection against malaria. These results may be due to the limited malaria BCC activities that have been implemented since 2005, which did not match the scale-up of main malaria commodities such as LLINs, RDTs and ACTs. The financial, logistical and infrastructure resources allocated for BCC activities were not aligned with the effort needed for comprehensive and long-term behaviour change¹².

Monitoring and evaluation system. Currently, the established system does not provide sufficient, quality and timely data, and therefore has not enabled the Malaria Programme to determine coverage or quantify needs of malaria prevention and control interventions. Additionally, the lack of a comprehensive commodities tracking system to monitor procurement, distribution and stock levels of main malaria commodities, including LLIN, RDTs, ACTs and insecticide for IRS has hampered planning, renewed commodity procurement and distribution as well as programme M&E. These weaknesses have been recognized and are addressed in the GFATM Round 8 proposal.

Gaps in service delivery:

LLINs: Following the successful scale-up of LLIN distribution to provide 100% of households with an average of two LLINs each, there is now a need to develop a net replacement strategy. In addition, the number of households in need was underestimated, and some nets were distributed to areas with little malaria. This gap was taken into account in the Global Fund Round 8 proposal and the need for additional LLINs partially addressed. The national LLIN strategy has been updated and now includes a replacement strategy and a targeted distribution strategy¹³.

IRS: The previous Strategic Plan aimed to cover at least 60% of households in epidemic-prone areas (where 44.2% of the total population lives) by 2010. The MIS results showed that only

¹² It is also important to note that the total adult literacy rate is approximately 38%, which may also affect take-in of IEC/BCC messages by the population

¹³ Geographical targeting will be based on all *Kebeles* identified as malaria affected. The majority of these *Kebeles* lies below 2,000 meters altitude, although those above this altitude and subject to epidemic outbreaks will be targeted as well.

14% of households had been sprayed in the past 12 months. Even though this is a national percentage, the FMOH estimates that at best 30% of households in IRS target areas were sprayed in 2007-2008, largely due to a lack of funds available for this activity. The Global Fund Round 8 proposal includes a substantial budget for IRS activities (nearly 35% of the overall budget) and aims to cover at least 90% of households in epidemic-prone areas by 2013.

Supply of diagnostics: microscopes have been provided to most of the newly constructed health facilities through government and partner support, but because the coverage of hospitals and health centres in Ethiopia is low, only an estimated 30% of the population has access to microscopic diagnosis for malaria. The RDTs used to date do not detect *P. vivax* infections, which compromises adherence to the test results and, in turn, leads to misuse of anti-malarial treatments. Therefore multi-species RDTs are endorsed by the Ministry for use in Ethiopia. HEWs have been trained on the use and interpretation of results of multi-species RDTs.

Health System weaknesses:

There are critical health system bottlenecks that have constrained effective programme scale-up and sustainability including limited and inequitably distributed service access and quality, and critically low HR capacity. The lack of an effective Health Management Information System (HMIS) and M&E system hampers evidence-based programme decision-making. Lastly, service delivery of health commodities is significantly constrained by a lack of sufficient transport resources.

Human resource (HR) issues: A key issue facing the health sector is the shortfall of professional providers with the overall availability of health sector HR less than 0.4/1000 population for the year 2007, which is far below the 2.28/1000 required to reach high coverage of services required to achieve MDGs. The ratio of physicians (1:42000) and nurses (1:4200) to the population is less than a third of those recommended by WHO. The government has established a strong HR policy foundation for improving this crisis with its health sector Human Resource Development Strategy (HRDS) and the Civil Service Reform Programme (CSRP), with the major objective of training and supplying qualified health workers at all levels. A key example is the focus on HEWs to carry out an integrated set of community-based health services including malaria diagnosis and treatment that in past relied on health centre staff. As a result of strong FMOH and donor support, new training programmes have been expanded with revised materials and curricula, and the number of graduating health HR has significantly improved. The number of health workers trained in 2003/04 increased by nearly 64% as compared to 2002/03. Similarly, the number of physicians, nurses and laboratory technology graduates increased by 59%, 81% and 101%, respectively, between 1996 and 2004.

Health Information Systems (HIS) and Monitoring and Evaluation (M&E): One of the key constraints is the lack of reliable, timely information on programmes for decision-making. An assessment conducted by John Snow Inc in 2006 indicated incompleteness and inconsistency

of reports as well as limited use of available data at facility and lower level; the latter was primarily due to data overburden, lack of standardized systems and lack of dedicated health information officers at health facility and district levels with the capacity to analyze available data. Major steps have been taken in terms of the standardizing, simplifying and integrating the existing programme-oriented, parallel system into a single data channel. The design and pilot stage of the HMIS reform was completed by September 2007. An evaluation of the HMIS conducted in October 2007 by the stakeholders concluded that the new system had been effective in improving the quality of data generated, and the frequency of reporting. However, significant challenges still persist in the areas of HIS infrastructure including information and communication technology (ICT), and private sector/NGO participation. The goal is to have a single reporting format that embraces the needs of the diverse stakeholders in the health sector and improves access to health information nationwide for the three diseases.

Service delivery infrastructures: The government has initiated an accelerated expansion of health facilities in order to ensure 100 % health coverage by the end of 2010 including building of 2,240 new health centres. Additionally, significant resources have been mobilized to improve other infrastructures that will impact service delivery such as improving storage, logistics and upgrading health stations to health centres. The weaknesses in logistic and supply management are being addressed primarily through implementation of the Master Logistics Supply Plan and establishment of the PFSA, which will improve the management of planning and overall management of health supplies to health facilities across the country. Despite this, significant gaps still exist in transport networks (especially at lower levels), supply logistics and related services, which weaken the quality and outcome of services provided. Filling this gap will go a long way in strengthening and further decentralizing existing services, and help to link with community-based services in the catchment areas.

Trends in the Burden of Malaria

Malaria is a significant impediment to social and economic development in Ethiopia. In endemic areas, malaria has affected the population during planting and harvesting seasons, cutting down productive capacity at a time when there is the greatest need for agricultural work. The disease has also been associated with loss of earnings, low school attendance, and high treatment cost. During epidemics, health facilities are overwhelmed with patients and many resources are diverted to deal with the emergency.

There are several methods used for estimating the burden of malaria morbidity and mortality in Ethiopia, including cross-sectional surveys, routine surveillance data including incidence, case fatality ratios, health facility based surveys, and special longitudinal studies. As unbiased estimates of malaria morbidity and mortality are difficult to ascertain in the population, the most robust picture of the burden of disease emerges from assessment of all of these sources combined.

One of the most valid and unbiased proxy measures of malaria morbidity is parasite infection prevalence in the population obtained from population-based surveys. Some small-scale population-based surveys in the 1990s showed that malaria parasite prevalence ranged from 10.4-13.5% in Gambella¹⁴ to 7.6-14.1% in Tigray¹⁵ in all age groups. More recently, a household survey conducted by The Carter Center (TCC) in three regions in 2006/2007 showed a prevalence of 4.1% (4.6% in Amhara, 0.9% in Oromiya, and 5.4% in Southern Nations, Nationalities, and People's Region)¹⁶. The 2007 MIS then showed that malaria parasite prevalence was <1% in malarious areas. Such declines in malaria parasite prevalence appear to coincide generally with ITN scale-up.

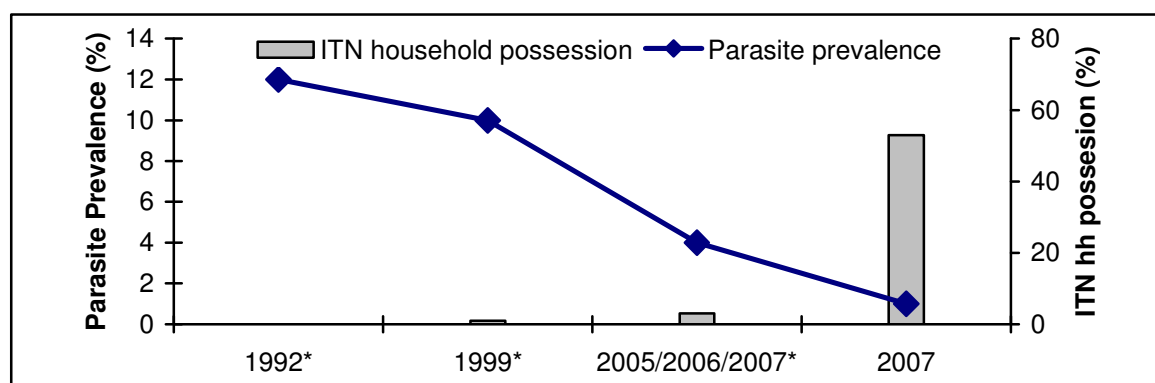


Figure 2: Malaria prevalence and ITN household possession in Ethiopia 1992-2007

Note: household coverage for 1992 and 1999 is estimated to be below .2% as the 2000 EDHS showed ITN possession to be .2%. ITN coverage estimate for 2005/2006/2007 is from 2005 EDHS.

The data items available under the old HMIS system by year and region include the reported number of clinical (fever) cases, the number tested for confirmation of malaria diagnosis, the number of confirmed malaria cases by species, the ranking of malaria in the top ten causes of morbidity (outpatient and inpatient) and mortality, and the proportional morbidity and mortality. Figure 3 shows the annual number of reported confirmed cases and incidence rate for the last 9 years from HMIS data, as reported in the FMOH annual reports. It should be noted that the observed increase in confirmed cases in 2007-2008 likely coincided with increased access to health services through the HEP, as well as increased diagnostic capacity at all levels of the health system.

14 Nigatu, W. et al. *Plasmodium vivax* and *P. falciparum* epidemiology in Gambella, south-west Ethiopia. *Trop Med Parasitol.* 43 (3): 181-5 (1992).

15 World Health Organization (WHO). The Community-Based Malaria Control Programme in Tigray, Northern Ethiopia: a Review of Programme Set-up, Activities, Outcomes and Impact, Malaria Control Department, Health Bureau, Tigray, Ethiopia, 1999.

16 The Carter Center, Prevalence and risk factors for malaria and trachoma in Ethiopia: A household survey in Amhara, SNNPR, and Oromiya Regional States. Addis Ababa, August 2007

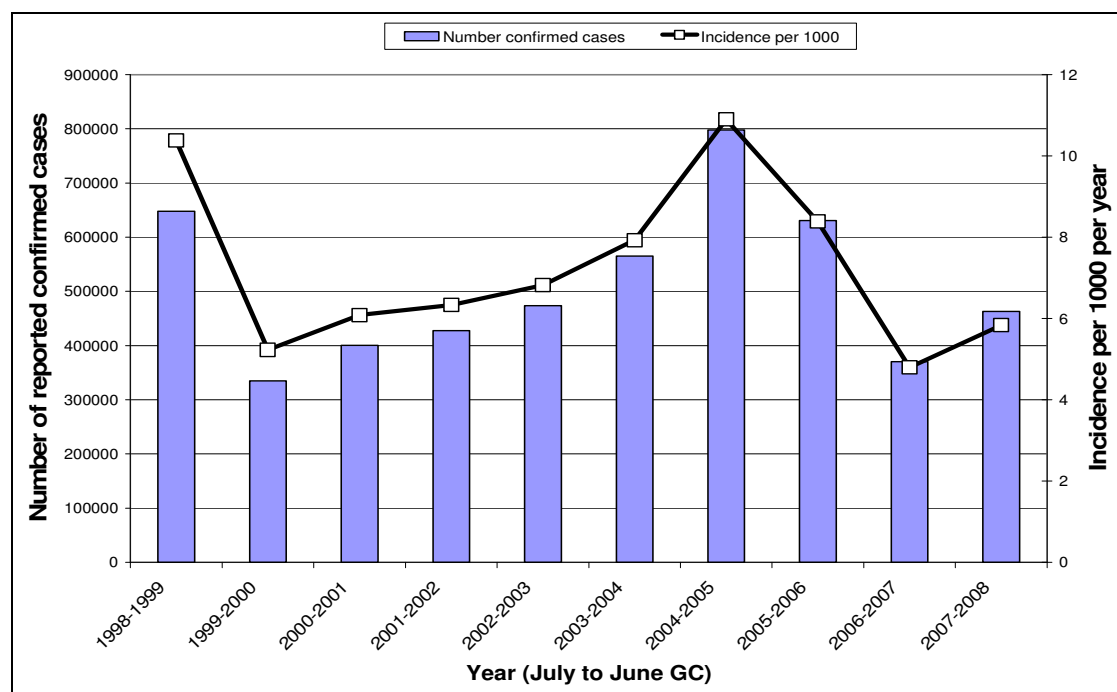


Figure 3: Ethiopia annual number and incidence /1000 population of reported confirmed malaria cases, 1998-1999 to 2007-2008, Ethiopia, Health and Health Related Indicators Annual Reports.

A recent WHO assessment¹⁷ on the impact of LLINs and ACT scale-up using a sample of health facility data showed a marked reduction in malaria cases and deaths over the last few years. The weighted average decline for malaria cases and deaths in all ages between 2001-4 and 2007 was 53% and 55%, respectively, while non-malaria cases increased by 14% and non-malaria deaths declined by only 8%.

The only current source for information on malaria epidemics is the malaria information system, which is being phased out under the HMIS reform. However, information for the last few years is available. During 2003 to 2005, a peak of transmission with high case fatality ratio was observed^{18,19}, particularly in the Oromiya, Amhara, Tigray, and SNNP regions. This widespread epidemic affected over 3,689 villages in about 211 districts with more than 2 million reported cases and 3,000 deaths. The progressive increase in the annual trend of malaria may have been related to widespread decline in the efficacy of the anti-malarial drugs (SP)²⁰ and the low coverage of preventive interventions such as IRS and ITNs that

17 <http://www.who.int/malaria/docs/ReportGFImpactMalaria.pdf>

18 Guthmann JP, et al., Death rates from malaria epidemics, Burundi and Ethiopia. *Emerg Infect Dis.* 2007 Jan;13(1):140-3

19 Checchi F, et al., Malaria epidemics and interventions, Kenya, Burundi, southern Sudan, and Ethiopia, 1999-2004. *Emerg Infect Dis.* 2006 Oct;12(10):1477-85

20 Jima D, et al., Efficacy of sulfadoxine-pyrimethamine for the treatment of uncomplicated falciparum malaria in Ethiopia. *East Afr Med J.* 2005 Aug;82(8):391-5.

reached only 20% of the population at risk at that time. However, the combined improvement in coverage of essential interventions since 2005 has coincided with reductions in the number of malaria epidemic episodes and affected villages (Figure 4), although reporting of such epidemics has probably also declined.

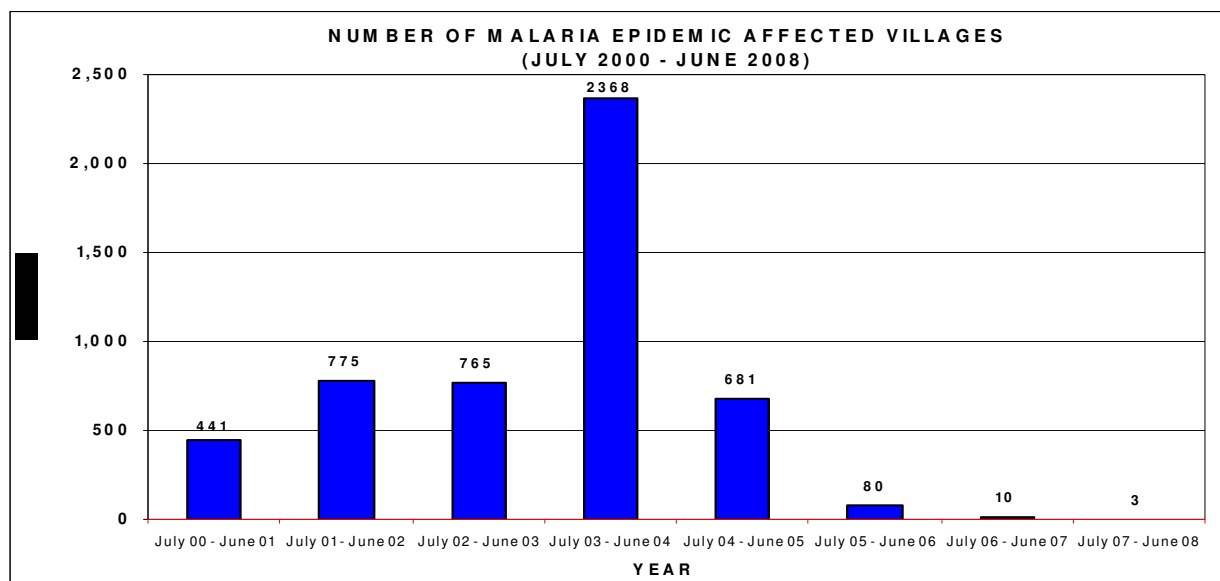


Figure 4: Number of malaria epidemic-affected villages 2000-2008

From the available data it appears there has been a general decline in the burden of malaria morbidity and mortality coinciding with the scale-up of the MPCP since 2005. As the Malaria Programme moves from scale-up to sustained malaria control, it will be critical to continue to measure malaria morbidity and mortality, if at all possible at the population level, to ensure previously achieved declines in malaria are sustained.

Institutional Framework and Responsibilities

The Malaria Programme operates within the regular framework of government structure and procedures. The programme functions in line with the National Health Policy of 1993, the Health Sector Strategy of 1995 and HSDP IV (2011-2015).

Policy Environment

As discussed above, the health sector programme in Ethiopia is guided by a twenty-year health sector development programme (HSDP) that was first launched in 1997.

Responsibilities

Full implementation of the five-year NMPCSP requires active involvement and participation of all partners from central to community level. The health care system of Ethiopia follows the federal structure, with the federal Ministry of Health at the apex. The FMOH, in collaboration with the Malaria Control Support Team, conducts annual review meetings of the Malaria Prevention and Control programme. These meetings gather both federal and regional staff, as well as partners. They are a forum to review the achievements of the programme and an opportunity to amend the Strategic Plan if needed. The proceedings of the 2008 Annual Review Meeting are annexed to this Strategic Plan.

Community Level: The active involvement of the community in planning and implementing all control activities has been a crucial component of the malaria strategy and will be strengthened going forward. In this process, CHWs, traditional birth attendants (TBAs) opinion and religious leaders, agricultural development worker, teachers, women and youth associations, and community development organizations will all be involved in the provision of basic malaria prevention and control packages, under the leadership of HEWs and elected community (*Kebele*) leaders.

Health Facilities (Hospitals, Health Centres and Health Posts): According to the National Health Sector Strategy, all vertical programmes of the past have been integrated into the general health services. No specialized programme functions in a vertical manner. All roles including disease management, epidemic monitoring and control, IEC, LLINs, and other vector control measures will be implemented by all health facilities and health extension workers.

Woreda Level: The *Woreda* Health office is responsible for planning, monitoring and evaluating all health priorities in the *Woreda* including malaria. The main tasks relating to malaria are stratification of *Kebeles*, providing resources, and guiding and monitoring activities. In emergencies the *Woreda* health office may collaborate with the *Woreda* council and other sector offices. Other roles such as disease management, epidemic monitoring and control, IEC, LLINs, and other vector control measures will be implemented by all health facilities.

Zonal Level: The main responsibility of the zonal health office is to ensure the continuous availability of adequate essential supplies required for the different strategic approaches to malaria control. Other responsibilities include stratification of the zone into eco-epidemiological areas for better targeting of vector control interventions. The zonal health office also ensures the availability of manpower and equipment in districts, and coordinates resources of the different partners mainly during epidemic control. The zonal health office is also responsible for ensuring timely compilation, reporting, analysis of data and feedback to lower levels, as well as use of information for decision-making and quick action.

Regional Level: Regional staff support the *Woredas* in providing overall technical support, planning, resource mobilization and allocation, and monitoring and evaluation of malaria control activities.

Central Level - Federal Level: At the federal Ministry of Health level, the main responsibilities for malaria control include co-coordinating and capacity building, formulating and disseminating malaria policy, producing undated technical guidelines, strategic planning (disease management selective vector control, epidemic prevention and control), overseeing policy implementation, monitoring and evaluation of impact, and advocate for malaria as a priority disease.

Business Process Re-engineering (BPR): The BPR is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service and speed. The BPR is a country-led, multi-sectoral undertaking, implemented as part and parcel of the government's civil service reform. The Ministry of Health, in collaboration with Regional Health Bureaus and partners completed the redesigning the new system and embarked on implementation. This massive reform involves all levels from the Federal level down to the districts.

The core processes, which were the primary focus of the BPR exercise, are listed below:

1. Health Care Delivery
2. Pharmaceutical supplies
3. Public Health Emergency Management
4. Financial Mobilization and Health Insurance
5. Health and Health Related Services and Products Quality Control
6. Research and Technology Transfer
7. Health Facilities Construction and Rehabilitation
8. Policy and Planning

The major programmatic issues of malaria prevention, control and/or elimination will be dealt with by the Health Care Delivery core process, more specifically by the Health Promotion and Disease Prevention Directorate which has directorates for Rural, Urban and Pastoral Health Promotion and Disease Prevention. The other six core processes will also contribute their share to the successful malaria programme management. Malaria Prevention and Control Programme and its staff were re-organized in a manner which ensures that each and every system supports the achievement of dramatic results. In summary, successful implementation of BPR and continuous improvement are key in the ongoing fight against malaria, from scale-up to sustained control to pre-elimination.

Partnership and Coordination

In August 2008, Ethiopia signed a compact with development partners – Scaling Up For Reaching the Health MDGs through the Health Sector Development Programme, as part of the International Health Partnership. The Compact provides an overarching framework for health aid coordination in Ethiopia and complements more specific agreements relating to:

- a. The Aid Policy of the Government of Ethiopia
- b. The Code of Conduct to Promote Harmonization in the Health Sector of Ethiopia signed between Government and Development Partners in September 2005.
- c. The HSDP Harmonization Manual published by the Government in 2007.

This strategy falls in line with a core component of these agreements– the vision of one plan, one budget, and one report based on FMOH led processes– and will be included as part of the larger health sector development strategy.

Ethiopia's Roll Back Malaria Partnership

The philosophy of RBM is based on coordinated action and partnership. Therefore, establishment of effective partnerships has been and will continue to be essential to the success of the RBM programme objectives. The National Malaria Control Support Team (MCST) was established in 1998 to respond to the then on-going epidemics. After initiation of the global RBM partnership, the MCST was retained as the central level RBM task force. The MCST is composed of 72 members and meets monthly. The MCST ensures that all partners buy into the National Strategic Plan, following the philosophy of the Three Ones (One Strategic Plan, One Coordinating Mechanism and one M&E Plan). This avoids duplication of activities, and has greatly contributed to the success of the malaria control programme in Ethiopia.

Within the FMOH, the Health Promotion and Disease Prevention Directorate is the lead for MCST and Planning and Financing Directorate, Public Health Emergency Management Directorate, Pharmaceuticals Supplies Service Agency serve as members. The Planning and Financing Directorate ensures that malaria interventions are as per the sectors planning framework. Public Health Emergency Management Directorate ensures national level adequate preparedness and response to malaria epidemics. Pharmaceuticals Supplies Service Agency handles all malaria supplies issues.

Cross-Sectoral Partnerships

As this Strategic Plan seeks to move beyond sustained control and toward elimination, the involvement of other sectors will become increasingly important given the degree of collaboration required. Whereas certain aspects of malaria control (provision of LLINs, access to treatment) have traditionally been provided within the health sector, as transmission

decreases, there is a need to collaborate closely with the agricultural and water resource development sectors, as activities supported by both may result in increased malaria transmission (e.g. irrigation schemes, dam development, etc) by increasing areas bordering water.

In addition, collaboration with social protection programmes and community driven development schemes will grow increasingly importance as communities are engaged actively to assist with surveillance. Finally, the Ministry of Finance's involvement may also increase given the need for increased domestic resources alongside increases in ODA. The predictability of recurrent domestic financing will be an important platform to attract additional international assistance, making the active engagement of the MOF throughout strategic plan implementation will be emphasized.

Specific activities will include:

- Ministry of Agriculture and Rural Development: to mobilize extension workers involved in community based agricultural activities who in turn can mobilize communities for malaria prevention and control.
- Ministry of Finance and Economic Development: tax reduction on LLINs, to promote advocacy opportunities to mobilize increased malaria programme resources and to ensure programme costs are in line with MOF, IMF, etc. policies
- Ministry of Water Resources and Development: incorporation of malaria preventive measures in water development projects.
- Meteorological Service Agency: epidemic forecasting and early warning.
- Ministry of Education: incorporation of malaria prevention and control in school curricula and malariology courses in the curriculum of pre-service health training institutes; case management of malaria cases in teaching hospitals
- Ministry of Information: IEC.
- Research Institutions and Universities (including EHNRI): operational research
- Investment Office, Environmental Protection: incorporation of malaria preventive measures in construction activities and environmental development projects.
- Disaster Prevention and Preparedness: information on natural disasters, mass population movement.
- DACA (Drug Administration and Control Agency): involved in the registration and approval of anti-malarial supplies. Within the new BPR structure (see below), DACA's regulatory mandate has increased to health professionals and health facilities.

Public-Private partnerships

Private Sector: Partnership with the private sector will be further promoted. The private sector can particularly be involved in disease management, distribution of LLINs, and other

operational activities. Close working relationships will be created with the private sector to involve them in the implementation and support of malaria control programmes.

International NGOs: The MCST includes a number of international NGOs who support the Government in coordination and implementation of activities to support malaria control efforts.

Local NGOs and religious groups: A major focus of the National Strategy is to achieve sustained control towards elimination through community mass movement mobilization. Local NGOs and religious groups will be crucial partners with the HEWs.

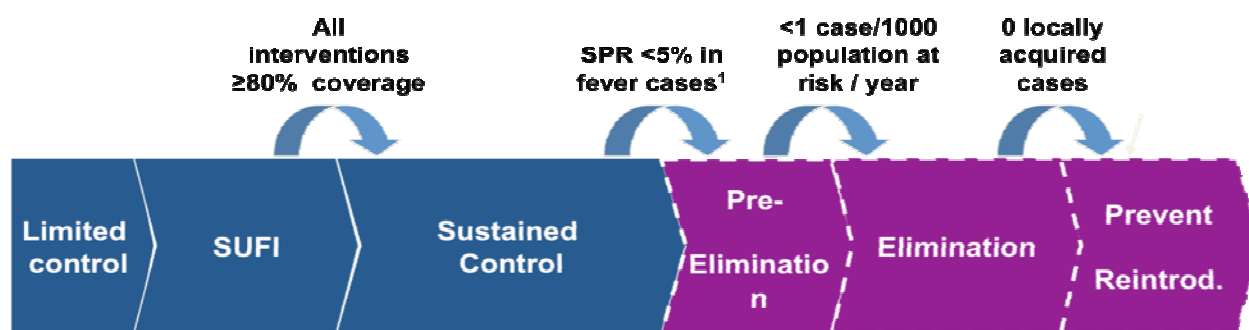
The Strategic Plan 2011 - 2015

Rationale

Malaria Control

The Roll Back Malaria Global Malaria Action Plan defines malaria control as a continuum consisting of two main stages with different, although complementary, objectives:

- Scaling-Up for Impact (SUFI) with a goal to rapidly reach universal coverage for all populations at risk with locally appropriate malaria control interventions, supported by strengthened health systems.
- Sustained Control with a goal to maintain universal coverage with interventions by continued strengthening of health systems until universal coverage



Ethiopia was one of the first countries to embrace the SUFI concept for malaria control. Since 2005, over 20 million long-lasting insecticidal nets have been delivered to around 10 million homes in malarious areas of Ethiopia, resulting in the highest reported household ownership of ITNs in Africa. In addition, the indoor residual spraying programme has been scaled-up. Treatment with Artemisinin-based combination therapy has been rolled out nationwide through health facilities including through the Health Extension Worker network, alongside improved diagnosis with Rapid Diagnostic Tests. The Ethiopian government and partners are working to improve community awareness through community based communication and social mobilisation. As a result of the huge scale-up in malaria prevention and treatment that has occurred since 2005, health facilities are reporting sustained reductions in both cases and malaria-related deaths, even during the height of the transmission season. These scale up efforts have spill over effects towards goals of broadly reducing both maternal and child mortality.

The way forward

Sufficient resources have been secured, through the Global Fund, World Bank, US President's Malaria Initiative and others to support universal coverage of key malaria interventions by the end of 2010. Thus, Ethiopia will move from SUFI to sustained control, as key steps in the process towards malaria elimination by 2020. In the coming years, Ethiopia will need to build on and sustain the tremendous progress that has already been made, ensure that the quality

of the services delivered is high, and will need to further strengthen some key areas such as indoor residual spraying, diagnosis, rational drug use and surveillance, including epidemic surveillance and response.

These steps will form part of the roadmap in preparation for pre-elimination by 2015, geographical elimination, especially in areas of historically low transmission.

The 2011-2015 NSP will focus on sustained control and moving towards malaria elimination through an integrated community health approach, especially in areas of unstable malaria transmission, building on SUFI achieved by the 2005-2010 strategic plan. The 2011-2015 NSP will achieve these ambitious goals by integrating specific interventions (components 2 and 3) within the overall health system and relying on strong community involvement through the HEP (see component 1). Surveillance is a key component of the overall strategy to move towards elimination (see component 4). Supporting strategies, such as M&E, HR development and Operational Research will contribute to achieving this Plan's objectives.

Elimination

WHO recommends indicative epidemiological milestones for determining when a low- or medium-transmission country has an incidence low enough to begin the rigorous surveillance required during elimination. When the slide positivity rate (SPR) of all febrile patients with suspected malaria is less than 5% or the incidence is less than 5 per 1000 people at risk, the country, or district in some cases, could consider transitioning into "pre-elimination" if other factors are in place as well. The ability of a country to measure and know definitively its incidence rate is in itself an indication of the country's readiness to enter pre-elimination. The new RBM and WHO stages for malaria control and elimination can be matched to the terminology used during the previous global malaria eradication programme initiated in the 1950s. SUFI and sustained control are similar to the attack phase, when malaria infection prevalence is reduced to less than 5 per 1,000 population per year in at risk areas. Pre-elimination and elimination are equivalent to the consolidation phase, when interruption of transmission is achieved. In the final maintenance phase, prevention of introduction and local transmission are maintained for 3 consecutive years, at which time a country can be certified by WHO as malaria free.

Cross border collaboration

Malaria control programs are being scaled up throughout the Horn of Africa region. Sudan, Kenya and Eritrea are all expected to reach 100% LIIN/IRS coverage by the end of 2010, and are all rolling out ACTs through health facilities and increasingly at community level through community health workers. Whilst malaria control is scaling up in Somalia, it is expected that due to the complex programming environment, universal coverage of malaria interventions is unlikely to be achieved in the near future, however malaria transmission is generally low along the Somalia-Ethiopia border. Thus, with reference to Ethiopia's borders, three of the four neighbouring countries are on track to achieve universal coverage by the end of 2010,

and significantly reduce malaria burden. With Ethiopia achieving full coverage by the end of 2010, it is paramount that cross border collaboration is strengthened to further reduce malaria on a regional basis. This will be even more important as Ethiopia moves towards elimination by 2020, as synchronization of malaria control across borders is required to reduce and eventually stop re-introduction of parasites into malaria free areas.

It is estimated that more than 2 million people cross Ethiopia's borders annually and cross-border malaria control aims at institutionalization of collaborative mechanisms among border districts to reduce and halt transmission. This includes provision and synchronization of malaria reduction interventions and establishment of information exchange mechanisms, especially at local level.

Coordination of cross border malaria control and elimination will require collaborative work between leaders and health staff from neighboring countries. Regular biannual meetings among the representative of neighbouring countries FMOH and RHBs will help improve coordination and information exchange for better performance. This collaborative work will develop coherent technical policies and joint country plans relating to cross border malaria interventions that will guide the implementation of malaria control activities and synchronize control strategies in these areas. This will also include cross-border surveillance and detection of malaria infection and effective treatment of all positively diagnosed cross-border travelers.

Purpose

The purpose of this NSP is to elaborate the malaria prevention and control country directions and implementation strategies so that all efforts by RBM partners are harmonized and tuned towards sustaining universal coverage and putting Ethiopia on track to malaria elimination through an integrated health systems approach. This strategic plan is intended to serve as a guide for the development of plans of action at various levels in the context of the HSDP IV that aims to achieve full access and total coverage of malaria prevention and control intervention services to the population at risk.

The NSP also provides indicative figures on the resource needs for the implementation of the planned activities in a bid to emphasize on the need to hasten resource mobilization efforts. The plan also emphasizes on the need to strengthen monitoring and evaluation (M&E) activities to complement the scale up of malaria interventions in order to measure the progress, effectiveness and impact of implemented activities.

The main purposes of this NSP at various levels of the system are:

For FMOH: To identify areas those require policy decisions and guideline revision and development, as well as coordinating M&E activities, resource mobilization and capacity building.

For Regional States: To guide development of locally appropriate plans and implementation arrangements and detailed work plan for zonal, district and community levels.

RBM Partners²¹: A basis for identifying and developing strategic roles to fill gaps in technical and resource inputs critical for the attainment of the goal

For Academic and Research Institutions: To identify problems and to design and implement research activities that fit the local conditions (representativeness & standard of protocol) so that the findings will have the quality to be used to influence policy.

For the Private Sector: To explore feasibility and investment needs for the local production of malaria commodities (drugs, RDTs, LLINs, etc) through joint venture or other means of commercial arrangement.

For NGOs and affected communities: To empower communities, local NGOs, HEWs, community leadership and affected populations to actively seek malaria elimination.

Scope

This document includes the vision, mission, mandate, values, situation analysis, goals and strategic objectives in relation to all malaria prevention, control and treatment activities in Ethiopia for the period 2011-2015. Further the document indicates the monitoring, evaluation and indicators of the programme, budget implications and schedule for the implementation of the strategic plan.

The strategic plan provides a detailed account on the status and direction of the major malaria prevention and control strategies that include early diagnosis and treatment, selective vector control and malaria epidemic prevention and control, surveillance, as well as supporting strategies that include IEC and social mobilization, human resources development, HMIS, M&E and operational research.

For each of the major and supporting strategies which are described separately, general objectives, operational targets and opportunities and challenges including the budget need are indicated.

²¹ Includes donors, NGOs, civil society and religious groups

Vision

To see malaria free Ethiopia

Mission

Through an integrated health systems approach, with a particular focus on the Health Extension Programme, the Malaria Prevention and Control program will expand and maintain high quality malaria prevention and control interventions with special emphasis on community empowerment and mobilization.

Goals

- By 2015, achieve malaria elimination within specific geographical areas with historically low malaria transmission
- By 2015, achieve near zero malaria death in the remaining malarious areas of the country

Objectives

The objective of the 2011-2015 National Strategic Plan is to consolidate the achievements of the 2006-2010 National Strategic Plan, and sustain its impacts. This overall objective will be attained through the following specific objectives:

1. 100% of suspected malaria cases are diagnosed using RDTs and/or microscopy within 24 hours of fever onset
2. 100% of positive malaria diagnosis are treated according to national guidelines
3. 100% of households in malarious areas own one LLIN per sleeping space
4. At least 80% of people at risk of malaria use LLINs
5. IRS coverage is increased and maintained to 90% of households in IRS-targeted areas²².
6. 100% of health posts in malarious *Kebeles* provide the full malaria prevention and treatment package, including outreach services.
7. To achieve a high quality, broadly-based malaria infection detection, investigation and response surveillance system in 100% elimination targeted malarious districts of the country.

²² IRS-targeted areas are defined through geographical reconnaissance and risk-mapping.

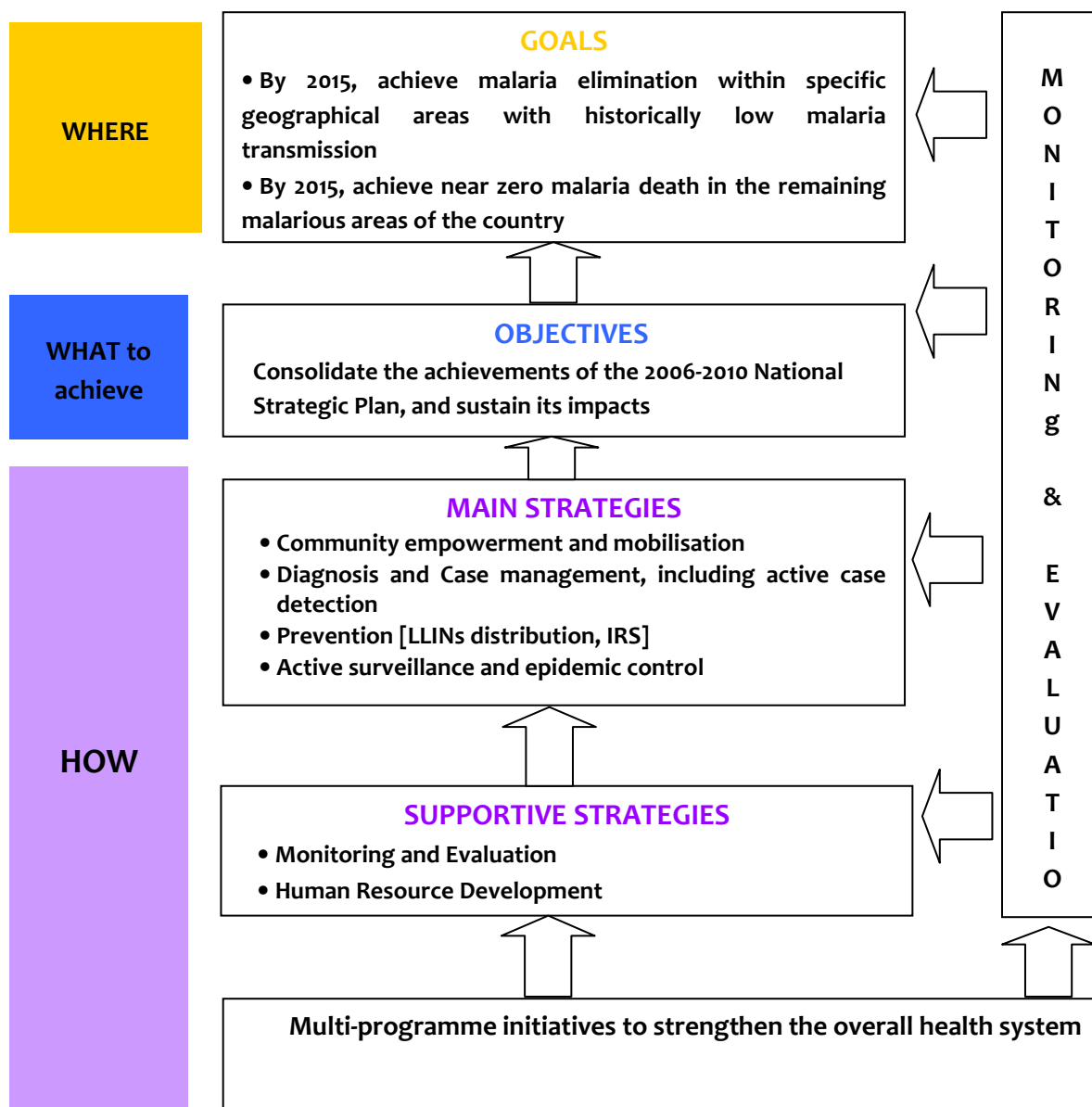


Fig 5. Framework of the strategic plan

Component 1: Community empowerment and mobilization**Background/Situational analysis**

Community empowerment and mobilization are central to malaria prevention and control. It is arguably even more important in the next phase of Ethiopia's malaria control effort as the country moves from high-level control to zero transmission and elimination. Success in achieving the health related MDGs requires active and meaningful participation and ownership by communities and strong partnerships between households and health workers. The Health Extension Programme educates, mobilizes and involves the community in all aspects and stages of malaria control and leads to increased ownership of the programme. It is recognized that it is only at community level that malaria elimination will be achieved.

The HEP, with a focus on the use of innovative communication, such as community dialogue and the creation of model households, will be used at the community level to widen participation, strengthen community ownership, create awareness and increase the uptake and utilization of malaria control services. This will be achieved by strengthening the malaria component within integrated health social communication established within the health extension program, primarily managed by HEP supervisors, HEWs and their community volunteers.

Communication is a key component of community empowerment and mobilization. IEC/BCC provides information and skills to populations at risk of malaria so that they can make informed decisions and participate in malaria prevention, treatment, and control. In particular, IEC/BCC raises community awareness about the signs and symptoms of malaria, encourages early treatment-seeking behaviour and treatment compliance and creates demand for and increases the utilization of malaria services including ITNs. The overall goal of the IEC/BCC programme is to increase community understanding, mobilize resources and guarantee the sustainable results. This is done through a variety of media and channels including mass media (especially radio), interpersonal communication (especially from health extension workers), participatory communication (including community dialogue) and social mobilization (particularly during distribution campaigns and emergencies). Significant challenges remain in improving both the "supply" (health services and products/interventions) and "demand" (communication) sides to achieve effective implementation of malaria prevention and control programme.

Recent studies in Ethiopia have reported that knowledge about malaria and recognition of the sign and symptoms has significantly increased between 2005 and 2007: according to the 2007 MIS, 50% of care givers recognized fever as a symptom of malaria with 74.6% of them reporting having heard of malaria. In malarious areas, in households with at least one ITN, the rates of ITN use among those most vulnerable (children under five years of age and pregnant women) are quite high (60% and 66%, respectively). There has been only a slight increase in malaria care-seeking behavior, but 43% of children under age five years who took an anti-

malarial in the two weeks preceding the survey had been given the recommended ACT. Whilst these results are encouraging, there remains a need to further strengthen community malaria awareness and reduce misconceptions, by scaling-up BCC efforts in all malarious areas of the country.

Policy/Guidelines

Since 2005 the Health Extension Programme has prioritized community ownership and empowerment. This is supported through deployment of two community selected HEWs in each of the newly constructed health posts in nearly all of the estimated 15,000 *Kebeles*. The programme emphasizes an integrated approach, including health promotion and preventive and referral health services through HEWs, with the support of community volunteers and model family households. Thus, communities are empowered through community engagement, ownership and social mobilization to support a mass movement towards universal malaria prevention and control, to eventually eliminate the disease.

The national health communication strategy, launched in 2004, provides a national communications strategy for all areas of health. However, there is limited malaria-specific communication within this strategy. Most IEC/BCC activities related to malaria have been sub-contracted to NGOs and to the civil society in Ethiopia.

Objective

- 100% of people living in malarious areas recognize the importance of using an LLIN, having their house sprayed, seeking treatment within 24 hours of fever onset for the prevention of malaria.
- 100% of health posts in malarious *Kebeles* provide the full health extension package including outreach services, social communication and mobilization and empower model family households

Targets

- To promote political and *community* support for malaria prevention and control services through educating and influencing planners, policy makers, managers and potential collaborators.
- To improve advocacy and resource mobilization skills for integrated multi-sectoral malaria control activities at national, regional, zonal and *Woreda* levels.
- To create an enabling ground for partners to synergize their IEC/BCC activities and as a result, avoid duplication of efforts.

- To develop the capacity for producing appropriate IEC materials at various levels.
- To improve communication skills among service providers and front-line educators.
- To improve skills of mass media personnel in communication and information.

Key Outcome Indicators

- Proportion of women who recognize ITNs and/or IRS as a malaria-prevention method
- Proportion of women who recognize fever as a symptom of malaria
- Proportion of women reporting exposure to IEC/BCC activities through the HEP
- Proportion of community members actively participating in malaria prevention and control activities?

Activities

Strengthen Community Empowerment and Mobilization

The HEP supports community ownership and empowers communities to fully participate in the malaria control activities and improve the utilization of malaria interventions. Community members actively select HEWs and community volunteers, and participate in LLIN distribution and IRS programmes. Community members are involved in social mobilization and communication activities.

The HEP outreach interventions will include innovative community-based activities that will bring people together through HEWs and community volunteers to explore and address underlying causes of poor LLIN and service utilization. The communication methodology - community conversation - will be introduced as an innovative activity for malaria IEC/BCC. Community conversation (CC) was first introduced in Ethiopia in 2003 to increase awareness for HIV/AIDS prevention and control. The approach has been so effective that it is now being utilized by the FMOH to maximize the impact of the HEP at community level. A national CC manual for malaria will be developed and trainers drawn from all regions will be trained. These trainers will further train two CC facilitators each from highly malarious *Woredas* of the country. HEWs will identify 'model households' (families with a willingness to change their behaviours), and through community conversation, members of these model households will become Voluntary CHWs (VCHWs), and will then participate in community communication activities supervised by the HEW, as well as display to the community the benefits of fully using malaria prevention and control interventions. Through community conversations, people will be empowered to consider all the ramifications of a given situation, thereby enabling people to reflect on and assess the effect of their behaviour and values on their lives. HEWs and VCHWs will use existing entry points such as school health clubs, faith based organizations, civil society organizations, to expand community-based communication activities. Other "traditional" communication activities, such as using mobile video units and folk media (theatre, role-playing) will be used.

Strengthen the capacity of Health Extension Workers in communication at health post level and in community outreach

The primary channel for the delivery of malaria IEC/BCC is through the HEP, as part of the integrated health social communication package provided by the HEWs and community volunteers. A comprehensive IEC/BCC training manual has been developed and a three-day training for HEWs will be rolled out. HEWs will be provided with malaria communication materials and job aides, which include flip charts and treatment algorithms for ACTs and RDTs.

Develop a national, malaria-specific communication strategy

The national health communication strategy was launched in 2004 but is not malaria-specific. As mentioned earlier, IEC/BCC activities are paramount to the success of the interventions described in this Strategic Plan. The malaria-specific communication strategy will ensure coordination of all partner activities and address the dynamic issues in malaria prevention and control in Ethiopia. The FMOH, along with Health Extension and Education Centre (HEEC) will take a lead in this exercise, with key communication partners including civil society, FBOs, NGOs and the private sector.

Increase the Use of Supportive Mass media

All mass media outputs will be fully co-coordinated to create synergy between different communication channels. Posters and brochures promoting use of LLINs and IRS, adherence to treatment and the importance of early treatment seeking behaviour will be produced and disseminated to different segments of the target audiences. All these materials will be developed, pre-tested and finalized by skilled malaria communication specialists in the country. A major emphasis will be placed on the use of radio to disseminate information, in recognition of the fact that radio is the *only* medium with a wide scale-reach in Ethiopia, especially amongst underprivileged groups. The MIS showed that nation-wide, 34% of households own a radio. Radio spots, Public Service Announcements (PSAs) and longer format radio programming, such as dramas and radio magazines, will be broadcast through national and regional radio, as well as other channels. All messages will be pre-tested at the community level. In addition, documentary films will be produced in five languages and will be aired on Ethiopian TV (ETV). Documentary films are used for community mobilization through mobile video units that travel across the country. This has proven effective in disseminating key messages. Trained facilitators accompany mobile video units, are proficient in local languages and facilitate a participatory discussion and Q/A sessions during the peak malaria transmission seasons in the country.

IEC/BCC Materials Production and Distribution

- IEC/BCC materials targeting different segments of the population will be developed and disseminated in five major languages. The FMOH/HEEC will develop mass media malaria information campaigns (using print, electronic and folk media) to create awareness about malaria prevention and control. RHBs will produce IEC materials on malaria in local languages

and disseminate them through local communication channels. In addition, targeted and coordinated media coverage will be intensified during epidemics to ensure mass action toward epidemic control. The capacity of the FMOH, HEEC and RHBs will be strengthened to produce effective IEC/BCC materials through communication training, provision of training guidelines and increased financing to support the production of materials.

- The FMOH will coordinate with major partners and work through regional, *Woreda* and *Kebede* structures to ensure consistency of messages and to strengthen linkages between all stakeholders: health centres, HEWs, VCHWs, local organizations, schools, and individual families to ensure comprehensive implementation of malaria prevention and control interventions. The content and format of the materials will be agreed upon by the MCST and eventually clearly defined in the malaria-specific communications strategy.

Component 2: Diagnosis and Case Management

Background/situation analysis

Diagnosis and case management of malaria are essential components of the health extension package in Ethiopia.

Diagnosis

Microscopic diagnosis of malaria is the gold standard method for parasitological diagnosis and is available in all health centers, hospitals, private clinics and laboratories. The availability of microscopy services are thought to enable diagnosis of 30% of all fever cases. Rapid diagnostic tests are used to diagnose malaria at health post level and below, and are expected to cover the remaining 70% of fever cases. Even though the majority of malaria diagnoses in Ethiopia are still based on clinical evaluations, since 2007 there has been a major shift from clinical diagnosis to confirmatory diagnosis following the wide-scale use of RDTs in peripheral health facilities. To improve the quality of malaria diagnosis and treatment at peripheral health facilities (health posts) pan-specific RDTs are now being introduced. HEWs will be trained on the use of multi-species RDTs in the integrated refresher training (IRT). A Laboratory-Based Quality Control Testing of Malaria RDTs in Ethiopia has recently been introduced and will ensure the procurement and use of quality assured RDTs. It will be essential as we move to sustained coverage and towards elimination of malaria that all malaria cases are parasitologically confirmed before treatment.

Case Management

Following a nationwide study of therapeutic efficacy of Sulfadoxine-Pyrimethamine (SP) for the treatment of uncomplicated *P. falciparum* malaria that showed high mean treatment failures rates, a treatment policy change occurred in 2004. Following this policy change, RDTs were introduced to complement clinical diagnosis at community and health level and SP was replaced by ACTs (Artemether-Lumefantrine [Coartem®]) as the first line treatment for uncomplicated *P. falciparum* malaria. ACTs have been rolled out countrywide since their introduction in 2004.

Access to treatment has significantly increased with the introduction and rapid scale up of the HEP. According to the health related indicators (2008-9), 90% of the population now have access to health care services.

The establishment of an agency entirely responsible for drugs and supplies procurement and distribution (i.e. PSA) is an outcome of the sector wide reform which will bring about dramatic improvement in logistic management. Anti-malarials and diagnostic supplies will be procured at the national level through PSA and distributed directly to health facilities.

Policy/ Guidelines

The federal ministry of health is mandated to issue policies and guidelines and to follow-up on their implementation. The following guidelines are available and are in use by the Malaria Programme and partners in the country.

Diagnosis and Treatment Guidelines for health workers in Ethiopia 2004

They include the following key policy and strategies:

Diagnosis

- All diagnosis of malaria should be based on parasitological diagnosis with RDTs or microscopy.
- Rapid diagnostic tests (RDTs) are being used in the health posts at community level, covering an estimated 70% of fever cases.
- Microscopy remains the gold standard for diagnosis of malaria and is used in health centres and hospitals, covering around 30% of all fever cases

Case Management

- The Artemisinin-based Combination Therapy, Artemeter-Lumefantrine or CoArtem®, is the first line drug for treatment of *P. falciparum* uncomplicated malaria
- Quinine is the first line drug for treatment of severe malaria and artesunate suppository will be used as a pre-referral treatment of severe cases
- Quinine remains the treatment of choice for pregnant mothers during the first trimester of pregnancy, children under five kilograms body weight, and for treatment failures
- Chloroquine remains the first line drug for treatment of *P. vivax* malaria.
- Sentinel sites carry out drug efficacy studies to monitor the development of resistance.
- The Drug Administration and Control Authority (DACA) is mandated as a regulatory body for quality control and registration of drugs and pharmacovigilance of new drugs. The agency works closely with the FMOH.

Diagnosis and case management of malaria at health extension post level with RDTs and ACTs is free of charge. However, treatment at health Centres and hospitals of severe malaria is presently not free, except during epidemics when all treatment is free of charge to end users.

Objectives

1. 100% of suspected malaria cases are diagnosed using RDTs and or microscopy within 24 hours of fever onset
2. 100% of positive malaria cases are treated according to national guidelines
3. 100% of severe malaria cases are managed according to national guidelines

Targets

- Provide RDTs and/or microscopy service to all health facilities in malaria risk areas to sustain universal coverage of parasitological diagnosis.
- Provide ACTs and other anti-malarial medicines to all health facilities in malarious areas to sustain universal coverage of treatment.
- Provide universal access to prompt and effective anti-malarial treatment through confirmed diagnosis within 24 hours from onset of fever by the end of the year 2015.
- Provide TOT (malaria diagnosis and treatment as part of IRT) to 100% of HEWs supervisors in malaria endemic areas.
- Train 100% of HEWs (malaria diagnosis and treatment as part of IRT) assigned in malaria endemic areas.

Key Outcome Indicators

- Proportion of all age groups with fever in the last 2 weeks who received diagnosis within 24 hours from fever onset
- Proportion of all age groups with a positive malaria diagnosis, who received treatment (per guidelines) within 24 hours from fever onset
- Proportion of severe malaria cases presenting at health facility receiving appropriate case management as per guidelines

Activities

Improve capacity of peripheral health workers in the diagnosis and case management of malaria at health post level

HEWs and their supervisors will be trained through integrated refresher training in the use of multispecies RDTs, correct prescribing practices (to ensure that clinical cases with a negative RDT result will not be treated) and correct treatment of positive RDTs with ACTs. Updated treatment guidelines, treatment algorithms and job aides will be provided to reinforce training. HEWs will be trained in the recognition of the signs and symptoms of severe malaria and referral criteria. Active malaria case detection and treatment will be further expanded. In the medium term, as the number of malaria cases decrease as a result of successful malaria control, options for treatment of fever resulting from other causes at health post level has already been considered, particularly for the treatment of pneumonia. Accordingly an integrated community case management (ICCM) protocol for managing febrile cases at health post level was developed. This will likely increase health worker and patient compliance with the results of negative malaria tests if alternative treatments can be offered.

Mobilizing and capacitating communities will be a major activity in malaria diagnosis and case management because communities' involvement will be of critical importance to find, identify and report all cases of fever to health workers or to health posts.

Improve capacity of health workers in the management of severe malaria at health centre level

Health workers will be trained in the management of severe malaria, prioritizing facilities with higher case fatality rates. Treatment guidelines will also be provided.

Ensure availability of essential commodities for the diagnosis and treatment of malaria

RDTs, laboratory supplies for microscopy, ACTs and other anti-malarial medicines will be procured at the national level through PSA and distributed to RHBs/ district health offices. Districts will ensure RDTs and ACTs reach peripheral health facilities, and that laboratory supplies, quinine and other essential commodities for the treatment of severe malaria reach health centres and hospitals. .

Increasing diagnosis capacity and strengthening diagnosis quality at health centre and hospital levels

Microscopes will be procured for newly constructed and upgraded health centres and distributed through the existing system and channels to the RHBs and then district health offices. These districts then distribute to eligible health facilities. External quality assurance (EQA) system will be instituted in all health centers and hospitals and training will be given to laboratorians on EQA principles. Furthermore, refresher training will be provided to all microscopists annually through integrated laboratory training.

Improve health care seeking behaviour through intensive IEC/BCC

Health care seeking behaviour including compliance with treatment will be improved through intensive IEC/BCC (see cross-cutting component A).

Strengthening of support supervision

HEW performance will be improved through a system of support supervision support, monitoring, peer support and mentoring. A key focus will be on supporting health centre-level HEW supervisors. Specific activities include the strengthening the training of the newly appointed HEW supervisors through workshops and review meetings; and procuring motorcycles for HEW supervisors to ensure continuous and timely HEW supervision and strengthening of the overall health care service delivery.

Component 3: Prevention

The two main major vector control activities implemented in the country are IRS and LLINs. Other vector-control activities include environmental management and larviciding, in localized areas where operational research has shown that they work. Ethiopia will maintain universal coverage of LLINs targeting all malarious localities (lying below the altitude of 2000m). IRS is targeted to reach 90% of households in epidemic-prone areas.

As a signatory to the implementation of the Stockholm Convention, Ethiopia shares concern for the environment and gives due respect for its implementation. Accordingly, the FMOH seeks always to balance use of the most environmental friendly insecticides with the need for effective malaria control.

Component 3.1: Long lasting insecticidal nets

Background / Situation analysis

Ethiopia has acquired considerable experience during the first Scaling Up For Impact (SUFI) phase of the national malaria reduction programme. The more than 20 million LLINs that have been distributed to 10 million families appear to have contributed to the reduction of malaria, and the strategies and activities required to implement this have now been tried and tested. LLINs have been distributed through a variety of channels, depending on local circumstances. The majority have been distributed through stand-alone campaigns, and others through campaigns integrated with EPI and the Enhanced Outreach Strategy, or from static health facilities. In addition, smaller numbers of LLINs have been distributed through social marketing and the commercial sector in urban areas. Approximately 500,000 LLINs were distributed as part of the emergency response to areas affected by drought, floods, and in areas with very weak health systems.

The 2007 MIS showed significant improvements in LLIN ownership in malaria risk areas from 3.5% in 2005 (DHS 2005) to 65.6% in 2007 (MIS, 2007). Ethiopia now also reports the highest LLIN household ownership and second highest LLIN utilization by under-five children in all Sub-Saharan Africa²³. The proportion of children under-five who used an LLIN the previous night below 2,000m increased from 1.5% in 2005 (DHS) to 41.5% in 2008. In addition, 43% of pregnant women were reported to sleep under an LLIN the previous night, also the highest rate in Africa²⁰. High coverage and utilization rates need to be maintained to support the plan to reach elimination by 2020.

The 2007 MIS indicates that the average number of sleeping spaces per household is 1.8 thus the average of 2-LLINs-per-HH covers most sleeping spaces. Although an average of 2 nets per household is used for logistic/calculation purpose, the number of LLINs that a household can receive is increased where household size is higher, so that, for example, families of 6 persons will receive 3 nets, those with 8 persons 4.

Policy/Guidelines

The FMOH has an LLIN strategic plan (2009-2013) which includes the following policies relating to LLINs:

- ***All malaria affected households have the right to protect themselves from malaria infection by using LLINs***

23 Malaria and Children: Progress in Intervention Coverage: Updated Summary for World Malaria Day 2009 UNICEF and Roll Back Malaria Partnership (RBM) joint report, 2009

This policy is in line with the HSDP IV which proclaims that all citizens have the right to health care. All people at risk of malaria are eligible for LLINs. It is also essential to maximize use of LLINs for sustained malaria prevention, as Ethiopia moves to elimination by 2020.

- ***LLIN use will continue in Kebeles that achieve elimination, to reduce the risk of reintroduction of human infections.***
- ***Multiple LLIN distribution mechanisms will be used to ensure all malaria affected families can protect themselves from malaria infection***

Distribution mechanisms include:

- Replacement of worn out/ old ineffective LLINs with new free LLINs through the HEP and through keep-up strategy and campaigns (catch-up)
- Free distribution of LLINs to all rural malaria affected households that are still in need of LLINs
- Free distribution of LLINs during emergencies
- Subsidized nets for other households, especially in urban areas through market priming /social marketing
- Unassisted commercial marketing
- ***Increase ownership and utilization of LLINs through demand creation, and improved knowledge (see IEC/BCC section).***
Demand creation is a fundamental component for going to scale with LLINs. The government, in collaboration with partners (including the private sector), will support generic promotion of LLINs. A variety of approaches can be used, including:
 - Mass media, including national, local and community radio, newspapers, leaflets, posters and television
 - Interpersonal communication, social mobilization, and drama
 - Participatory communication at community level, making use of the social communication package through HEP, model families and other community volunteers.
 - Participatory communication at community level, making use of strategies such as the HEP, model families and other community volunteers.
 - Faith Based Organizations, civil society and other traditional channels of communication, including schools, women's groups and community gatherings.
 - Commercial advertising and marketing techniques.
- ***Support creation of a favorable economic, fiscal and regulatory environment to encourage the expansion and utilization of LLINs***
 - The government will support the development of a favorable LLINs distribution system through effective public-private partnership including local production of LLINs and insecticides,

- Registration of all products that meet WHO standards to encourage competition and wider consumer choice,
- Encourage provision and use of LLINs in collective residential/recreational sites (resort areas, hotels, schools, farming & other development projects).
- ***All nets and insecticides supplied in Ethiopia must meet minimum standards, as determined by WHO.***
 - All nets and insecticides must meet minimum standards, as determined by WHO.
 - WHOPES-approved LLINs are the most appropriate for Ethiopia

Objectives

- 100% of households in malarious areas own one LLIN per sleeping space
- At least 80% of people at risk of malaria uses LLINs

Targets

- Provide sufficient LLINs to reach and maintain 100% ownership of LLINs in malarious areas (with one LLIN per sleeping space).
- Achieve and maintain levels of use above 80% by all age and biological groups up to 2015.
- Encourage local production of at least 3 million LLINs per year.
- Create effective partnerships with the public sector, NGOs, civil society and the private sector.

Key Outcome Indicators

- Percent of households in malarious areas owning at least one LLIN
- Percent of people (all ages) that slept under an LLIN the night preceding the survey
- Percent of children under 5 that slept under an LLIN the night preceding the survey
- Percent of pregnant women that slept under an LLIN the night preceding the survey

Activities

The process of ensuring that all people at risk of malaria protect themselves by using LLINs involves a series of activities from procurement and distribution to communication to increase utilization for maximum impact. Ethiopia has acquired considerable experience since 2005 in procuring, storing and distributing over 20 million LLINs to malaria affected communities throughout the country. A number of different strategies were used to achieve this, with the choice of distribution channel depending on local circumstances and experiences.

Geographical targeting of LLINs

National policy is to provide all malaria affected households with an average of 2 LLINs per household. All *Kebeles* identified as malaria affected, including epidemic affected *Kebeles* will be targeted. The majority of these are below 2,000 meters. *Woreda* health staff, together with personnel from health centres and health posts compile lists of malaria affected *Kebeles*. To date approximately 489 *Woredas* have around 10,000 malaria affected *Kebeles* (HEP database and reports from *Woredas*).

Woreda-level micro-planning

Woreda-level micro-planning will be conducted to develop distribution, transport, human resource plans and budgets to deliver LLINs to households. Micro-planning will also be used to further refine targeting.

Procurement, customs clearance, storage and distribution of LLINs

The Pharmaceutical Supply Fund Authority (PFSA) will coordinate and manage the procurement of LLINs. Procurement can be outsourced to UN agencies. LLINs will be shipped to Djibouti, and for large consignments transported directly to regional capitals in Ethiopia, as per plans developed by the FMOH and RHBs. Customs clearance is organized by the FMOH. LLINs are stored in RHB warehouses and then distributed to *Woredas* warehouses. Finally LLINs are transported to health posts as per micro-plans developed by *Woredas* and RHBs, for distribution by HEWs to households.

IEC/BCC to increase utilization rates of LLINs

The primary delivery point for malaria IEC/BCC activities is through the Health Extension Programme, as part of the integrated health social communication package provided by the HEWs and their volunteers (see IEC/BCC section).

Monitoring and recording of LLIN distributions

Monitoring of LLINs distribution through ITN registers and the HEP database will be strengthened through further training and establishment of HEP at regional and *Woreda* offices (see M&E section).

Distribution strategies/channels

LLINs can be distributed through more than one method tailored to the situation in each kebele. Two major methods are outlined, although health staff at all levels can make final decisions, based on local circumstances

Replacing Old LLINs (Keep-up)

The LLIN replacement scheme will be the main way to ensure a sustainable continuous supply of LLINs at *Kebele* level. Systems will be developed, primarily through the HEP, to ensure that all households in elimination targeted *woredas* have access to and use LLINs at all times. For the overall management of the LLIN replacement scheme, HEWs will consolidate their *Kebele* ITN registers, which they use to assist with identifying families needing new LLINs. The

records will be an important monitoring tool for management, and feed into ITN databases at *Woreda*, regional and eventually in the national HEP database.

Mass distributions through campaigns (Catch-up)

Some communities in Ethiopia do not yet have a HEP strong enough to operationally implement the replacement scheme. In these areas, and also during emergency responses, mass distributions are the most appropriate means of maximizing coverage.

The majority of the 34.7 million LLINs distributed since 2005 have been delivered through campaigns, and as a result there is substantial expertise at all levels of the health system and among NGOs to continue with this strategy. LLIN distribution through campaigns can rapidly provide immediate large scale protection to entire communities, with at least 2 LLINs per household. Once this is achieved, the LLIN replacement scheme will begin to ensure long term access to LLINs by all households.

LLINs can be distributed through the following types of campaigns:

- *Stand-alone*: LLINs are distributed to all households in need in selected *Kebeles*. Social mobilization is conducted to invite people to distribution points.
- *Integrated distributions with EPI and EOS campaigns*: LLINs are delivered through the same systems and structures as for the immunization, vitamin A and MalTra (Azithromycin distribution campaigns), and use the same planning, implementation and monitoring systems.
- *Emergencies*: LLINs are delivered rapidly in emergencies such as epidemics, floods, and in areas of conflict. The delivery method is based on the best mechanisms available including distribution by emergency health and nutrition mobile teams, and use of traditional structures, especially where health systems are weak.

Commercial LLINs

The commercial sector will continue selling LLINs and ITNs at commercial or subsidized rates, especially in urban communities. During the previous 5-year strategic plan (2006-2010), more than 400,000 ITNs are estimated to have been distributed through PSI's social marketing, the NETMARK voucher scheme and private sector. The Government's role in private sector distribution will be to create an enabling environment necessary for long-term sustenance of the commercial sector in LLINs business.

Component 3.2 Indoor Residual Spraying (IRS)

Background/Situational analysis

Currently, IRS, as a main component of selective vector control, is targeted to cover epidemic-prone areas, development projects, and malaria-affected communities with low access to the health care system. In the context of SUFI, IRS of households using DDT has been scaled up dramatically, from 700 tons in 2005 to 1700 tons in 2008. In 2008, 3.79 million unit structures were sprayed, protecting 11.9 million people. However, due to a relatively high level of resistance of the local vector for DDT in most areas of the country, deltamethrin has been introduced as an interim choice of insecticide for use in Ethiopia. Accordingly, most epidemic prone areas were sprayed by deltamethrin and few malarious areas with DDT. The coverage estimated to have reached 55% of the target areas by 2009. Studies underway on various classes of insecticides in order to recommend the first choice of insecticide for IRS purpose in Ethiopia. Depending on the results of efficacy assessment, insecticide to use for IRS activities will be determined.

Policy/Guidelines

Preliminary results from studies done by EHNRI and the Research Triangle Institute (RTI) have identified DDT resistance and suggest that a different insecticide for IRS should be used in areas with DDT resistance. Thus, detailed mapping of DDT resistance has been conducted in all epidemiological settings of the country.

- In areas where the local vector is susceptible to DDT it will remain as an insecticide of choice for IRS. In areas where DDT resistance to the main malaria vector, *A. arabiensis*, exists, alternative insecticides will be used.
- Regular monitoring of insecticide resistance will be conducted in selected sentinel sites throughout the country to develop mechanisms for insecticide resistance management.
- Local production of alternative insecticides by the public/private sector will be encouraged and technically supported.
- Development projects, both public/and private, Ministry of Defence, and Refugee Affairs are also encouraged & technically supported to develop the capacity to perform integrated vector control activities to protect the communities under their jurisdiction.
- Quality control based on WHO standards for quality of inputs and operations for vector control will be institutionalized, maintained and updated through time.
- Procedures for safe handling & disposal of public health insecticides including insecticide treated or contaminated materials will be institutionalized in accordance with the Ethiopia's Environmental Protection Authority and WHO global regulations.

- New population settlement, tourism and temporary camps should also exercise precautionary measures in the selection of settlement sites, types of houses to be constructed and screening of houses and should involve health personnel in the design.

Overlap of LLINs and IRS will be considered in the following settings:

- hard to reach/remote areas;
- areas with the highest malaria burden (i.e. highest incidence of malaria)
- areas with special economic interest where highly effective control is needed;
- isolated foci where elimination could eventually be achieved; and
- areas with insecticide or anti-malarial drug resistance

Operational research is needed to determine the extent to which combining the two interventions would maximize the public health impact of malaria vector control and offer opportunities for management of insecticide resistance.

Objectives

Increase and maintain IRS coverage to 90% of households in IRS-targeted areas²⁴.

Targets

- Scale up IRS coverage to 90 % of the targeted areas by 2013 and maintain this coverage up to 2015.
- 100% of development projects in malarious areas will incorporate malaria preventive and control measures during planning, implementation and post implementation period.

Key Outcome Indicators

- Proportion of households in IRS-targeted areas protected by IRS in the past 12 months
- Proportion of households within IRS-targeted *Kebeles* are protected by IRS in the past 12 months
- Proportion of households with at least one ITN and/or sprayed by IRS in the last 12 months.

²⁴ IRS-targeted areas are defined through geographical reconnaissance and risk-mapping.

Activities

Annual planning and coordination for IRS

An important activity includes planning to improve the overall coordination, timing and implementation of IRS. National IRS plans need to be developed, based on information and plans from RHBs and *Woredas*. National plans will be used to improve supply distribution, fund allocation to cover operational costs and schedule the timing of IRS campaigns according to malaria epidemiology of the different areas. There is an urgent need for strengthening, in particular of the quality of vector control intervention, by updating geographical reconnaissance of target areas through census, mapping & sampling procedures (geo-coding). Another major bottleneck for IRS has been the lack of operational funding and lack of supplies to implement appropriate activities at correct times. Good annual planning at national level will assist with timely resource allocation, distribution based on regional and *Woreda* level micro-plans.

Procurement, distribution and storage of Insecticide and spray materials

Each village targeted for IRS will receive enough spray equipments for 4 spray operators and insecticides to cover all households to be sprayed as determined in the IRS plans of the district health office. Appropriate insecticides will be procured through competitive bidding by the FMOH; spray materials (e.g. pumps, spare parts, personal protective equipment) will be procured from international suppliers through PFSA. Insecticides and spray materials will be distributed to the respective regional states and districts. Health post stores will be modified to accommodate storage of insecticides and spraying materials; the district malaria team will also have some insecticides and equipment as a contingency for epidemic control.

Implementation of IRS through Health Extension Programme

Currently, IRS activities are carried out through a 4-5 member spray squad led by a squad leader; four squads make up a spray team supervised by an operation technician; IRS planning is done by the district health office malaria team. By adapting the current IRS activity structure to the HEP, sustainability of IRS in Ethiopia will be ensured by not having separate vertical, seasonal IRS operations, requiring additional financial, logistical and infrastructure resources. Role and responsibilities of the current squad leaders will be fulfilled by HEWs and the role and responsibilities of the operational technician will be fulfilled by the HEW supervisor (one supervisor oversees 5 health posts). The district health office team will continue to plan IRS activities, allocate resources and supervise spraying operations, and the members of the spray squad will continue to be seasonal spray operators. Since the HEWs and the spray operators are part of the community, the spray coverage and acceptability is expected to improve.

The HEWs will be trained to oversee and coordinate the spraying operation in their respective villages; spray operators will be trained for five days to undertake spraying operations for 25 days once a year. Spray operation activities are reported to the nearest health centre or district health offices.

Environmental compliance

The FMOH has recently developed guidelines for the safe storage, transport and application of insecticides. In order to ensure environmental compliance, the required minimum infrastructures will be established: for example, each targeted village will have an evaporation tank; a wash area to clean IRS materials including a progressive rinsing system for spray pumps, showers for spray operators, a tarpaulin to protect the rinsing holes from being filled with rain water during the rainy season; and protective fencing. A system will be put into place to retrieve and store empty insecticide sachets for safe-keeping and proper management; currently the Ministry of Agriculture sends empty sachets abroad for incineration.

Targeting localities for IRS

Targeting will be refined using national malaria risk mapping and target localities will be geo-coded using PDAs as part of geographical reconnaissance activities. Guidelines for rational targeting of IRS in non-epidemic years will be developed and decision makers at various levels will be trained. Highly epidemic prone areas will be mapped and given the first priority.

Improve local capacity

The expansion of the health extension programme is expected to minimize logistic difficulties of IRS operations. However, this will demand a huge investment in the health posts' capacity to shoulder spray operations of their respective catchment area. Regional, zonal and especially district capacity for supervision is needed to maintain a high standard of IRS operations.

Improve human resources for IRS

In order to have a decentralized IRS operation at a health post level, a critical mass of technicians and supervisors for IRS in all regions should be available, and in-service training programmes will be required for health workers involved in public health activities. For the pre-service training of health workers in health training institutions, curricula on vector control have been developed and awaiting approval by the higher authorities of the MOH & MOE. The incorporation of these curricula will solve the gap in knowledge and skill at peripheral levels.

Development project areas will be assisted to coordinate the spraying operations in their respective areas using their own funds. This will help in re-allocating operational funds and insecticides to remote rural areas, which are epidemic-prone and where there is a shortage of health facilities.

Quality of IRS operations

The timing of spray operations using different insecticides will be determined according to the local epidemiological situation. The spray equipment will be checked for functionality and new spray pumps and spare parts will be procured through donor assistance to replace non-

functional old spray pumps. Much emphasis will be given to close supervision during spraying operations by trained supervisors from the general health services.

Public acceptance, practice, and participation in IRS programmes

IRS will be supported by health education to make it acceptable to 100% of the households in the targeted villages. Health posts failing to spray more than 85% of units will review the strategy and approach of their operations and take corrective measures immediately. Intensive IEC and social mobilization campaigns will be carried out through various channels to ensure messages on IRS integrated IEC/BCC health package are used on a timely basis to educate the public about upcoming IRS campaigns.

Component 4: Active surveillance and Epidemic control

Background/ Situational analysis

To paraphrase the original global malaria eradication program (MEP): "Surveillance is the term adopted to indicate a series of epidemiologic measures (epidemiologic surveillance) and remedial measures. Epidemiologic surveillance consists in the detection of cases and the cases found to have parasites in the blood are entered into a register, submitted to radical treatment and followed up while an epidemiologic investigation of their infection and of other possible cases around them is being made. This surveillance should begin during the attack phase." Surveillance has been defined by WHO, ECM, Seventh Report as "that part of an Malaria Elimination Programme designed to discover evidence of any continuation of transmission, to establish its nature and causes, to eliminate residual foci, to prevent or cure such residual or imported malaria infection in man, as would delay the end of transmission or threaten its resumption in a given area, and, finally, to substantiate the fact that eradication (elimination) has been achieved." Thus, Surveillance is a critical intervention in this national strategy.

At the global level, the terms "epidemic" and "outbreak" of malaria have been somewhat less clearly defined, as they typically relate to changes from existing national or local baseline malaria numbers or rates. In Ethiopia, as a result of diverse topography and climate, malaria transmission patterns vary considerably geographically, seasonally and between years. The unstable nature of the transmission means that malaria has been considered an "epidemic-prone disease" in Ethiopia. The epidemics or outbreaks are usually focal but large-scale devastating epidemics have occurred at intervals of approximately 5-8 years. The last major epidemic took place in 2003 but since then, the number of reported epidemics or outbreaks has decreased (see Figure 4), and this has been attributed, in part, to the scaling up of malaria interventions.

As the nation, the regions, and sub-regions seek to reduce malaria transmission to zero, the very high coverage (seeking universal coverage) of prevention interventions (LLINs, IRS) will serve to limit transmission in communities and will mean that there is very little potential for "epidemics" or "outbreaks". Thus, the national emphasis on further reducing transmission will rely on the existing prevention coverage and additionally focus on "surveillance" - the process of finding of individual human cases, treating and performing case investigation to identify the source and possible spread, with the aim of preventing any further malaria transmission.

As Ethiopia takes the next steps to achieve universal coverage, sustain malaria control, and seek elimination, in the early phases there will remain a need for early outbreak or epidemic detection and response. This detection and response will (hopefully) rapidly evolve to become

the surveillance program identifying individual cases and infections for response as noted above.

A prerequisite for a successful surveillance and response system is accurate diagnosis based on appropriate use of RDTs and microscopy to assess and respond to all possible malaria cases and infections.

Components and actions of the surveillance system

- Deployment of surveillance actions will require that the population already has high transmission prevention interventions in place (e.g., very high IRS and/or LLIN coverage and use). It is certainly possible to link the actions that achieve the high prevention coverage to the systems that screen populations for illness and infection in an effort to clear most human infections. For example, as a community is engaged and LLINs are provided for universal coverage, active case detection (ACD) could be included where all persons with recent fever in a household are tested for malaria and treated if positive. Any household with infection could further be investigated for additional cases and these infected persons would also be treated. This process would precede (and potentially serve as a field training opportunity) and lead to the deployment of the surveillance system.
- The surveillance action will be community-based and begin with the identification of a malaria infection (either presenting as a case or identified in a population screening effort) that is recognized and lab-confirmed. The health worker will then complete a case-report-form on the infected person to assess demographic characteristics of the case, parasite species (requires microscopy), likely infection source (travel or locally acquired) and potential spread (knowledge of other symptomatic persons) and follow them to their residence to systematically assess others in the household and neighborhood to identify additional cases - through screening of all recently symptomatic persons and all/most available asymptomatic persons. Any additional identified cases will be further recorded, treated, and assessed. If there are a large number of infected persons identified, more extensive screening and treatment will be warranted according to guidelines and protocols. Prevention coverage will also be assessed and assured.

Policy /Guideline

A high quality Surveillance System with reach into all communities is an essential intervention strategy to achieve the goals and objectives in this malaria strategic plan in Ethiopia. Specifically, the system will be imbedded in the HEP and the Public Health Emergency Management system and implemented locally through these existing systems.

Objectives

- To achieve a high quality, broadly based malaria infection detection, investigation and response ‘Surveillance System’ to further reduce malaria transmission.
 - High quality* - standardized & protocol driven but flexible to address local situations
 - Broadly based* - ultimately reaching to all communities utilizing the HEP&HEW systems
 - Infection* - both symptomatic infection (cases) and asymptomatic infections; *P. falciparum* and *P. vivax*
 - Detection* - through standard diagnostic procedures
 - Investigation* - including interviewing the infected individual and household members and neighbors to identify and contain the possible source and spread of infection
 - Response* - to fully follow up the investigation to reach possible sources and spread of infection, clear those infections and stop the foci of transmission; this may include resolving inadequate prevention coverage and full treatment of all infected individuals.
 - To improve the detection and timely response to malaria epidemics
 - Detection* - through existing and enhanced (additional communications support) procedures
 - Response* - according to national guidelines on epidemic response including assessing the extent of the malaria infections/cases and rapid treatment of cases and assurance of high prevention coverage to contain further spread of infection
 - Definition of Epidemic or Outbreak* - as the national program improves, epidemics or outbreaks of malaria may be defined as the identification of a single case; this essentially constitutes the “surveillance” system described above.
- In transition from epidemic detection to surveillance as transmission declines to near zero, the coverage of the surveillance system would need to increase such that 100% of the health posts in areas seeking elimination have achieved objective 1.

Targets

Surveillance (within designated areas for malaria elimination planning)

- National Guidelines and protocols for the malaria surveillance system developed, published, distributed and available nationwide.
- Training materials for malaria surveillance system developed, published, distributed and available for training in all malarious regions.
- 100% of targeted health workforce staff (including HEWs) trained in malaria surveillance system in areas seeking elimination.
- 100% of health facilities (health posts, health centres and hospitals) in malarious areas diagnose suspected malaria cases by RDT and/or microscopy diagnosis.

Epidemics (within designated epidemic prone areas)

- National Guidelines and protocols for the malaria epidemic preparedness system are updated, to address transition from epidemic response to surveillance and HEW involvement, published, distributed and available nationwide.

- Training materials for malaria surveillance system revised according to updated National Epidemic Preparedness Guidelines, published, distributed and available for training in all malarious regions.
- 100% of health facilities in epidemic prone areas adhere to the national epidemic and response plan.
 - 100% of health facilities in epidemic prone areas have developed epidemic thresholds defined by time period using all available past data of confirmed cases.
 - 100% of health facilities and *Woreda* health offices using epidemic monitoring charts based on confirmed cases.
- 100% of all detected malaria epidemics properly controlled per the national epidemic and response plan within two weeks of onset.

Key Outcome Indicators

Surveillance (within designated areas for malaria elimination planning)

- Proportion of health facilities in malaria areas that test all fever cases (or potential malaria cases) using RDT and/or microscopy diagnosis
- Proportion of malaria infections/cases that are investigated and managed per surveillance guidelines and protocols
- Proportion of investigated malaria infections that result in the identification of additional infections among surrounding households
- Proportion of investigated malaria infections that result in the identification of the likely source

Epidemics (within designated epidemic prone areas)

- Proportion of malaria epidemics detected that are addressed as per national guidelines within two weeks from onset
 - Proportion of health facilities with defined epidemic threshold
 - Proportion of health facilities using epidemic monitoring chart
- Adequately prepared* - defined epidemic threshold based on confirmed cases and using epidemic monitoring chart

Activities

Surveillance Program development

Development of surveillance program guidelines, training materials, training agendas and materials

This includes a review of standard alert and epidemic thresholds based on confirmed cases. These thresholds may need to be revised in epidemic areas based on the documented yearly number of confirmed cases, which may suggest any detected case warrants a response.

Strengthened surveillance planning

All regions and districts will review and revise where necessary the surveillance guidelines, protocols and action plans, based on the national epidemic and response plan. HMIS, PHEM, and other available data of confirmed malaria cases will be used to prepare monthly malaria thresholds for epidemic detection at health posts, health centres and hospitals in line with the revised epidemic guidelines. Epidemic and emergency prone areas will be identified and mapped. Emergency contingency supplies and other resources will be quantified.

Pre-positioning of resources and supplies

Essential emergency resources and supplies, include the availability of trained human resources, antimalarial medicines, RDTs, LLINs, insecticides and contingency operational funds for surveillance actions, will be pre-positioned at all health posts, health centers and hospitals, as per national guidelines. The proportion of these contingency supplies required at each level will be determined and pre-positioned where necessary.

Initial deployment in elimination-designated locales

The initial deployment and learning will be critical to further guide this surveillance system. Early in the 5-yr plan, a number of geographic areas across malaria epidemiological patterns should be identified and assessed for early deployment (and learning) of the surveillance actions. Details of epidemiological and program capacity assessments are outlined in the M&E plan under the Operations Research section. The learning will include understanding the community context, logistics and management, the supply needs, the costs and budgets, the communication requirements and many other features.

Epidemic preparedness and response

Review and update the epidemic preparedness and response guidelines

This includes a review of standard alert and epidemic thresholds based on confirmed cases. These thresholds may need to be revised in epidemic areas based on the documented yearly number of confirmed cases, which may suggest any detected case warrants a response.

Strengthened surveillance and Epidemic preparedness planning

All regions and districts will review and revise where necessary epidemic preparedness and contingency plans based on the national epidemic and response plan. HMIS, IDSR, and other available data of confirmed malaria cases will be used to prepare malaria thresholds for

epidemic detection by week at all levels (health facility, *Woreda*, zone, region, federal) in line with the revised epidemic guidelines. Epidemic and emergency prone areas will be identified and mapped. Emergency contingency supplies and other resources will be quantified.

Strengthen the Early Detection System

The system will be strengthened to detect, verify and notify epidemic outbreaks, based on confirmed cases, within two weeks of the onset. The early detection system is currently based on surveillance data that includes clinical malaria cases and in-patient malaria mortality. A change to identification of confirmed malaria cases will be critical for an effective epidemic and response system. HEWs have a major role in monitoring this data and will be trained in methods of data management, analysis and interpretation as part of the integrated refresher training to strengthen the existing epidemic monitoring system. Epidemics detected through the surveillance system from confirmed cases will be verified and responded to by rapid epidemic investigation teams. Detailed emergency plans of action will be prepared in order to optimally use available personnel, finance, transportation, supplies and time.

Pre-positioning of emergency resources and supplies

Essential emergency resources and supplies include the availability of trained human resources, antimalarial medicines, RDTs LLINs, insecticides and contingency operational funds for epidemic control in all epidemic-prone areas. The proportion of these contingency supplies required at each level will be determined and pre-positioned where necessary.

Epidemic response and control measures

As per the National Guidelines, this includes focalised indoor residual spraying, rapid distribution of LLINs, social mobilization and communication to encourage use of prevention interventions and treatment seeking, intensified diagnosis and case management for both uncomplicated and severe malaria, including the establishment of outreach clinics and mobile teams.

As Ethiopia achieves sustained control and prevention of large-scale epidemics, a system may need to be established where each confirmed case is investigated. This may include the identification and mapping of transmission foci, combined with active infection detection using RDTs and treatment among households in proximity to source cases. HEW will likely play an important role in any such response.

Post-epidemic Evaluations

As per National Guidelines, this will be carried out to identify any constraints or bottlenecks in forecasting, diagnostics, early detection, prevention and/or control; and to undertake retrospective investigations on the possible causes of the epidemic. Such information helps to identify both the strengths and drawbacks of the epidemic management system and take corrective actions in the future.

Cross-cutting components

A: Monitoring and Evaluation

Monitoring and Evaluation is described in the Malaria Program M&E Plan, will measure program effectiveness. The M&E system will be used to demonstrate that the Malaria Program efforts have had measurable sustained impacts on the outcomes of interest. Monitoring will entail the routine tracking of the key elements of programme performance through record keeping, regular reporting from the health information system (HMIS), surveillance systems and periodic surveys. Monitoring will be used to verify step-by-step the progress of the malaria control program activities in order to make sure activities have been implemented as planned, ensure accountability, detect problems and constraints related to the intervention activities, and promote evidence-based planning through timely feedback to the relevant authorities. Input indicators will be used to measure the level of resources available for program implementation, appropriate policy formulation to facilitate malaria control, and coordination of partners involved with malaria control. Process indicators will be used to verify that program areas have been implemented as planned, such as verifying that ITNs have been purchased and are ready for distribution. It is expected that inputs and desired processes will lead to desired changes in output indicators, which will be used to measure benchmarks of program-level performance, such as the number of ITNs distributed to a particular region or district.

B. Human Resources Development

The existence of adequate numbers of skilled, motivated and well supported health workers is essential for the delivery of an efficient health service as well as for the achievement of health related Millennium Development Goals (MDGs). Development of human resources with emphasis on frontline and middle level professionals is one of the priorities identified by the Health policy of Ethiopia as well as in the successive phases of HSDP. Ethiopia is addressing human resources (HR) development through: rapid scale up of HR; prioritizing primary and mid-level training; and ensuring the quality of training so as to make it of acceptable professional standards. During HSDP II and III, significant progress has been made in the training and deployment of lower and middle level health professionals notably, health officers, nurses and health extension workers.

The FMOH has carried out a number of innovative HR reforms aimed to meet the demands of its health targets, particularly for AIDS, TB, and malaria. The center-piece of these reforms is the HEP. Malaria control has benefited significantly from these recent human resource developments. The roll out of over 30,000 health extension workers to health post level has significantly increased the coverage of malaria prevention and control interventions along with access to other crucial services such as immunization, reproductive health, safe delivery, and newborn care.

There is preliminary evidence that suggests that the HEWs have significantly impacted access to health services. However, the challenge currently is that as interventions are scaled up, HEW workload increases and there is a demand for more skilled training and supervision.

FMOH is seeking to address this challenge through the following activities:

- Improving HEW training capacity: strengthening pre-service training and Integrated Refresher Training (IRT) and supporting HEWs during apprentice training.
- Improving HEW supervision support: strengthening training of newly appointed HEW supervisors and procuring motorcycles for HEW supervisors to ensure continuous and timely supervision.
- Upgrading HEWs to level IV (nursing level) according to Ethiopian Ministry of Education standard.

While these strategies will support FMOH's goals of strengthening the HEW program towards sustaining malaria control and improving overall health services, additional challenges will need to be addressed to support reaching the goal of malaria elimination by 2020. Ethiopia's success in malaria depends on the HEWs to roll out essential malaria prevention and control interventions as part of an integrated health package. In order to leverage these HEWs towards moving from sustained control towards elimination in some areas by 2015 and country-wide by 2020, there must be both increases in technically trained malaria professionals and improved training for the existing workforce.

To meet this challenge, the FMOH is carrying out two key initiatives: Firstly, the FMOH will carry out a comprehensive malaria control programme HR workload analysis to determine levels of current and required HR level and skills to meet malaria control programme targets at central, regional, district and community levels. This will provide evidence-based information for programme managers to advocate for improvements in HR staffing levels, training and other HR initiatives such as retention schemes. Secondly, for current staff, the FMOH is strengthening malaria-specific training through the Adama Malaria Training Centre, including ensuring up-to-date curricula. In line with FMOH has conducted malaria specific training for around 180 HWs in 2010 alone. The malaria programme HR initiatives will conform to the national health sector HR strategic plan.

Policy/ Guidelines

Ethiopia's health sector reforms reflect the government's commitment to a decentralized, sustainable health system. The HR policy foundation is the Health Human Resource Development Strategy (HRDS) and the Civil Service Reform Programme (CSRP), with the major objective of providing a sustainable supply of highly competent, qualified health workers at all levels. This will be largely achieved through several innovative initiatives including: the HEP; investment in building effective supervisory infra-structures; an ambitious national training strategy that incorporates up-to-date malaria training curricula and a "cascade" training model that ensures sustainable training at decentralized level; and, several other initiatives to improve staffing mix and efficiencies such as task shifting.

Objectives

To strengthen the existing human resource capacity working on malaria control and prevention at all levels of the health system:

- management level at RHBs, zones/ woredas, and community, and
- health workers at hospitals, health centres and health posts

Targets

- 30,000 HEWs receive Integrated Refresher Training (IRT) with updated national malaria strategy module.
- All hospital and health centre staff will receive refresher training on malaria prevention and control activities, including treatment of severe malaria
- All management (relevant) staff at FMOH, RHBs, zones/ *Woredas*, *PHCU* and community level will receive training in malaria management, monitoring and evaluation

Key Indicators

- Number of HEWs who received training
- Number of health professionals who received training specifically on malaria
- Number of management level staff who received training

Activities

Improve capacity of peripheral health workers in the diagnosis, case management, prevention and control of malaria

Health Extension Workers will be trained through IRT in diagnosis and treatment of malaria, case referral, IRS and distribution of mosquito nets. The IRT also includes behaviour change communication, monitoring and evaluation, surveillance and epidemic preparedness and response. Furthermore HEWs will be trained in integrated community case management (ICCM) to effectively manage febrile cases at community level. Updated guidelines, treatment algorithms and job aides will be provided to reinforce training. Supportive supervision from HEWs supervisors will re-enforce training.

Improve capacity of RHB, District Health Office, hospital and health centre staff in malaria prevention and control

Training in improved diagnosis, treatment, vector control, M&E and overall planning will be provided to regional and district level health staff. Training will then cascade down to HEW supervisors. Regional-level “resource trainers” will be trained for two months at the Adama Malaria Training Centre. The regional “resource trainers” will provide a one-month training programme, at 11 regional level venues, to district malaria focal points. They will also train sentinel surveillance site health information officers and laboratory technicians. Equipment such as computers will be procured to enhance performance of staff in management, stock control and monitoring. Additionally health extension worker supervisors will be provided with motor bikes to enhance support supervision and in-service training.

Improving evidence-based HR planning

A malaria control workload analysis will be carried out to determine the level of effort by cadre, sector (i.e. public, civil society and private) and level (central, regional, district and village) required to meet Malaria Programme goals. A set of models applied in other countries will be adopted to develop an Ethiopian-specific HR malaria planning tool and guide. This activity will be integrated with other sector-wide situational analysis currently taking place in collaboration with the FMOH HR Department.

C: Financial Management and linkages with Overall Development Strategy

This section outlines the following: (a) the overall national budget process, including public sector financial management and reporting mechanisms; (b) the specific financial and related management arrangements which will guide implementation of the 2011-2015 NSP, in line with Ethiopia's International Health Partnership (IHP+) Compact²⁵ - the overarching framework for the coordination of all health sector financing; and (c) the linkages of this Strategy with the country's overall development strategy embodied in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP), the overall objectives of which underpin both the national budgeting process and Ethiopia's IHP+ Compact.

The national budget process

The Ethiopian budget process reflects the decentralized structure of the country's administrative and fiscal system. The national budget is processed at federal, regional, zonal (in some regions), district (*Woreda*) and municipality levels. The budgeting process officially starts with the issuing of the budget preparation note to the Budgetary Institutions (BIs). Based on the budget manual, the BIs prepare their budgets in line with the budget ceilings and submit these to the Ministry of Finance and Economic Development (MOFED) within six weeks following the budget call.

The annual sectoral budgets are first reviewed by MOFED and then by the Council of Ministers. The final recommended draft federal budget is submitted to parliament in early June and is expected to be cleared at the latest by the end of the Ethiopian Fiscal Year (EFY). GOE is currently working to further streamline and enhance the transparency of the national budget process particularly in the areas of administration of federal transfers, inter-sectoral allocation, and budget reviews.

For the health sector, domestic revenues are largely allocated for covering recurrent expenditures, such as salaries and human resource development costs (including, notably, the training and salaries of health extension workers), with additional spending on limited commodity procurement (e.g. in the case of malaria, insecticides for IRS are routinely procured with treasury funds). To date, development partners have largely financed fixed costs and commodity inputs (e.g. LLINs, ACTs, RDTs, etc), and in some cases, the refurbishment of health facilities (including supplies).

25 FMOH. 2008. Compact between the Government of the Federal Democratic Republic of Ethiopia and the Development Partners on Scaling Up For Reaching the Health MDGs through the Health Sector Development Programme in the framework of the International Health Partnership. Federal Ministry of Health, Ethiopia. August 2008.

http://www.internationalhealthpartnership.net/ihp_plus_countries.html

Major inputs for malaria control financing can be split into two general categories:

- Federal level program and operational expenditures (other than commodity procurement and distribution costs);
- Regional and *Woreda* level expenditures

Financial regulations of regions require that *Woredas* submit monthly financial statements to regions 15 days after the end of each month. MOFED is currently accelerating roll-out of the computerized IBEX system to all regions with a view to facilitating the timely production of financial reports. Currently, regions submit annual financial statements to MOFED for consolidation and also for program monitoring. MOFED in turn, is expected to produce consolidated quarterly financial reports to be submitted to Development Partners.

IHP+ Compact: Overarching arrangements for health sector financing management and oversight

Ethiopia's IHP+ Compact, which came into effect in August 2008, provides the overarching framework for coordination of official development assistance (ODA) to the country's health sector and sets out the relevant guiding principles and management arrangements that are to be observed by the Government of Ethiopia (represented by FMOH and MOFED) and signatory Development Partners (FMOH, 2008). The Compact aims to increase and enhance the effectiveness of aid with a view to accelerating Ethiopia's progress towards the Health MDGs. It complements and builds on key principles of harmonization and alignment reflected in preceding agreements (including, in particular: the vision of "one-plan, one-budget, one-report" based on country-led processes, as well as agreed funding mechanisms that allow for harmonized channels of financial resource management).

In line with the Ethiopia's IHP+ Compact, decisions on the allocation of Government and external resources within the health sector are taken through the overall national planning budget process outlined above. Allocation of resources for the health sector provided through the Government preferred channels is guided by HSDPIII priorities which are directly aligned with the health-related MDGs. For the health sector, the Government preferred modes of financing of the Government of Ethiopia are: i) the block-grant to the *Woredas* ii) the MDGs Performance Fund ("MDG Fund"). The block grant channel, which is under the control of *Woreda* councils, finances recurrent costs including wages, maintenance and operating costs. The MDG Fund, which is managed by FMOH, provides specific federal grants for public goods (e.g. procurement/supply of commodities such as LLINs and vaccines) and capacity building activities, including upgrade of infrastructure and logistics and training.

The Compact builds on the health sector's three-tier collaborative governance system (set out in *The Code of Conduct to Promote Harmonization in the Health Sector of Ethiopia signed between Government and Development Partners in September 2005*) which comprises:

the Central Joint Steering Committee (CJSC- which convenes FMOH and Health Population and Nutrition Partners), responsible for overall monitoring and follow-up of the implementation of the HSDP, the Joint Consultative Committee and the Joint Core Coordinating Committee which serves as a technical arm of CJSC.

Accordingly, implementation of this Strategy will be guided by key principles and harmonized health sector management arrangements established by the Compact.

Implementation of the Strategic Plan will be led by the FMOH, with management responsibilities shared by the FMOH's Directorate of Planning and Finance and the Malaria Programme. In line with the Compact, monitoring and follow-up of the implementation of the core activities will continue to be overseen by the CJSC and the Regional Joint Steering Committees at federal and regional levels, respectively.

Global Fund-specific programming is overseen by the Country Coordinating Mechanism (CCM), which is chaired by the Minister of Health. The FMOH is responsible for ensuring coordination between the CCM and Central and Regional Joint Steering Committees.

Finally, a malaria-specific Steering Committee (MCST) has been established and chaired by MOH with participation from partners with specific malaria-expertise.

Linkages with Broader Development Framework

The 2011-2015 National Malaria Control Strategy is embedded within the broader framework of the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) and the Health Sector Development Program (HSDP IV).

As one of the country's leading health problems, and in line with MDG6 targets, malaria control constitutes one of the four priority areas of the HSDP-IV. The PASDEP, Ethiopia's five year second PRSP and development plan covering the period through 2010, builds on the development strategies pursued under the preceding Sustainable Development and Poverty Reduction Program (SDPRP), maintains a strong emphasis on human development as the basic building- block for broad-based and inclusive growth. PASDEP reinforces Government's pro-poor spending on basic services - education, health, agriculture, and natural resources (including water) - which are fundamental to achieving Ethiopia's MDG targets and for which expenditures are projected to increase significantly. The PASDEP recognizes that investments in health, and specifically, in aggressive interventions against malaria can have a significant and direct impact on the preservation and accumulation of human capital and thus on economic growth and the country's overall development.

D: Equity

Malaria affects all population groups, regardless of their sex, age, urban or rural residence, education or wealth status. Because of the particular epidemiological characteristics found in Ethiopia, with highly variable transmission intensity and very little acquired immunity to the disease, all age groups are vulnerable to infection and disease. Malaria is more prevalent in rural areas. Though the disease affects all age groups, young children are somewhat more susceptible to severe illness and death simply due to their young age and still-developing immune system, and pregnant women are more susceptible to illness. Ethiopia has collected and assessed a variety of gender, age, and residence information regarding malaria infection and malaria prevention. Service provision is similar for boys and girls and women and men as evidenced by ownership and use of ITNs, the frequency of fever and use of diagnosis and treatment for malaria. And, to date, because of emphasis on reaching populations at higher risk, many of the malaria interventions of the program have been focusing on remote rural and poor communities and are clearly reaching young children and women of reproductive age.

Universal coverage

One of the HSDP IV main objectives is to cover all rural villages with the HEP to achieve universal primary health care coverage. To reach the most remote communities, the government has massively scaled-up the health care infrastructure, so that all villages in the country have access to a health facility within a 5 km radius. In order to ensure universal access to prevention and treatment, including to the poorest population groups, all the interventions described in this Strategic Plan are free-of-charge and will be distributed, completely or partially, through the HEP. This ensures that all social groups, disadvantaged poor rural communities, and previously inaccessible areas will have access to health services.

Ensuring access to women and children/adolescents

All HEWs in Ethiopia are women, which increases access of women to health care. The HEWs are expected to spend less than 20% of their time in health posts, and more than 80% of their time will be with households, mothers and children. Indeed, most women find it easier to seek treatment from women rather than men. In addition, as women are the primary caretakers of children, this also ensures that children benefit from healthcare. The close proximity of the HEWs to the population will enable them to identify those individuals most in need and ensure that they have access to malaria prevention and treatment. As men are most often the decision-makers in households, specific attention will be given during the scale-up of BCC activities (e.g. Community Conversation Strategy) to encourage malaria prevention, but also more equitable household-decision making. Children and adolescents will also participate in advocacy and malaria education through school clubs.

E: Procurement and Supply Chain Management

The management of pharmaceuticals and health products is detailed in the Procurement and Supply Chain Management (PSM) Plan. The PSM Plan will be updated to reflect the scope of this National Strategic Plan.

The Pharmaceutical Fund and Supply Agency (PFSA) handles and coordinates the overall procurement and supply management of health products in the country since 2007. The establishment of this agency is based on the FMOH's five-year Logistic Master Plan, which calls for the establishment of a new health commodities supply system for the public sector in Ethiopia. The new distribution structure emphasizes logistics efficiency by using a hub warehouse network system based on population density, geography and routing. Warehousing and transport costs are balanced and logistics capacity is concentrated in a relatively small number of hubs. The warehouse system consists of both primary and secondary warehouses, depending on geographical location and accessibility, as well as population catchment areas (the former usually serving a larger catchment area than the latter). All health products are procured through the PSA. However, whenever the agency finds that it has not enough capacity to handle the procurement of certain items, or when it identifies bottlenecks that might delay the process, it can outsource the procurement to other capable agents, such as UNICEF. As the agency is accountable to the FMOH, they will work closely to anticipate needs, plan procurement and distribute products. Distribution follows the existing delivery system, extending from the central level all the way down to the beneficiary. Some commodities, such as LLINs, are delivered to the regional stores directly from port of entry and subsequently to districts and to beneficiaries. In some cases, the distribution from the port to the central/regional level is contracted out to capable national transportation agents to support the national effort, but distribution to districts and to beneficiaries is carried out by the regional and district levels. These levels have the capacity to deliver these items.

F: Operational Research

A number of operational research (OR) studies to be carried out have been identified already. As Ethiopia continues its fight against malaria, towards pre-elimination, additional needs for OR will be identified by the MCST/TAC throughout the implementation of this National Strategic Plan, in collaboration with RHBs and research institutes. Operational studies that are relevant to the context of the regions will also be supported, to ensure regions apply interventions which are well suited to the local circumstances.

Targets

- 100% Operational research studies completed.
- Proportion of ORs disseminated using various channels.

Activities

Operational Research 1: Insecticide susceptibility studies. Effectiveness of IRS depends on the continued susceptibility of *Anopheles* mosquitoes to insecticides used in IRS. Data collected between 2001 to date shows that susceptibility of *Anopheles gambiae s.l.* to major classes of insecticides is variable depending on geographical region. Insecticide efficacy studies according to standard WHO protocols will be done in collaboration with EHNRI at 25 selected sentinel sites (see above) once every two years.

Operational Research 2: Drug efficacy studies. To ensure continued effective case management, resistance to currently recommended anti-malarial drugs needs to be monitored regularly. Drug efficacy studies based on standard WHO protocols will be carried out by EHNRI and in-country stakeholders in 25 sentinel sites every two years.

Operational Research 3: Monitoring longevity of LLINs under field conditions. In order to determine LLIN longevity, both in terms of physical integrity as well as insecticidal residual efficacy, a sample of LLINs are going to be collected in 50 rural communities around established malaria sentinel sites. LLINs will be inspected for their physical integrity (e.g. number of holes, area size of holes) and tested for their residual insecticidal efficacy using WHO protocols. The results of the study will be critical in the development of a national LLIN replacement strategy and education.

Operational Research 4: KAP study on malaria interventions. Planning for proper utilization of key malaria interventions requires assessing the community knowledge, attitude and practice (KAP) on malaria, malaria interventions, health services and their delivery. Comprehensive KAP surveys in order to better design and tailor intervention strategies (e.g. preference of

interventions, including size, shape and color of LLINs) will be carried out by FMOH and in-country stakeholders.

Budget

The overall budget for the 2011-2015 National Strategic Plan is US\$. It is not equally distributed every year, reflecting the fact that LLINs (which represent the most expensive intervention - due to the price of the commodity itself) need to be replaced regularly.

It is difficult at this time to anticipate the funding commitments of Ethiopia's partners. Ethiopia has secured funding through its GFATM Round 8 proposal, and benefits from a strong partnership that is expected to continue its funding commitment: The Carter Center (TCC), WB, USAID (including PMI), WHO, UNICEF, UNITAID, MACEPA, PSI. All the partners buy into the National Strategic Plan, and the MCST ensures that activities are not duplicated.

Table 3. Indicative Budget Requirement (2011 - 2015)

No	Component	2010	2011	2012	2013	2014	2015	Total
1	Community empowerment and mobilization	16,521,229	16,285,230	14,607,540	13,824,990	17,359,190	16,626,640	95,224,819
2	Diagnosis and Case management	52,816,828	51,180,753	48,663,868	46,041,825	40,684,566	34,543,372	273,931,212
3.1	Selective vector control 1 LLIN	48,710,461	17,329,025	83,048,358	52,883,460	33,022,651	87,441,174	322,435,132
3.2	Selective vector control 2 IRS	65,123,537	70,552,175	50,990,265	64,114,627	58,251,194	63,180,763	372,212,561
4	Active surveillance and epidemic control	2,202,652	2,235,860	2,031,836	1,855,624	2,027,326	1,043,474	11,396,772
6	M&E and Operational research	13,632,484	11,771,310	771,310	1,919,345	1,012,109	2,237,635	30,332,084
GRAND TOTAL		199,007,191	169,354,353	200,113,177	180,639,871	151,344,927	205,073,058	1,105,532,577