

# Ethiopia National Malaria Indicator Survey

## 2007

### Technical Summary



**FEDERAL DEMOCRATIC  
REPUBLIC OF ETHIOPIA  
MINISTRY OF HEALTH**

2008

## Background

Malaria is seasonal in most parts of Ethiopia, with unstable transmission that lends itself to the outbreak of epidemics. The transmission patterns and intensity vary greatly due to the large diversity in altitude, rainfall, and population movement; areas below 2,000 meters (m) are considered to be malarious (or potentially malarious). Those areas are home to approximately 68% (52 million) of the Ethiopian population and cover almost 75% of the country's landmass.

The fight against malaria is governed by a five-year strategic plan for 2006–2010 based on malaria control interventions that include distribution of insecticide-treated nets (ITNs), indoor residual spraying (IRS), and prompt and effective treatment with artemisinin-based combination therapy (ACT). Only those areas below 2,000m of altitude are targeted to receive key malaria control interventions, which occur at different levels of the health system, based on criteria such as altitude, morbidity data, and history of epidemics. IRS is conducted only in selected villages within the malarious areas (below 2,000m) and is scheduled to reach 60% of target areas by 2010.

In 2005, the program launched a massive scale-up of key interventions. At that time, the country moved to ACTs for the treatment of uncomplicated malaria and scaled up access to Coartem<sup>®</sup>. By the time of the 2007 malaria indicator survey (MIS), approximately 17 million nets had been distributed to malarious areas of the country.

A demographic and health survey (DHS) took place in Ethiopia in 2005 before this scale-up occurred. In order to evaluate progress, in 2007 the Federal Ministry of Health (FMoH) conducted an MIS, applying the Roll Back Malaria Monitoring and Evaluation Reference Group tool that uses similar methods to DHSs and multiple indicator cluster surveys. For this survey, the FMoH had several key partners: the Central Statistics Agency; the World Health Organization; the United States Agency for International Development; the US Centers for Disease Control and Prevention/President's Malaria Initiative; The Carter Center; the United Nations Children's Fund; the Center for National Health Development in Ethiopia; the Malaria Consortium; and the Malaria Control and Evaluation Partnership in Africa (MACEPA), a program at PATH.

## Objective

The 2007 Ethiopia MIS was conducted to evaluate the coverage of key malaria control interventions and to assess progress towards national strategic goals.

## Methods

The MIS was based on a two-stage cluster sample design of 8,525 households (HHs). The sample was designed to generate nationally representative data, but also to accommodate specific partner needs, providing regional data for Oromiya and zonal estimates for Amhara. All enumeration areas in the country in villages with a mean altitude lower than 2,500m were stratified to provide the following estimation domains:

- National (country): urban for altitudes between 1,500m and 2,500m
- National (country): rural for altitudes between 1,500m and 2,500m
- National (country): for altitudes below 1,500m

- Zonal for Amhara
- Regional for Oromiya

The survey was conducted during October, November, and December 2007 (malaria transmission season) by 25 teams, using standard questionnaires programmed into personal digital assistants (PDAs).

In each selected enumeration area, all households were mapped, and 25 households were randomly selected by the PDA program. Interviews regarding household characteristics and nets were conducted in those 25 households.

Blood samples were taken from all children under age five years in every household and from persons of all ages in eight randomly selected households per enumeration area. Malaria parasite testing was done using ParaScreen<sup>®</sup> rapid diagnostic tests to facilitate case management during the survey, and both thick and thin smear blood slides were taken to assess malaria infection rates. Hemoglobin testing for anemia was done using Hemocue Hb 201 analyzers for children under age five years.

## Results

The total number of persons residing in the sampled households was 32,380, including 16.7% children under age five years and 1.8% self-reported pregnant women. Interviews regarding reproductive history, fever treatment, and malaria knowledge were conducted with 6,657 women of childbearing age. A total of 10,578 blood slides and 4,846 anemia tests were examined.

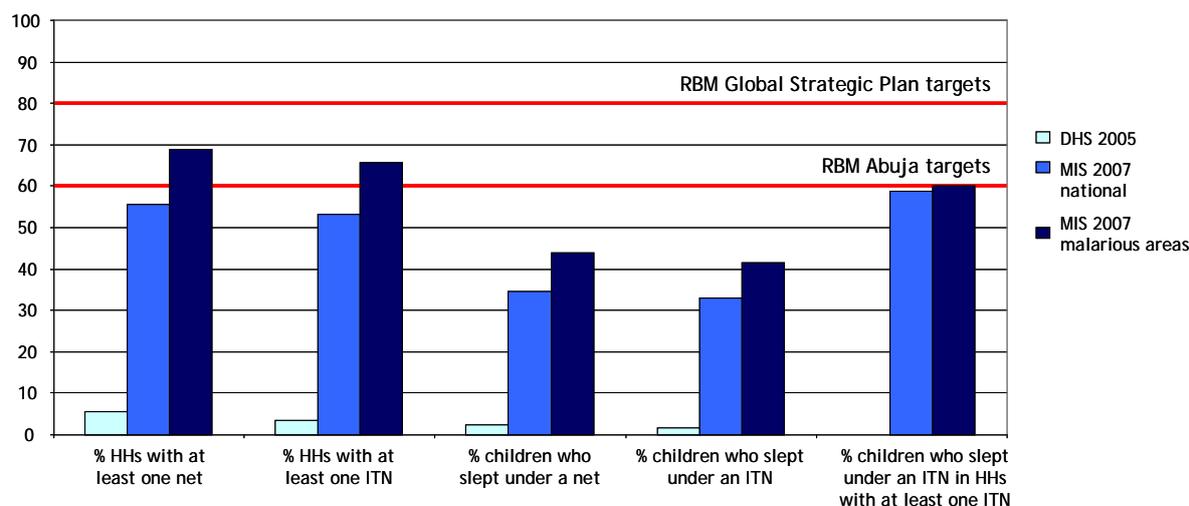
### **Mosquito net and ITN coverage and use**

National ITN<sup>1</sup> coverage rates increased from 3.4% in 2005 to 53.3% in 2007. In malarious areas (below 2,000m), 65.6% of households now own at least one ITN. While only 1.5% of children under age five years were reported to have slept under an ITN the night preceding the survey in 2005, this percentage is now up to 33.1% nationwide and 41.5% in malarious areas (Figure 1). Not surprisingly, use increases with ownership, as the MIS 2007 shows that an average of 60% of children under age five years had slept under an ITN the night preceding the survey in households that owned at least one ITN, in malarious areas and also nationwide. In malarious areas, 65.7% of pregnant women in households with at least one ITN had used it the night preceding the survey.

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<sup>1</sup> An insecticide-treated net (ITN) was defined as (i) a factory-treated net not requiring re-treatment, (ii) a pre-treated net that was obtained less than 12 months ago, or (iii) a net that had been soaked/re-treated less than 12 months ago.

**Figure 1:** Net ownership and use among children under age five years, 2005 and 2007.

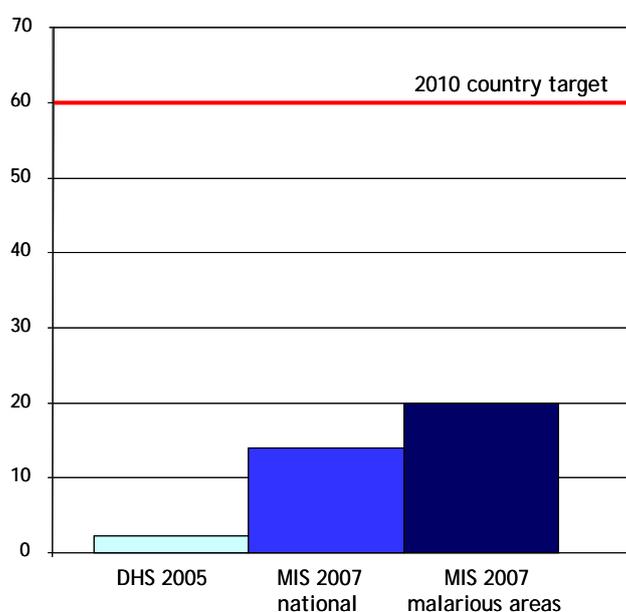


### Indoor residual spraying

IRS is targeted to epidemic-prone areas of the country, where the FMOH estimates 44.2% of the population lives. The data presented in Figure 2 are for nationwide and malarious areas (below 2,000m), but are not available for those specific areas only.

In 2005, 2.3% of houses had been sprayed in the six months preceding the survey. In 2007, 14.5% of houses had been sprayed on average 5.1 months before the survey (Figure 2).

**Figure 2:** Percentage of houses that received indoor residual spraying, 2005 and 2007.

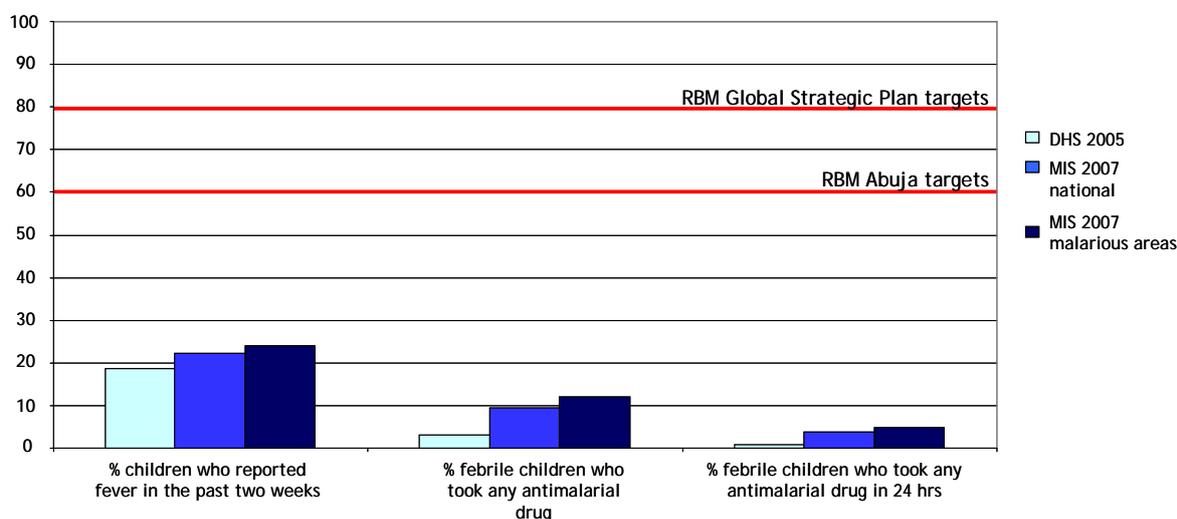


### Prompt, effective case management

Overall, 22.3% of children under age five years reported a fever in the two weeks preceding the survey (Figure 3). Of these, 15.4% sought medical attention within 24 hours of onset of fever, 9.5% took an antimalarial drug, and 3.9% took the drug the same day of fever onset. Among those who were treated with an antimalarial drug, 41.3% took an antimalarial within 24 hours of onset of fever, and 42.6% of children surveyed in 2007 who had received an antimalarial had received Coartem<sup>®</sup>.

Among the febrile children who were treated with an antimalarial the same day of fever onset, 6.7% sought their treatment from a health extension worker, 27.6% from another level of government health facility, 36.4% from private health providers, 12.8% used home treatment, and 1.5% sought treatment from shops (data not shown).

**Figure 3:** Fever prevalence and use of antimalarial drugs among children under age five years, 2005 and 2007.



### Malaria parasitemia

By microscopy, parasite prevalence in all ages was 0.7%, with 76% of infections being *P. falciparum* (Table I).

**Table I:** Parasite prevalence rates, by species and location, 2007

	Parasite prevalence (%)		
	<i>P. falciparum</i>	<i>P. vivax</i>	Total
Nationwide	0.5	0.2	0.7
Malarious areas (below 2,000m)	0.7	0.3	0.9

## Severe anemia

Severe anemia (HB<8g/dl) was found in 5.5% of children under age five years (Table 2) and peaked in children ages two to three years at 8.5%. The percentage of children from poorer households suffering from severe anemia was greater than the percentage of children from wealthier households (7.2% in the poorest quintile vs. 2.8% in the wealthiest quintile). More children living in malarious areas (below 2,000m) were anemic than children living at higher altitudes (6.6% below 2,000m vs. 3.1% above 2,000m).

**Table 2:** Severe anemia prevalence among children under age five years, 2007

	Percent of children under age five years with severe anemia (H<8g/dl)
<b>Nationwide</b>	5.5
<b>Malarious areas (below 2,000m)</b>	6.6

## General malaria knowledge

Across the country, 74.6% of women ages 15–49 years reported having heard of malaria (Table 3), a percentage that was only slightly higher in malarious areas (79.5%). However, in malarious areas, only 38.2% of women mentioned mosquito nets as a prevention method, and just over 50% recognized fever as a symptom of malaria. Knowledge levels increased with education and were higher in urban than in rural areas.

**Table 3:** Malaria knowledge among women ages 15–49 years, 2007

	Percent who had heard of malaria	Percent who reported mosquito bites as a cause of malaria	Percent who reported mosquito nets as a prevention method	Percent who recognized fever as a symptom of malaria
<b>Nationwide</b>	74.6	35.8	32.8	44.4
<b>Education</b>				
None	70.1	27.9	26.0	39.6
Primary	82.0	47.7	38.4	49.8
Secondary	93.8	72.1	70.6	68.2
Higher	98.1	79.5	85.3	76.2
<b>Residence</b>				
Rural	71.0	30.1	26.5	39.5
Urban	89.5	59.7	59.4	64.8
<b>Malarious areas (below 2,000m)</b>	79.5	41.1	38.2	50.8

## Conclusions

The 2007 Ethiopia MIS results show the remarkable progress the country has made in its fight against malaria in the past two years, especially in scaling up prevention interventions.

- ITN coverage has increased 15-fold.
- Over 95% of the nets in Ethiopia are long-lasting insecticidal nets.
- In malarious areas, 66% of households are protected by at least one ITN.
- In malarious areas, ITN use by children under age five years and pregnant women has increased to nearly 42% and to over 60% in those households that own 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.
- There has been only a slight increase in malaria care-seeking behavior, but 43% of children under age five years who took an antimalarial in the two weeks preceding the survey had been given the recommended ACT.

This success is the result of committed leadership, availability of funding, and a strong partnership. Continued investment from the country and its partners is essential to sustain high coverage, increase use, and improve diagnosis and effective treatment. Efforts are needed to:

- Sustain universal access to ITNs.
- Ensure scale-up of IRS activities to reach all targeted areas.
- Ensure proper diagnosis of fever cases to ensure appropriate use of drugs.
- Ensure that behavior change communication activities reach all those at risk of malaria, to increase use of prevention interventions and promote treatment-seeking behavior.

By increasing knowledge among those at risk, the program expects to observe an even greater impact in years to come.

These results suggest that the high coverage of prevention interventions in Ethiopia has contributed to containing parasite prevalence, therefore reducing the risk of deadly epidemics. In addition to sustained coverage, strengthened surveillance systems will be required to rapidly detect and provide an immediate and appropriate response to potential outbreaks.

By successfully scaling up effective malaria prevention interventions in a short time period, Ethiopia has shown that political will and partnership can set the stage for winning the fight against malaria. With ongoing investment, Ethiopia can create an epidemiological and programmatic environment that will enable the country to move towards elimination.

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