ZAMBIA NATIONAL MALARIA INDICATOR SURVEY 2010

Technical Summary

Government of the Republic of Zambia, Ministry of Health

Background

Malaria is endemic throughout Zambia and remains a major public health problem. In 2006, the Zambian Ministry of Health (MoH) developed a detailed five-year National Malaria Strategic Plan (NMSP) aimed at significantly scaling up malaria control interventions towards achieving the national vision of "a malaria-free Zambia." The National Malaria Control Centre (NMCC), together with multiple partners, committed to aggressively scaling up its major malaria control interventions in order to achieve a 75% reduction in malaria incidence by 2011. Core interventions include prevention with insecticide-treated nets (ITNs), indoor residual spaying (IRS), and intermittent preventive treatment (IPT) during pregnancy, as well as diagnosis and treatment with artemisinin-based combination therapy.

In order to assess progress towards its ambitious targets, the MoH conducted Malaria Indicator Surveys (MISs) in 2006 and 2008. As part of the ongoing evaluation of its strategic plan, and in order to orient the development of the upcoming 2011–2015 NMSP, the MoH conducted a follow-up MIS in April and May of 2010. An overview of the results of this effort, as well as a comparison with the 2006 and 2008 data, is summarized in this document. The full MIS 2010 report can be downloaded from the publications page of the NMCC website (http://www.nmcc.org.zm/publications.htm).

Objectives

The objectives of the 2010 MIS were:

- To collect up-to-date information, building on the experience of the 2006 and 2008 MIS, on coverage of the core malaria interventions included in the 2006–2010 NMSP.
- To assess malaria parasite prevalence.
- To assess the status of anaemia (and severe anaemia) among children under five years of age.
- To assess disparities in malaria intervention coverage, and malaria parasite and anaemia prevalence among the surveyed population by location and other background characteristics.
- To implement standardized, representative household survey methods.
- To strengthen the capacity of the NMCC and local agencies involved in order to facilitate the implementation of surveys of this type in the future.

Methods

The MIS was based on a nationally-representative, two-stage cluster sample of 4,500 households. Households were surveyed from 180 Standard Enumeration Areas (SEAs) randomly selected to provide representative national, urban, and rural estimates. Sample sizes were calculated based on an expected reduction in parasitaemia levels among rural populations that participated in the 2008 MIS. Additional sampling was added for households falling within newly sprayed areas covered by IRS activities since 2008.

First-stage sampling was conducted by the Central Statistics Office, while the second-stage sampling was conducted by field teams using personal digital assistants (PDAs) fitted with geo-positioning systems. In each selected SEA, all households were listed, and 25 were randomly selected by the PDA program. Data collection occurred during March and April of 2010.

In sampled households, blood samples were drawn from consenting children under six years of age. Malaria parasite testing was done using a rapid diagnostic test (RDT) to enable case management during field work, and a thick blood slide sample was taken to assess malaria parasitaemia. Haemoglobin testing for anaemia was done using Hemocue® spectrophotometers.

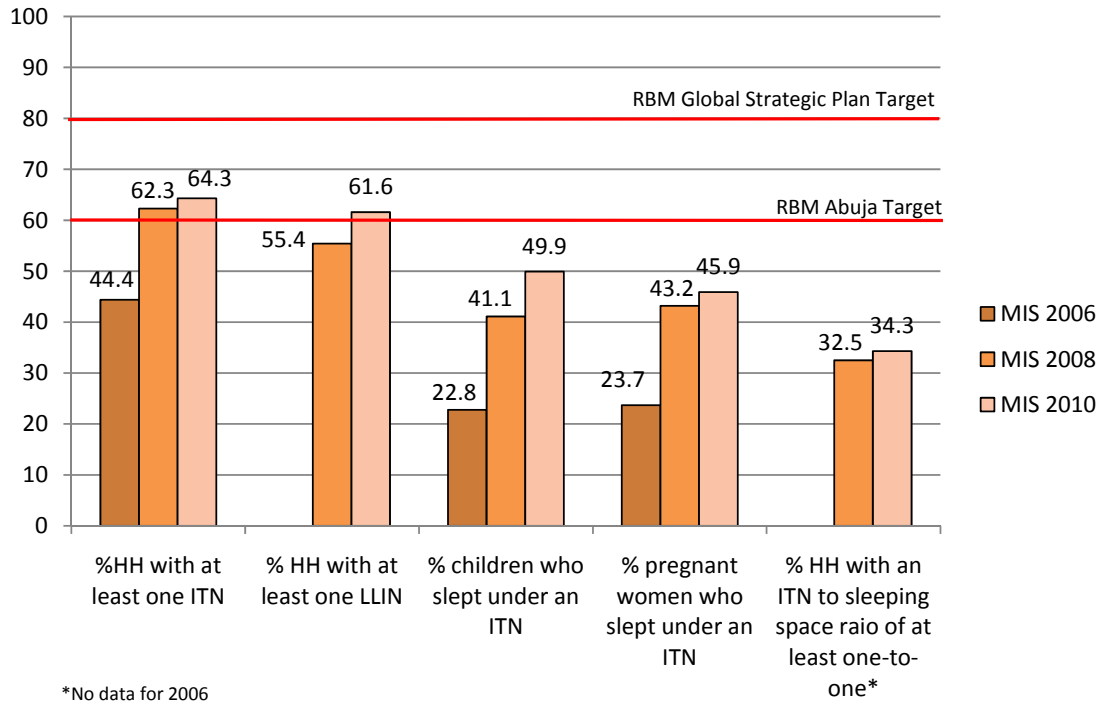
Results

Of the 4,500 households selected for the survey, 97.2% were successfully interviewed from 4,485 occupied households, representing a total of 20,042 persons. Interviews regarding reproductive history, fever treatment and malaria knowledge were conducted with 4,009 women aged 15 to 49, 1.7% of which reported being currently pregnant. A total of 3,162 blood samples were obtained from children under five years of age and examined.

ITN coverage and use

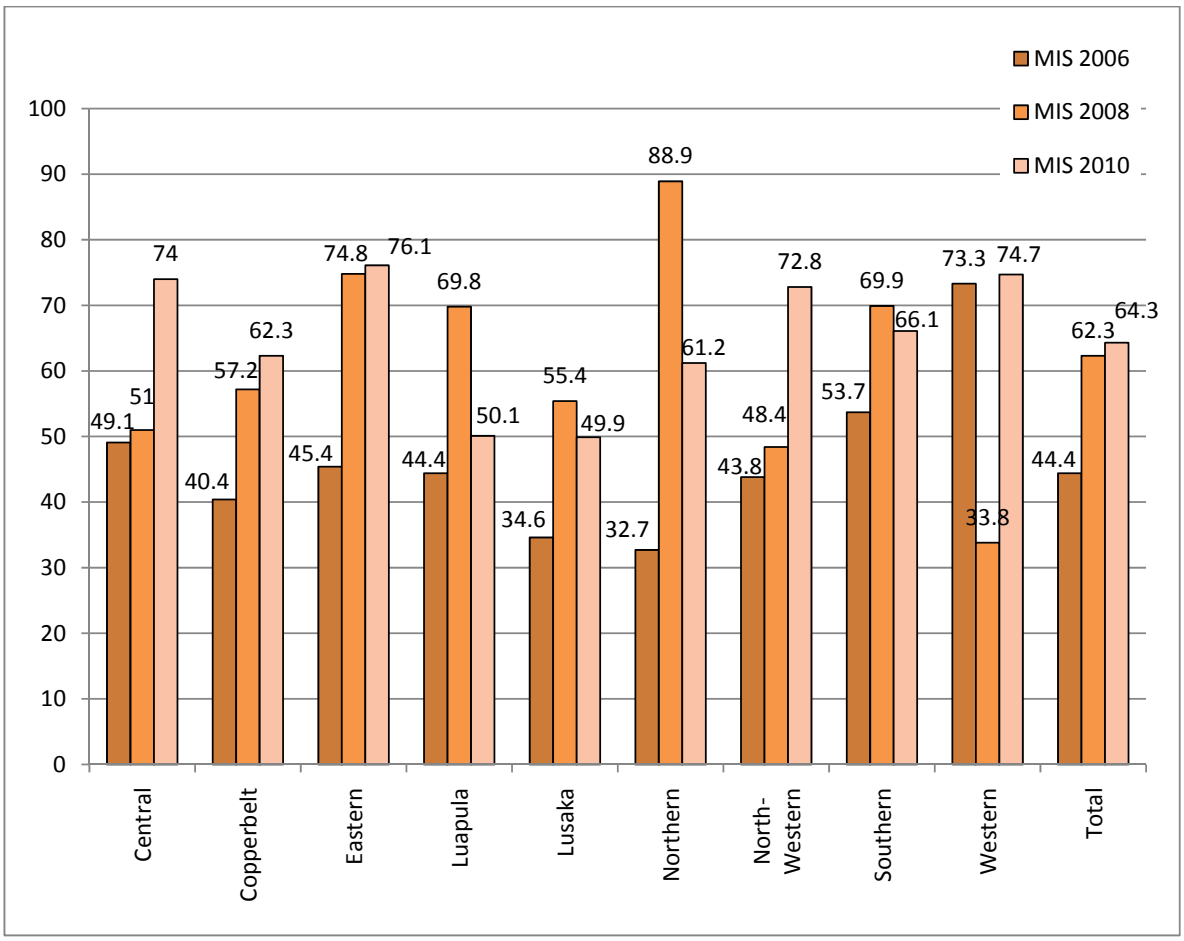
Whereas nationwide ITN ownership showed a major increase between 2006 and 2008, less progress was seen nationally between 2008 and 2010, although several provinces made substantial gains. Over sixty-four percent (64.3%) of households now report having at least one ITN, and 61.6% at least one long-lasting insecticide-treated net (**Figure 1**).

Figure 1: Net ownership of at least one ITN and use among children under age five years and pregnant women (Zambia, 2006, 2008, and 2010)



ITN ownership varies from province to province, as shown in **Figure 2**. All but two provinces have reached the Abuja target of 60% households owning at least one ITN. North-Western, Central, and Western provinces have shown the most substantial increase in ITN ownership since 2008, whereas Luapula and Northern provinces show the greatest decline.

Figure 2: Ownership of at least one ITN by province (Zambia, 2006, 2008, and 2010)



ITN use among the most vulnerable populations, children under five years of age and pregnant women, has consistently increased since 2006 (**Figure 1**). In 2010, almost half (49.9%) the children under five years of age had slept under an ITN the night preceding the survey, as had 45.9% of pregnant women.

IRS

Since 2005, IRS activities have been expanded from 15 to 36 districts. Nationally, IRS coverage rates increased from 9.5% in 2006 to 23.1% in 2010 (**Figure 3**). The biggest increase was observed in rural areas: initially targeted to peri-urban and urban areas, IRS reached almost 15% of rural households in 2010.

Figure 3: Percentage of households reached by IRS (Zambia, 2006, 2008, and 2010)

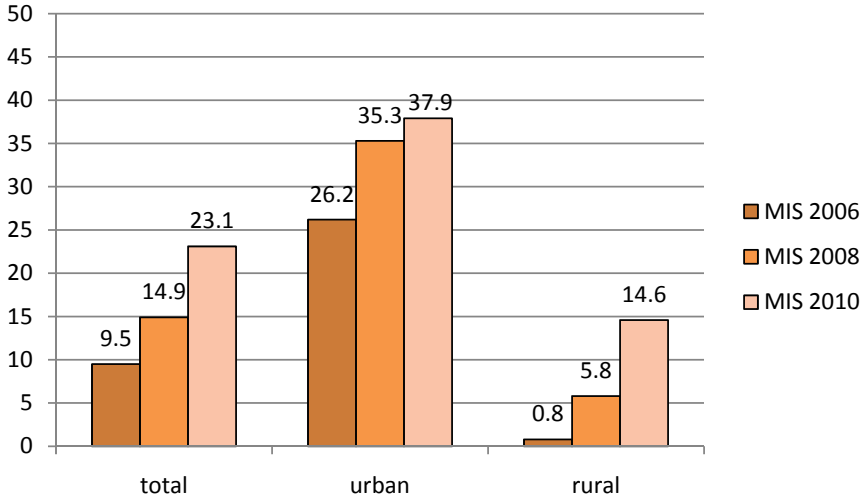
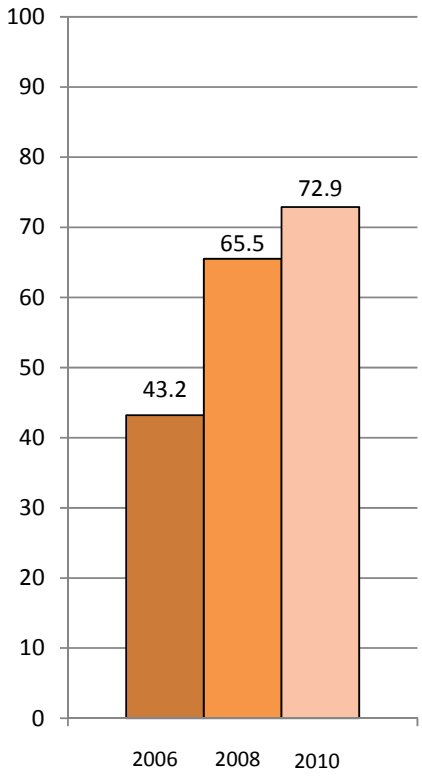


Figure 4: Percentage of households owning at least one ITN or reached by IRS (Zambia, 2006, 2008, and 2010)

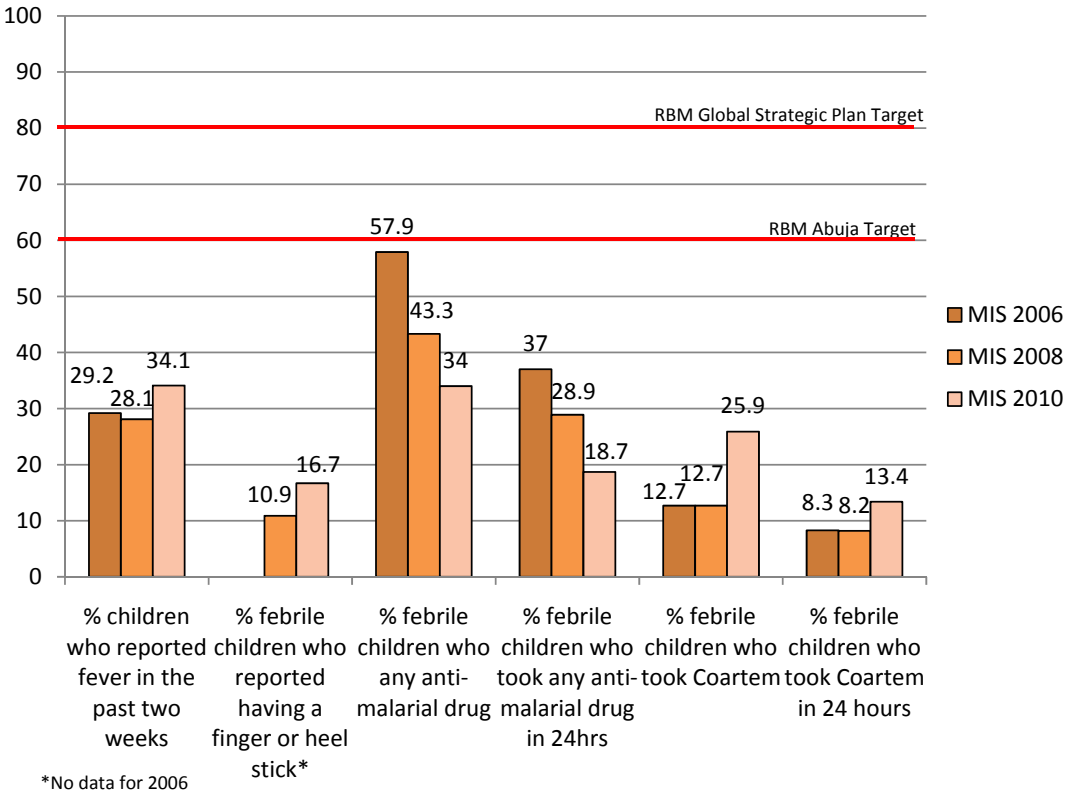


The combination of multiple prevention methods—ITNs and IRS—is an issue of interest for maximizing efficiencies and protection across sub-Saharan Africa. **Figure 4** shows the situation in Zambia, where the number of households owning at least one ITN or having been reached by IRS increased from 43.2% in 2006 to 72.9% in 2010. An increasing number of households were covered by both interventions (from 4.1% in 2006 to 14.5% in 2010, data not shown).

Prompt and effective case management

Figure 5 shows that, whereas the proportion of children reporting fever has remained almost constant since 2006, the number of febrile children having a heel or finger stick has increased by almost two-thirds since 2008. As malaria case definitions in facilities change to reflect the use of either RDTs or microscopy, one could expect the treatment patterns to alter with antimalarial drugs being prescribed less frequently for febrile illness not attributed to malaria. Overall, treatment with Coartem® as the antimalarial drug of choice among clinicians has improved greatly since 2008, with more febrile children receiving Coartem® than any other antimalarial drug (data not shown).

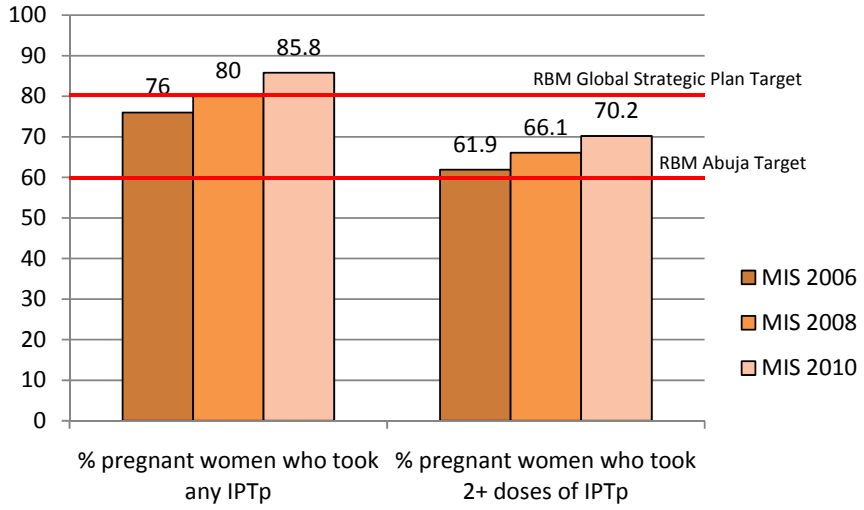
Figure 5: Prevalence and prompt treatment of children under five years of age (Zambia, 2006, 2008, and 2010)



IPT in pregnant women

Progress with IPT during pregnancy has been steady as antenatal attendance remains high throughout the country. Seventy percent of women interviewed reported receiving two doses of IPT during their most recent pregnancy (**Figure 6**).

Figure 6: Percentage of pregnant women who took IPT during pregnancy (Zambia, 2006, 2008, and 2010)

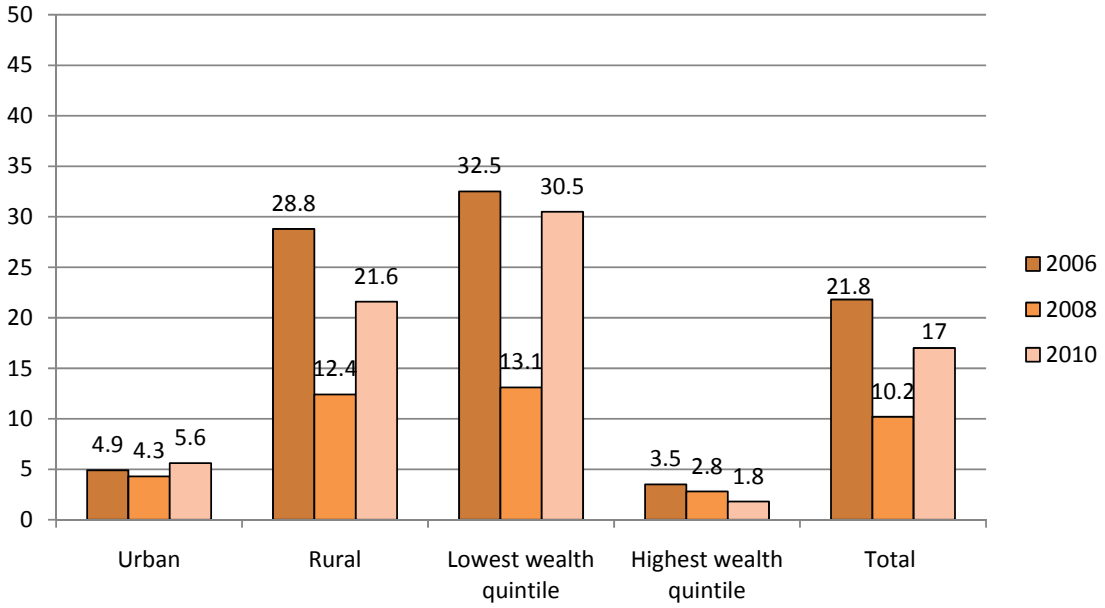


Malaria parasitaemia and severe anaemia

Parasitaemia

National malaria parasite prevalence has varied since the first MIS in 2006, from 21.8% to 10.2% to 16.0% in 2006, 2008, and 2010, respectively (**Figure 7**). It continues to be greater in rural areas, and is considerably higher in children under five years of age living in the poorest households.

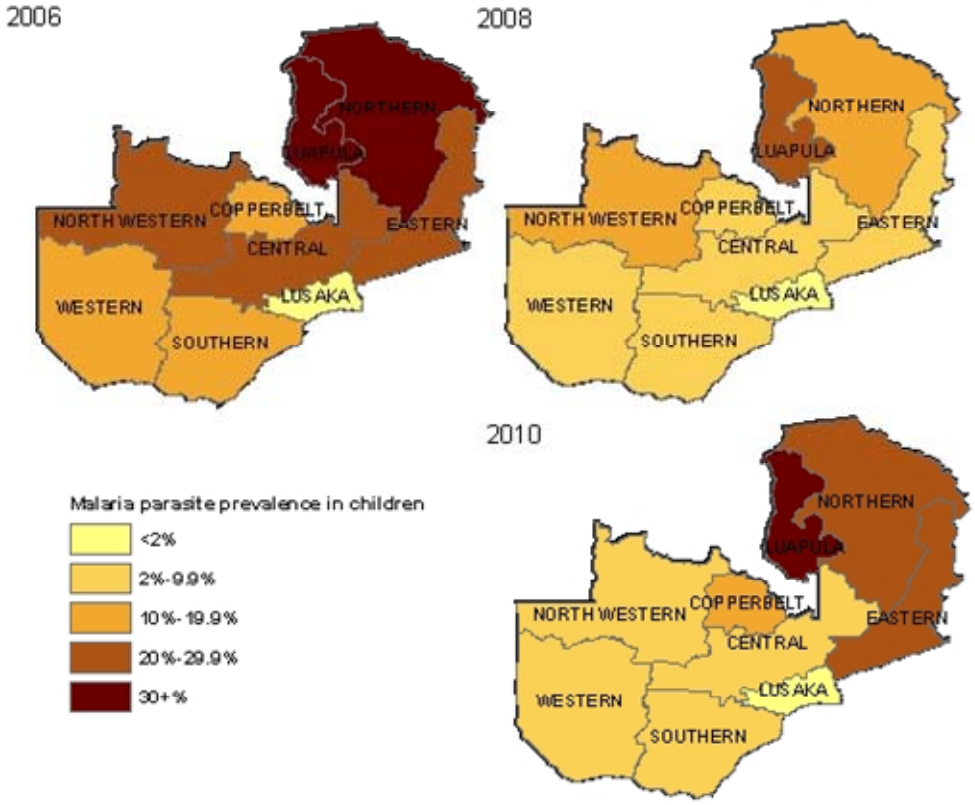
Figure 7: Malaria parasite prevalence by geographic residence and wealth quintile (Zambia, 2006, 2008, and 2010)



Eastern, Northern, and Luapula provinces, which all showed a decline in malaria parasitaemia in 2008 compared to 2006, show an increase in 2010 (**Figure 8**). In Luapula in particular, microscopy slides were positive for malaria in over 50% of tested children in 2010, compared to nearly 22% percent in 2008.

The increase in malaria parasitaemia in Northern and Luapula provinces is likely due to the steep decline in ITN ownership (**Figure 2**) and use (data not shown) in these provinces. Further, parasitaemia rates were likely affected by a decline in ITN efficacy over time, as Eastern, Northern, and Luapula provinces were not recently resupplied with large numbers of ITNs.

Figure 8: Malaria parasite prevalence by province (Zambia, 2006, 2008, and 2010)

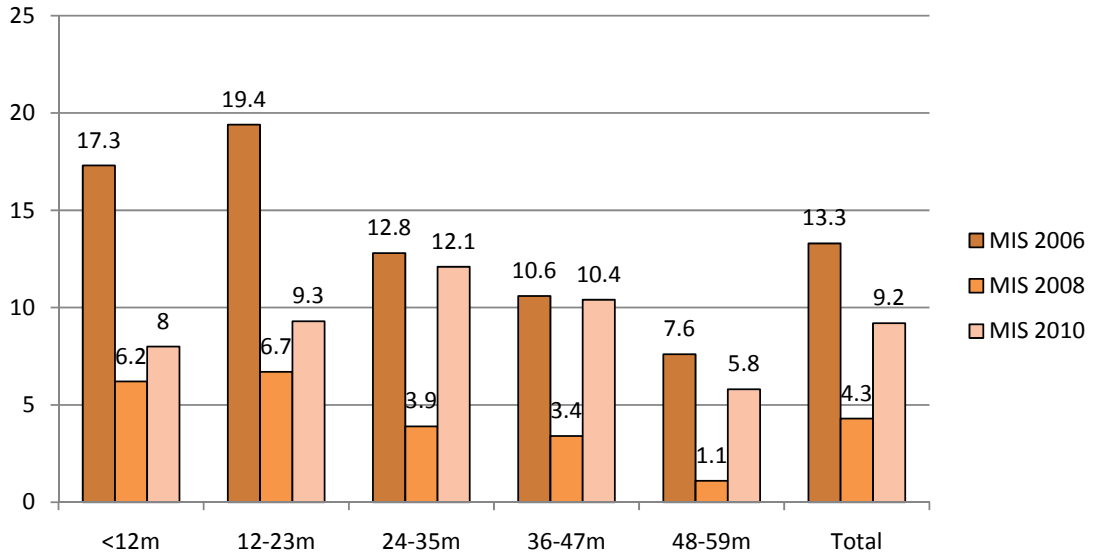


Severe anaemia

Severe anaemia is defined as haemoglobin levels less than 8 grams per decilitre. Nationwide, severe anaemia prevalence was 9.2% in 2010. It was found to be higher where there was high parasite prevalence (data not shown). As was the case with parasitaemia, severe anaemia was higher in children living in rural areas and in households from the lowest wealth quintile (data not shown).

In 2006, severe anaemia was higher in children under two years of age, but in 2010, it peaked in children aged 24 months (**Figure 9**). Across all three surveys, severe anaemia started to decline after age two. The increase in severe anaemia prevalence reported in 2010 was more substantial among older children than younger children.

Figure 9: Severe anaemia prevalence (Hb<8g/dL) by age (Zambia, 2006, 2008, and 2010)



Conclusions

The 2010 Zambia MIS shows that success is being maintained in many areas of the country.

- In 2010, 64% of households owned at least one ITN, compared to 62% in 2008. Among these households, 42% had members who slept under an ITN the previous night, compared to 34% in 2008; 50% of children under five years of age slept under an ITN the night before the survey, compared to 41% of these children in 2008; and 46% of pregnant women reported sleeping under an ITN the previous night, compared to 43% in 2008.
- Thirty-four percent of febrile children took an antimalarial medicine in 2010, compared to 43% in 2008; the percentage of febrile children who took Coartem® treatment, more than doubled, from 12% in 2008 to 26% in 2010.
- Seventy percent of pregnant women reported taking two doses of IPT during their last pregnancy, compared to 66% in 2008.
- Nationally, nearly a quarter of households in Zambia reported being sprayed, with a ten-fold increase having occurred since 2006 in rural areas.
- Seventy-three percent of households were covered by at least one ITN or recent IRS, compared to 68% in 2008.

However, new challenges have emerged, that may jeopardize the achieved progress if they are not addressed:

- In Northern and Luapula provinces, there were marked drops in household ownership of ITNs between 2008 and 2010 (31% and 29% reductions, respectively).
- In the same provinces, ITN use by children under five years of age the night before the survey decreased dramatically—dropping by 33% and 25%, respectively; in Luapula only 34% of children under five years of age slept under an ITN the previous night.

- In Northern and Luapula provinces, 2010 rates of malaria were 24% and 51%, respectively, and rates of severe anaemia were 11% and 21%, respectively, compared with 2008 malaria rates of 12% and 22%, respectively, and severe anaemia rates of 3% and 7%, respectively. Steep declines in ITN ownership and use likely can account for much of these increases.
- Eastern Province maintained ITN coverage from 2008 to 2010 but experienced resurgence in malaria during that interval (from 9% to 22%). Of note, Eastern Province had not received a substantial supply of replacement ITNs since 2007.

The MIS 2010 results illustrate the importance of sustaining malaria control efforts over time. While many areas of Zambia continued to show improvements both in delivery of malaria control services and in reducing malaria burden, sustained, large-scale provision of malaria prevention commodities, especially ITNs, are critical to achieving and maintaining high intervention coverage and reduced disease burden throughout the country. In at least three Zambian provinces, lack of ITN replacement hampered efforts to control malaria, and resulted in a considerable increase in parasitaemia and severe anaemia, in a relatively short time. This calls for continued focus on sustaining impact and requires strong commitment from all malaria control partners to ensure continued success.