ZAMBIA NATIONAL MALARIA INDICATOR SURVEY 2010

Government of the Republic of Zambia, Ministry of Health

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This report summarizes the findings of the 2010 Zambia National Malaria Indicator Survey carried out in April and May 2010 by the Ministry of Health, Central Statistical Office, Malaria Control and Evaluation Partnership in Africa (MACEPA, a programme at PATH), the United States President's Malaria Initiative, the World Bank, UNICEF, the World Health Organization, and the University of Zambia.

Contents

Acronyms

ANC	Antenatal clinic
ART-LUM	Artemether-lumefantrine
CDC	US Centers for Disease Control and Prevention
CSA	Census supervisory areas
CSO	Central Statistical Office
DHS	Demographic and health survey
HSSP	Health Services and Systems Program
IPT	Intermittent preventive treatment
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LLIN	Long-lasting insecticidal net
M&E	Monitoring and evaluation
MACEPA	Malaria Control and Evaluation Partnership in Africa
MERG	Monitoring and Evaluation Reference Group
MICS	Multiple indicator cluster survey
MIS	Malaria indicator survey
MOH	Ministry of Health
NMCC	National Malaria Control Centre
NMSP	National Malaria Strategic Plan
PATH	Program for Appropriate Technology in Health
PDA	Personal digital assistant
PMI	President's Malaria Initiative
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SEA	Standard enumeration areas
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
WBC	White blood cell
WHO	World Health Organization

Acknowledgments

This report presents the results of the Zambia National Malaria Indicator Survey 2010, a comprehensive, nationally representative household survey designed to measure progress toward achieving the goals and targets set forth in the National Malaria Strategic Plan 2006–2010. It represents the efforts of several agencies and many individuals. The Ministry of Health, namely the National Malaria Control Centre (NMCC), has the major responsibility for conducting the survey. Other agencies have been instrumental in this survey including the Central Statistical Office (CSO), the Malaria Control and Evaluation Partnership in Africa (MACEPA, a programme at PATH), the Health Services and Systems Program (HSSP), the US President's Malaria Initiative (PMI), the World Bank, the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), and the University of Zambia.

At the Ministry of Health, Kapembwa Simbao, Minister of Health, Dr Solomon Musonda, Deputy Minister, Dr Peter Mwaba, Permanent Secretary, and Dr Victor Mukonka, Director of Public Health and Research, provided overall survey leadership and guidance. At the National Malaria Control Centre, Dr Mulakwa Kamuliwo, Acting Deputy Director, Public Health and Research, Malaria; Moonga Hawela, Parasitologist; Mercy Mwanza, Surveillance and Information Officer; Chadwick Sikaala, IRS Technical Officer; Isaac Mwase, Community Malaria Booster Response M&E Officer; Busiku Hamainza, Operations Research Officer; Pauline K. Wamalume, Information Education Communication Specialist; and Peter Hibeene, Accountant, took primary responsibility for survey operations and coordination. Also within the Ministry of Health, various members assisted with organization, community sensitization efforts, logistics, ordering of supplies, and training. At CSO, Efreda Chulu, Director, and Batista Mwale, Survey Statistician, provided support for the sample design, sample selection, and analysis. CSO staff also provided support during the field work for identification of cluster boundaries and household listing. At MACEPA, John Miller, Boniface Mutombo wa Mutombo, Rick Steketee, Kafula Silumbe, Chris Lungu, Msanide Phiri, Mildred Banda, and Todd Jennings provided logistics support, survey organization, accounting, and support for design and analysis. Cristina Herdman, Manny Lewis, and Laura Newman edited and formatted the report. From PMI, Oliver Lulembo and Allen Craig of United States Agency for International Development and the United States Centers for Disease Control and Prevention (CDC) Zambia offices provided support for the design of the survey, Katherine Tan from CDC Atlanta reviewed the protocol, and Anatoly Frolov from CDC Atlanta took responsibility for development of the programming of the questionnaire and data tabulations. At the HSSP, Elijah Sinyinza, Brian Chirwa, Patrick Chewe, Dayton Makusa, and Moonje Shimukowa provided coordination during the survey planning process and technical support during training and field work. Dr. Aklilu Seyoum from the Malaria Transmission Consortium supported the training and field work. Fred Masaninga from WHO provided support for activities, training, and field work. Rodgers K. Mwale and James Simasiku from UNICEF provided technical guidance for protocol review (diagnosis and treatment algorithm) and assistance with community sensitization efforts. Professor Kumah Sridutt Baboo and the students from the Masters of Public Health Program, University of Zambia, provided support during training and field work. The Roll Back Malaria Monitoring and Evaluation Reference Group (RBM MERG) developed the questionnaire and survey instruments used. The training materials, methodology, and questionnaires used in the survey were mostly drawn from the work of the RBM MERG, but especially from the work of ORC Macro, which organizes the Demographic and Health Surveys (DHS).

A complete list of the field teams and individuals involved in the survey are presented in Appendix B.

Preface

Malaria control in Zambia is a priority of the Ministry of Health. Measurement of progress in malaria control is critical to the expeditious use of resources so that we know where we stand with respect to our targets and goals.

The Zambia National Malaria Indicator Survey 2010 represents the third large-scale effort to benchmark progress of malaria control efforts—interventions and disease burden--since the launch of the National Malaria Strategic Plan 2006–2010. Zambia is the only country to have conducted three such surveys.

We have made great progress and faced many challenges in our fight against malaria. Notably, we continue to make treated mosquito nets and indoor spraying available throughout the country. By enlisting community leaders as advocates, we are also winning the hearts and minds of our communities as they strive to use these interventions. This is evident in usage figures for mosquito nets and spraying, as well as preventive medicine for pregnant women and antimalarial treatment. We have gained substantial ground in making the nationally-recommended artemisinin-based combination therapy the most often used antimalarial drug.

Despite these successes, the malaria parasites and the mosquitoes that spread them continue to challenge us with their own will to survive. This demands that we continue our efforts to exploit their weaknesses and not look away, but stand firm and continue the assault in new and innovative ways.

We are winning this battle because of our commitment to an evidenced-based approach to malaria control and because of the continued support of our partners. As we continue to work together, rest assured that we will overcome the many challenges that confront us.

Dr. Peter Mwaba
Permanent Secretary
Ministry of Health

Executive Summary

The Ministry of Health through the National Malaria Control Programme has outlined an aggressive approach to reducing malaria and malaria-related burden through the massive scale-up of malaria control interventions. Evaluation of scale-up of key interventions is essential for understanding progress in the fight against malaria. Tremendous progress has been achieved throughout Zambia toward reaching national targets in malaria control since the national scale-up in 2006.

This report presents the results of the Zambia National Malaria Indicator Survey (MIS) 2010, a nationally representative household survey assessing coverage of key malaria interventions and malaria-related burden among children under age five years. The 2010 MIS report also compares results from previous surveys conducted in 2006 and 2008. The 2010 survey was developed and conducted by the Ministry of Health and several key malaria partners including the Central Statistical Office, the Malaria Control and Evaluation Partnership in Africa (MACEPA, a programme at PATH), the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the United States President's Malaria Initiative (PMI), the Health Services and Systems Program (HSSP), the World Bank, and the University of Zambia.

The MIS was based on a nationally representative two-stage cluster sample of 4500 households surveyed from 180 standard enumeration areas randomly selected from 66 of the 72 districts from all nine provinces to provide representative national and urban and rural estimates, as well as the 10 Roll Back Malaria (RBM) sentinel districts. Field work was conducted during April and May 2010 by 15 field teams using standardized questionnaires preprogrammed onto hand-held computers (called personal digital assistants or PDAs) to facilitate data entry, extraction, and analysis. Malaria parasite testing was done using ICT Malaria Pf® rapid diagnostic tests (RDTs) and both thick and thin blood smears. Anaemia testing was done using Hemocue® Hb 201 analysers and microcuvettes.

Insecticide-treated nets (ITNs) and indoor residual spraying (IRS) are the primary control strategies for preventing malaria transmission in Zambia. Results from the 2010 MIS indicate 70% of Zambian households have at least one mosquito net, and 64% of households have at least one ITN, representing an increase from 2006; substantial progress was made in replenishing ITNs in several provinces.

Fifty-five percent of all Zambian children under age five years slept under a mosquito net the night before the survey, an increase from 2008 despite challenges in increasing overall net availability. Ninety percent of children under age five years who slept under a net the night before the survey slept under a treated net. The number of districts included in the IRS programme increased from 15 to 36 since the 2008 survey, with additional districts planned for 2010. Nationally, in 2010, nearly a quarter of households in Zambia reported being sprayed, with a ten-fold increase having occurred in rural areas.

Malaria prevention in pregnancy continues to rely on the use of ITNs and the use of intermittent preventive treatment (IPT) during pregnancy. The night before the survey, 52% of all women ages 15 to 49 years slept under a mosquito net, and 47% slept under an ITN. More than half (52%) of all pregnant women reported sleeping under a mosquito net while 46% reported sleeping under ITNs. Eighty-nine percent of mothers reported taking an antimalarial drug for prevention during their last pregnancy, while 86% reported taking IPT at least once. The WHO-recommended two-treatment dose target was achieved by 70% of pregnant women during their last pregnancy.

Since 2004, the national first-line antimalarial treatment has been artemether-lumefantrine (ART-LUM). In the last two weeks before the survey, 34% of children had a fever, and among them, 34% took an antimalarial drug, and 19% took the drug within 24 hours of symptom onset. ART-LUM is the most common antimalarial drug given for fever. Twenty six percent of children with fever in the last two weeks were treated with ART-LUM, and only 4% with SP. Among children treated within 24 hours of symptom onset, 13% were given ART-LUM and 2% SP.

Malaria parasite prevalence was found to be 16%, and severe anaemia prevalence was found to be 9% among children under age five years. Malaria parasite prevalence levels were highest among children aged two to four while severe anaemia prevalence was found to be highest among children two years of age. Zambia continues to show progress in reducing parasitaemia since the start of the scale-up of interventions although three provinces were identified as showing increasing parasitaemia since 2008.

The MIS 2010 represents a significant milestone for benchmarking progress for the Zambian Ministry of Health and malaria control partners. The results of this survey will inform the health sector and malaria-specific strategic planning processes for the country in 2010 and 2011.

Chapter 1: Introduction

Malaria is endemic throughout Zambia and continues to be a major public health problem. Efforts to control malaria are currently being scaled up through coordinated effort among Roll Back Malaria (RBM) partners. In order to assess national scale-up efforts, effective monitoring and evaluation are needed to measure progress toward select targets and goals.

The Zambian Government has identified malaria control as one of its main public health priorities. This is emphasized in both the National Development Plan 2006–2011 and the National Health Strategic Plan 2005–2009. In this respect, the Government, through the National Malaria Control Centre (NMCC), has developed a detailed National Malaria Strategic Plan 2006–2010 (NMSP), aimed at significantly scaling up malaria control interventions towards the achievement of the national vision of "a malaria-free Zambia."

The Zambian Ministry of Health's (MOH) NMCC, in collaboration with multiple partners, set high targets for coverage of interventions and reductions in malaria burden outlined in the NMSP. Evidence of progress in rolling out malaria interventions to affected communities has come from several partners and sources including the 2001/2002 and 2007 national Demographic and Health Surveys (DHS), the 1999 UNICEF-supported Multiple Indicator Cluster Survey (MICS) and smaller-scale household surveys such as the RBM baseline and follow-up surveys (2001 and 2004), NetMark evaluation surveys (2000 and 2004), and others.

In 2006, the MOH and partners conducted the first nationally-representative Malaria Indicator Survey (MIS), measuring the coverage of the core RBM interventions and malaria-related disease burden. This was followed by a second MIS in 2008. These surveys were part of a planned, ongoing national evaluation of malaria control efforts implemented under the NMSP 2006–2010. The results of these surveys made it possible to monitor and evaluate progress on population-based coverage of key malaria interventions, including prompt effective case management, possession and use of insecticide-treated mosquito nets (ITNs), availability of indoor residual spraying (IRS), and intermittent preventive treatment (IPT) for pregnant women. Further, these surveys reported on the national prevalence of malaria parasitaemia (22% in 2006 and 10% in 2008) and severe anaemia (13% in 2006 to 4% in 2008) among children less than five years of age.

The 2006 and 2008 MISs were based on a standard set of instruments and a protocol developed through the RBM Monitoring and Evaluation Reference Group (MERG), a global technical advisory group providing M&E guidance for malaria control programmes. These tools were largely based on the collective experience of the DHS and MICS and are presented as a package of materials to promote standardized survey sampling methods, questionnaires, and results tabulations as well as to provide assistance with survey logistics, budgeting, and training of survey teams. The package includes standardized measurement of malaria parasite prevalence and anaemia among target populations to derive malaria-related burden at the community level. The RBM-MERG recommends that countries with endemic malaria transmission patterns, especially those in sub-Saharan Africa, conduct an MIS every two years within six weeks of the end of the rainy season. In Zambia, this corresponds to survey field work during the months of April and May.

Objectives

The goal of the 2010 Zambia MIS was to evaluate progress toward achieving the goals and targets set forth in the NMSP 2006–2010. The specific objectives of the Zambia national MIS 2010 were:

1. To collect up-to-date information, building on the experience of the MIS 2006 and 2008, on coverage of the core malaria interventions included in the NMSP 2006–2010.
2. To assess malaria parasite prevalence among children under age five years.
3. To assess the status of anaemia among the target populations (children ages 6 to 36 months).
4. To assess disparities in malaria intervention coverage, and malaria parasite and anaemia prevalence among the surveyed population by location and other background characteristics.
5. To implement standardized, representative household survey methods.
6. 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.

Sample design

The MIS 2010 covered household populations in Zambia. The design for the survey was a representative probability sample to produce estimates for the country as a whole, and for rural and urban populations separately.

Zambia is administratively divided into nine provinces and each province is in turn subdivided into districts. For statistical purposes, each district is subdivided into Census Supervisory Areas (CSAs) and these are in turn subdivided into Standard Enumeration Areas (SEAs). The 1998–2000 mapping exercise, conducted in preparation for the 2000 census of population and housing, demarcated the CSAs within wards, wards within constituencies, and constituencies within districts. In total, Zambia has 72 districts; 150 constituencies; 1,289 wards; about 4,400 CSAs; and about 17,000 SEAs. The listing of SEAs has information on the number of households and the population. The number of households will be used as a measure of size for selecting primary sampling units. Therefore, the sample frame of this survey was the list of SEAs developed from the 2000 Population Census.

Sample sizes were calculated with the assumption that future cross-sectional surveys will be conducted for comparison with these results. Sample size determination was based on an expected reduction in parasitaemia levels among rural populations from the 2008 MIS results and according to the MIS Sampling Guidelines documentation (RBM, 2005). The MIS conducted in Zambia in 2008 found a national prevalence rate of severe anaemia (measured as haemoglobin less than 8 g/dl) of 4.3% and a malaria parasite prevalence rate of 10.2% for children under age five years. For rural areas, the estimates were 4.3% and 12.4%, respectively. With an estimated 91% of households with at least one child under age five (and assuming 46% with a child aged 6 to 36 months), the sample size used for the MIS was determined using 95% confidence limits, 80% power, a design effect of 2.00, and 20% adjustment for non-response (from household refusals, or abandoned households). Based on these criteria, a 15% relative standard error requires at least 2,550 households in the rural domain.

The 2010 MIS added additional sampling for households which fell within targeted areas newly covered since 2008 by IRS activities. Including these additional households helped determine the extent to which IRS has benefited communities in Zambia through reductions in malaria burden.

In order to create a set of SEAs where IRS has occurred, the data set created from IRS enumeration activities was overlaid with the Census SEA boundary file. The IRS enumeration data set contains data from enumeration from 2007 to 2009 for 36 districts which were sprayed in 2009. Data from 2007 and 2008 were collected to represent areas where spraying was conducted by the district IRS team. In 2009, IRS enumeration activities

were expanded to include areas of spray districts which were deemed future areas for spraying. However, enumeration activities also recorded whether households reported having been sprayed with the previous 12 months, which would have reflected the extent of the 2008 IRS spray activities. Therefore, for enumeration activities conducted in 2009, the listing of households sprayed and thus SEAs included as IRS areas was corrected by reported spraying within the previous 12 months. Further, enumeration efforts for Lusaka District did not cover the full district. Lusaka was assumed to be fully covered by IRS activities, based on the reported operational spray coverage targets reached by the district, and all SEAs from Lusaka District were included in the set of IRS spray areas.

Figure 1 presents a map of all SEAs which were available from the combination of enumeration data and census boundary files at SEA level. Finally, this list of census boundary files was matched back to the master listing of census SEAs to arrive at the total possible number of SEAs to be included in the IRS sample. **Table 1** presents a summary of SEAs where IRS is occurring and from which an additional sample of houses assumed to be covered under IRS were drawn.

Figure 1: Census Standard Enumeration Areas with expected indoor residual spraying coverage (red areas=SEAs where IRS is conducted estimated for 2008–2009 period; black lines=district boundaries).

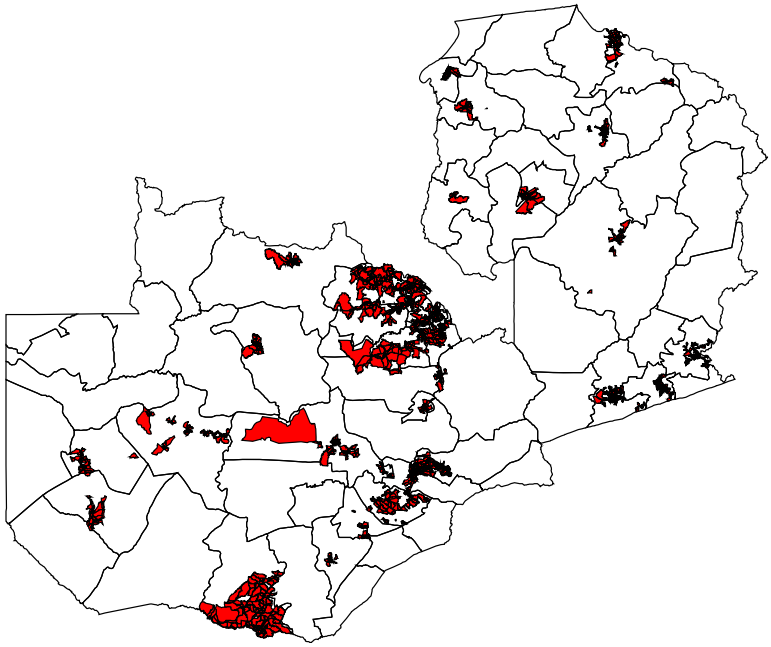


Table 1: Summary of SEAs by national, urban and rural, and province (Zambia 2010)

Group	Total IRS Census Boundary Listing, N	Matched Census Standard Enumeration Areas (SEAs) (%)
Rural	1,262	1,240 (30.6%)
Urban	2,836	2,808 (69.4%)
Total	4,098	4,048 (100%)

Further, IRS campaigns have been conducted annually in an increasing number of districts for several years. At the time of the 2006 and 2008 MISs, areas from 15 districts were covered under IRS activities. In late 2008, areas from 21 new districts were added to the annual IRS campaign, including an increase in areas defined as rural. For simplicity and to maximize the possibility of evaluating the contribution of IRS to the national control programme, oversampling among current IRS areas emphasized those areas which were newly sprayed since 2008 and those areas denoted as rural since the prevalence of malaria in rural areas was significantly greater. **Table 2** summarizes matched SEAs from districts which had already been sprayed by the 2006 and 2008 surveys and districts which were newly sprayed since the 2008 MIS. An IRS cluster was defined as a census SEA which had been enumerated by the national programme and where either the district IRS focal person confirmed spraying had been conducted or where a minimum threshold of houses within the cluster reported that they were sprayed in the previous 12 months.

Table 2: Among matched 4,048 SEAs where IRS activities are reported to have occurred, the distribution of SEAs by whether the district is newly sprayed since 2008 (Zambia 2010)

Geographic Residence	IRS clusters among districts *already* sprayed at the time of MIS 2008, N, (%)	IRS clusters among districts *newly* sprayed since MIS 2008 (%)
Rural	404	836
Urban	2,372	436
Total	2,776	1,272

Therefore, IRS oversampling was drawn from among the 836 clusters from rural areas in newly sprayed districts so that at least 800 total households (32 SEAs) would be included. The remaining allocation of MIS 2010 SEAs were assigned to an urban domain which accounted for an additional 61 clusters.

To achieve the sample's total household requirement of 4,500 households, 25 were selected from 180 SEAs. A first-stage selection of the SEAs was conducted by the CSO according to the specified domains. A second-stage sampling was conducted at the time of field work using personal digital assistants (PDAs). All households within a SEA were digitally listed using PDAs fitted with geo-positioning units and a random sample of 25 households per SEA was selected for interviewing from all households listed. Every attempt was made to conduct interviews in the 25 selected households and, if any eligible interviewee was absent up to three visits were made to complete the interview. This was done to minimize potential bias from non-response.

Questionnaires

Two questionnaires were used for the Zambia MIS 2010: the household questionnaire and the women's questionnaire. The content of each was based on model questionnaires developed by the MEASURE DHS+ programme and adopted and recommended for use by the RBM MERG Task Force on Household Surveys.

The household questionnaire was used to list all usual members and visitors of the selected households. Some basic characteristics of each person were collected including his or her age, sex, education, and relationship to the head of the household. The main purpose of the household questionnaire was to identify women who were eligible to answer the individual questionnaire (all women 15 to 49 years of age were eligible). Malaria-specific issues covered in the household questionnaire included:

- Fever prevalence and treatment-seeking behaviour for all household members.
- IRS.
- ITNs, including household possession, net treatment status, and use of nets among all household members.

The women's questionnaire was used to collect information from all women aged 15 to 49. The following topics are included:

- Background characteristics (e.g., education level, asset-based wealth index).
- Reproductive and birth history, pregnancy status.
- General malaria knowledge.
- IPT for pregnant women.
- Fever prevalence among children under five years of age and fever treatment with antimalarial drugs.

Questionnaires were programmed into PDAs to eliminate the need for paper transcribing, to allow quicker data tabulation, and to facilitate faster interviewing from available skip patterns. For the purposes of the household listing each individual was assigned a unique identification code at the time of questionnaire administration.

Malaria parasite and anaemia testing

All health professionals recruited from the MOH received standardized training to conduct finger pricks for anaemia and malaria parasitaemia testing among children under six years of age in every household sampled. Sampling in children under age six years ensured that all children under age five years, the target population, were captured. Every effort was made to prevent secondary infection from the finger stick by using new disposable lancets for each child and by cleaning the finger with an alcohol swab. Field teams were provided with sufficient supplies for this throughout the field work. In addition, the field staff were provided with a fresh pair of latex gloves for each child receiving a finger stick. The purpose of the MIS was explained and if parental consent was given, a finger prick was conducted. The first drop of blood was wiped from the finger, the second drop was used to prepare a thick blood smear, the third drop was used in the HemoCue® photometer to determine the child's haemoglobin level, and the fourth drop was applied to a rapid diagnostic test (RDT). A final drop was placed on a filter paper for later molecular confirmation of diagnosis and parasite species if needed.

Results from the anaemia testing and RDTs were available immediately to the parents or caregivers of the child. Thick blood smears were fixed after drying and the blood smears were stained with Giemsa stain. All stained slides were read by two independent microscopists masked from RDT results. Slides with discrepant reader results or with discrepant RDT results were reanalysed by a third microscopist for final validation.

Diagnosis and treatment algorithm

Zambia's NMCC has a policy of expanding the use of RDTs for malaria diagnosis in conjunction with the use of Coartem® (a fixed dose combination of artemether 20mg and lumefantrine 120mg) for primary treatment of malaria in those with a positive RDT result; the Zambian-approved ICT Malaria Pf RDT was used to guide treatment of parasitaemic children during the survey.

Haemoglobin results were shared with the parent/guardian. If a child had a haemoglobin level of less than 7g/dl and a negative RDT, the parent/guardian was given written results, and the child was given an appropriate two-week dosage of daily iron and folate and chewable mebendazole and referred to a health centre. Medendazole is given as a presumptive treatment of helminthic infections and is only given to children at least 12 months of age as per the Integrated Management of Childhood Illnesses (IMCI). Children with a positive RDT result and clinically not fitting into the severe malaria classification

(severe anaemia, prostration, impaired consciousness, respiratory distress, convulsions, circulatory collapse, abnormal bleeding, jaundice, and passing black/brown [dark] urine) received immediate treatment for malaria using Coartem®, an artemisinin-containing combination antimalarial treatment, according to Zambia national treatment guidelines. Treatment was administered by the MOH nurses who were members of each field team. Further, children with a positive RDT result and classified as having simple malaria with mild to moderate anaemia (Hb between 8–11.5 g/dL) were treated with Coartem® and given a two-week course of folic acid ONLY and no ferrous sulphate. Children clinically assessed by the survey nurse as having severe malaria were transported immediately to the nearest health centre. Children already treated with Coartem® within the past two weeks were referred to the nearest facility for additional evaluation. Children who were found to be seriously ill, as determined by the survey nurses, were provided transportation to the nearest health facility.

HemoCue® and RDT testing were done according to manufacturer recommendations. Blood smears were stained with Giemsa stain prepared in advance of the field work by the NMCC. Parasite densities were calculated by counting the number of asexual stage parasites per 200+ white blood cells (WBCs) and assuming 8000 WBCs per decilitre of blood. Where there were fewer than 10 parasites per 100 fields, the slides were read up to a threshold of 500+ WBCs. Blood smears were considered negative if no parasites were found after counting 200 fields.

Personal digital assistants

PDAs were used for the second-stage sampling and recording of questionnaires and for malaria parasite and anaemia testing results. Two types of PDAs were used: Dell Axim X51 and HP iPAQ 459Xs. Programming of the questionnaire was done for the Windows Mobile 5.0 operating system using Visual Basic and SQL Mobile by the US Centers for Disease Control and Prevention (CDC), Atlanta, USA. A further programme was used for second-stage household sampling and included a navigation component to facilitate field staff returning to selected households for interviewing.

Community sensitization

To prepare surveyed communities for impending field work including a finger stick for anaemia and parasite testing, a series of community sensitization measures were undertaken. These included a general informational letter and accompanying flyer distributed to districts and local communities. These documents included information about the purpose, the procedures, and the importance of household participation. Further, a series of radio spots was developed in seven local languages and aired on both national and local community radio stations with service areas matching the selected SEAs. The radio spot contained a 45-second message from the MOH introducing the survey, the importance of doing finger sticks to determine parasitaemia and anaemia among children, and encouraging participation.

Training, pretest activities, and field work

Data collection for the MIS took place in April and May 2010. Fifteen interviewing teams carried out the field work. Each team included at least two health professionals and two lab technicians. Health professionals were selected by district health management teams from districts represented within the sampling frame, with the intent of having field staff from within, or close to, selected EAs. These health professionals, primarily female registered nurses, were responsible for conducting household interviews. Additional health professionals were selected from the Masters of Public Health programme of the University of Zambia to complement field staff needs. Teams were assigned to each of the nine

provinces with an additional team allocated for working among provinces as the selection determined.

Training was conducted in Lusaka during the last two weeks of March 2010. The training was coordinated by NMCC, MACEPA, WHO, and other partners as appropriate. The training schedule included sessions on survey background, questioning methods, the questionnaire, testing procedures, and the second-stage cluster-level sampling of households. PDAs were introduced to the field staff on the first day of training and used through all the training sessions to familiarize participants with each procedure. Central and Provincial Statistical Officers were called upon to provide support in identifying local cluster boundaries.

A field pretest of all survey procedures was conducted at the end of the training week in a set of clusters near the training centre. All participants in the training exercise were pre-arranged into groups corresponding to their field work assignments. During the pretest, full enumeration areas (SEAs not otherwise included in the survey sample) were listed and interviewed. Each team practiced performing the household listing, joining listed households from several PDAs into one PDA, and conducting interviews and testing procedures.

Ethical approval

Individual consent was obtained before the household and women's questionnaires and blood draws. The attached questionnaire and consent forms were used to obtain consent. The attached consent form was previously used in the MIS 2008.

The Research Ethics Committees of the University of Zambia, on behalf of the MOH in Zambia, PATH, and the CDC reviewed and approved the protocol.

Chapter 2: Characteristics of households and women respondents

Characteristics of households

The Zambia MIS 2010 collected data on basic demographic and socioeconomic characteristics of the population in the sampled households as well as information on housing facilities and conditions. This information was used in constructing an asset-based wealth index for interpretation of survey results. The criteria used to form the wealth index were based on work done previously by the World Bank and ORC Macro through the MEASURE DHS project.

For this survey, a household was defined as a person or group of persons, related or unrelated, who live together in the same dwelling unit (under one household head) and share a common source of food. The household questionnaire collected information on all usual residents and visitors who spent the night preceding the survey in the household.

Table 3 presents the de facto household population by five-year age groups according to gender and residence. The data show that there are slightly more women in Zambia than men, comprising 51.3% and 48.7% of the population, respectively. The population under age 15 years makes up about 47.5% of the total population. One important finding is the gap between the percentage of males and females at the 20–24 and the 25–29 age groups (**Figure 2**), especially in urban areas. The gap indicates there are more women than men in both of these age groups.

Table 3. Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to gender and residence (Zambia 2010)

	Urban			Rural			Total		
Age	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0–4	17.6	15.7	16.6	22.6	21.5	22.0	20.7	19.3	20.0
5–9	13.6	12.4	12.9	16.9	14.9	15.9	15.6	13.9	14.8
10–14	11.2	13.2	12.2	12.7	13.3	13.0	12.1	13.3	12.7
15–19	11.3	11.9	11.6	8.4	8.1	8.3	9.5	9.6	9.6
20–24	8.5	9.9	9.2	6.5	7.8	7.2	7.3	8.6	7.9
25–29	8.0	10.5	9.3	6.3	7.8	7.1	6.9	8.8	7.9
30–34	8.4	7.4	7.9	5.8	6.2	6.0	6.8	6.6	6.7
35–39	6.9	4.9	5.9	5.3	4.5	4.9	5.9	4.7	5.3
40–44	4.1	3.3	3.7	4.2	3.4	3.7	4.2	3.3	3.7
45–49	3.1	3.0	3.1	2.8	2.7	2.8	2.9	2.8	2.9
50–54	2.3	2.5	2.4	2.4	2.8	2.6	2.4	2.7	2.5
55–59	1.6	2.0	1.8	1.8	1.6	1.7	1.7	1.8	1.7
60–64	1.5	1.3	1.4	1.4	1.9	1.6	1.5	1.7	1.6
65–69	0.7	0.7	0.7	0.9	1.2	1.1	0.8	1.0	0.9
70–74	0.5	0.6	0.5	0.9	1.1	1.0	0.7	0.9	0.8
75–79	0.5	0.4	0.5	0.6	0.8	0.7	0.6	0.7	0.6
80+	0.2	0.3	0.3	0.5	0.4	0.4	0.4	0.3	0.4

continued

Table 3. Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to gender and residence (Zambia 2010)

	Urban			Rural			Total		
Age	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	3,720	3,893	7,612	6,034	6,396	12,430	9,753	10,289	20,042

Figure 2: Age pyramid of MIS-sampled population (Zambia 2010).

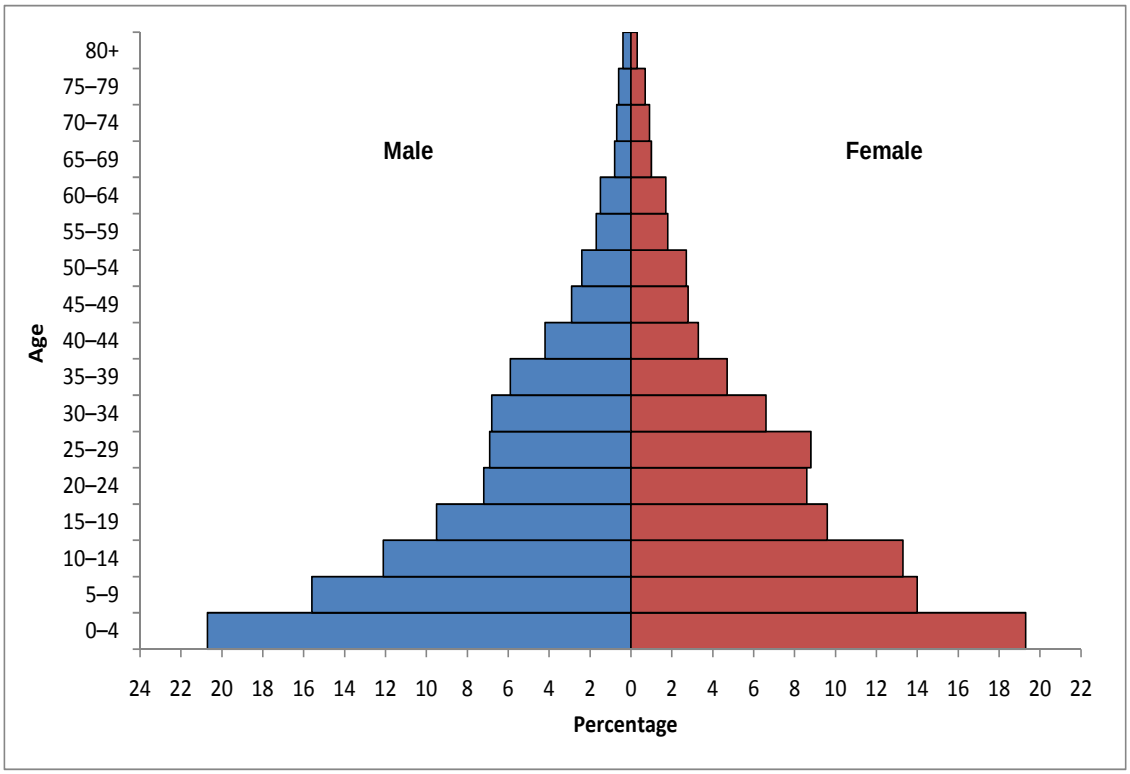


Table 4 presents the household composition among those surveyed. The percent of households headed by men was similar for both rural and urban areas. In the distribution of the number of usual household members, rural and urban areas are also very similar, except for households with one or two members.

Table 4. Household composition
Percent distribution by sex of head of household and by household size, according to residence (Zambia 2010)

	Residence		
Characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Sex of head of household			
Male	75.5	74.1	74.6
Female	24.5	25.9	25.4
Number of usual members			
1	7.4	10.0	9.1
2	9.8	12.8	11.7
3	15.2	14.3	14.7
4	17.4	17.0	17.2
5	17.2	14.7	15.6
6	11.4	12.0	11.7
7	9.1	8.2	8.5
8	5.2	5.2	5.2
9+	7.3	5.8	6.3
Total	100.0	100.0	100.0
Number	1,595	2,766	4,361

Table 5 shows that just over half (51.4%) of urban households reported having electricity, compared to 4.68% of rural households. Nationally, the most common sources of drinking water were unprotected wells (21.8%), tube wells or boreholes (18.1%), and water piped into the yard or plot (13.6%). In rural areas, the most common sources of drinking water were unprotected wells (31.5%) and tube wells or boreholes (25.1%), while urban households mostly reported using water sources piped into yard or plot (33.9%), public taps or stand pipes (29.6%), or water piped into the dwelling (14.2%). The most common toilet facilities reported in households were open pits or pit latrines without slabs (35.2%) or no facilities (27.2%). The vast majority of both urban and rural households surveyed had earth, sand, or dung floors (59.1%) or cement floors (37.2%).

Table 5. Household characteristics
Percent distribution of households by household characteristics, according to residence (Zambia 2010)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Electricity			
Yes	51.4	4.8	21.8
No	48.6	95.2	78.2
Source of drinking water			
Piped into dwelling	14.2	1.2	5.9
Piped into yard/plot	33.9	1.9	13.6
Public tap/standpipe	29.6	3.2	12.9
Tube well or borehole	5.9	25.1	18.1
Protected well	8.3	13.4	11.5
Unprotected well	5.0	31.5	21.8
Protected spring	0.1	1.3	0.8
Unprotected spring	0.2	7.4	4.8
Rainwater	0.0	0.0	0.0
Surface water (river/dam/lake/spring/pond)	1.8	14.8	10.0
Bottled water	0.1	0.0	0.1
Other	0.9	0.2	0.5
Sanitation facilities			
Flushed to pipe sewer system	28.7	1.6	11.5
Flushed to septic tank	4.4	0.7	2.0
Flushed to pit latrine	0.8	0.1	0.3
Flushed to somewhere else	0.4	0.1	0.2
Ventilated improved pit latrine	1.0	0.7	0.8
Pit latrine with slab	29.3	17.0	21.5
Pit latrine without slab/open pit	31.4	37.3	35.2
Hanging toilet/hanging latrine	0.0	0.3	0.2
No facility/bush/field	3.4	41.0	27.2
Other	0.8	1.2	1.1
Flooring material			
Earth/sand/dung	15.8	84.1	59.1
Wood planks	0.0	0.1	0.0
Parquet or polished wood	0.0	0.0	0.0
Vinyl or asphalt strips	0.1	0.0	0.0

continued

Table 5. Household characteristics
Percent distribution of households by household characteristics, according to residence (Zambia 2010)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Flooring material (continued)			
Ceramic tiles	4.1	0.1	1.6
Cement	75.8	14.9	37.2
Carpet	1.6	0.1	0.6
Other	2.6	0.7	1.5
Total	100.0	100.0	100.0
Number	1,595	2,766	4,361

Table 6 shows that just over half of Zambian households (53.4%) possess a radio. Over forty percent (42.3%) of households have either a landline telephone or a cell phone, with over two-thirds (67.8%) of houses in urban areas possessing either a landline telephone or a cell phone.

Table 6. Household durable goods
Percent of households possessing various durable consumer goods, by residence (Zambia 2010)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Radio	67.5	45.2	53.4
Television	57.2	10.2	27.4
Telephone or cell phone	67.8	27.6	42.3
Refrigerator	36.5	3.3	15.4
Bicycle	24.1	43.0	36.1
Motorcycle	1.0	0.9	0.9
Car/truck	4.3	0.6	2.0
None of the above	14.9	35.0	27.6
Number	1,595	2,766	4,361

Characteristics of women respondents

Eligible women ages 15 to 49 years were interviewed using the women's questionnaire. **Table 7** shows that nearly two-thirds (60.6%) of women were ages 15 to 29 years, and the majority of them lived in rural areas (58.8%). Over one-half of women reported less than a secondary level education (57.5%). The women surveyed were mainly Protestants (54.0%) or Catholics (20.9%), and women most often cited belonging to either the Bemba (31.8%) or the Nyanja or Tonga (14.0% and 14.4%, respectively) ethnic groups.

Table 7. Background characteristics of women respondents
Distribution of women ages 15 to 49 years by background characteristics (Zambia 2010)

Characteristic	Percent	Number
	(1)	(2)
Age		
15–19	20.4	817
20–24	19.7	788
25–29	20.6	825
30–34	15.1	606
35–39	10.3	415
40–44	7.6	305
45–49	6.3	253
Residence		
Rural	58.8	2,357
Urban	41.2	1,651
Province		
Central	10.0	403
Copperbelt	19.2	771
Eastern	12.4	499
Luapula	8.0	319
Lusaka	14.2	568
Northern	11.6	464
North-Western	5.4	215
Southern	12.9	517
Western	6.3	253
Education		
No education	9.8	495
Primary	46.6	1,869
Secondary	39.3	1,574
Higher	4.3	171
Religion		
Catholic	20.9	836
Protestant	54.0	2,166
Muslim	0.2	8

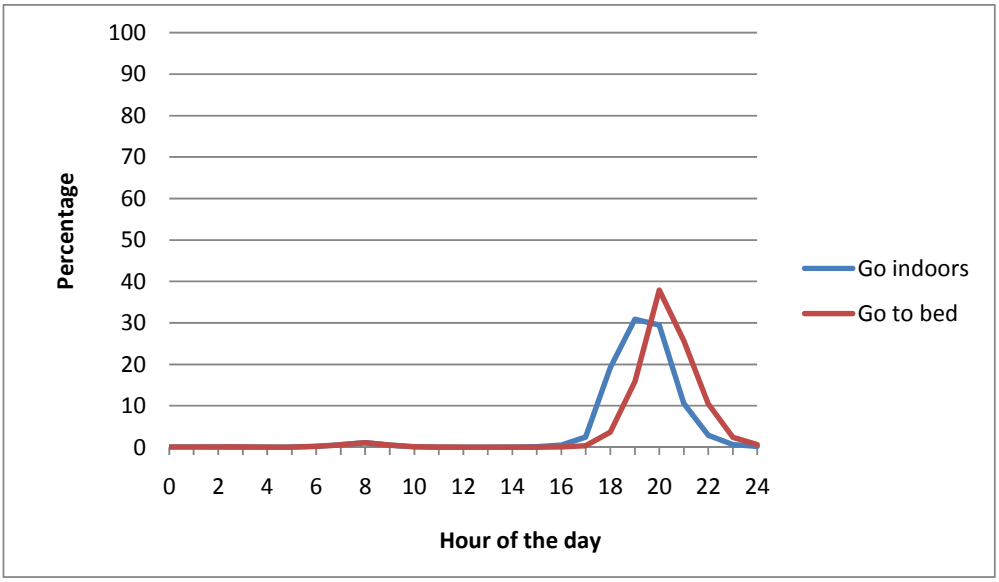
continued

Table 7. Background characteristics of women respondents Distribution of women ages 15 to 49 years by background characteristics (Zambia 2010)		
Characteristic	**Percent**	**Number**
	(1)	(2)
Religion (continued)		
Traditional	0.6	26
Other	24.3	973
Ethnic group		
Bemba	31.8	1,275
Tonga	14.4	576
North-Western	9.3	371
Baroste	6.3	253
Nyanja	14.0	562
Mambwe	2.6	104
Tumbuka	4.6	184
Other	17.0	683
Total	100.0	4,009

Additional population characteristics

Among household populations, reported time of going indoors and then going to bed are shown in **Figure 3**. This information can be important for determining relative exposure to mosquitoes since many malaria species bite during the evening or night. The peak time for going to bed was reported to be between 19 and 21 hours, thus indicating the likely time after which respondents became protected from mosquito bites.

Figure 3: Percentage of all household population reported time for going indoors and to going to bed (Zambia 2010).



Chapter 3: Coverage of key malaria interventions

Malaria control efforts in Zambia are focused around selected interventions. These include providing prompt, effective treatment with artemether-lumefantrine (ART-LUM) within 24 hours of symptom onset. Malaria transmission is prevented through two primary means: 1) the use of ITNs, targeted primarily in rural areas, and 2) IRS, targeted primarily in urban or peri-urban areas in 36 districts during 2008–2009 (up from 15 during 2005–2007). These efforts are complemented by specific interventions for pregnant women—namely provision of ITNs at no cost to beneficiaries at antenatal clinics (ANCs) and provision of IPT with sulfadoxine-pyrimethamine (SP).

Ownership of mosquito nets and ITNs

The national vision for ITNs distribution is to have universal coverage when sufficient funds are available. In Zambia, universal coverage is defined as ensuring that all sleeping spaces in all households are covered by an ITN. In order to achieve high coverage various delivery methods have been adopted. These include mass distribution campaign, malaria in pregnancy, equity which targets vulnerable groups (orphans, aged, chronically ill), Community Malaria Booster Response, Malaria School Health Programme and commercial market distribution for sustainability. The mass distribution campaigns have been implemented since late 2005 with expected replacements after three years of use. These campaigns have been conducted in all districts in six provinces (Western, North-Western, Northern, Luapula, Eastern, and Southern provinces) and in some districts in three provinces (Central, Copperbelt, and Lusaka).

The ownership and use of mosquito nets, whether insecticide-treated or untreated,[1] is the primary prevention strategy for reducing malaria transmission in areas of Zambia where IRS is not targeted. **Table 8** shows that 70.4% of households in Zambia had a mosquito net, with 66.9% of households having a net that had been treated with insecticide at some time. More importantly, 64.3% of households had an ITN and 32.5% had more than one ITN. The average number of ITNs per household was 1.16. Ownership of nets (all categories) was typically higher in rural than urban areas. For example, average number of ITNs per household was 1.04 for urban compared to 1.23 in rural areas. In Western Province, 85.3% of households reported having at least one mosquito net, and 74.7% of households reported owning at least one ITN. This is the highest percentage of mosquito net and ITN ownership reported among the nine provinces, owing partly to recent distribution efforts targeting Western, Southern, and North-Western provinces toward the end of 2009 and early 2010. Luapula, Lusaka, and Northern provinces reported the lowest household ownership of at least one mosquito net (57.0%, 54.9%, and 62.4%, respectively).

In terms of wealth index for ownership of ITNs for households with at least one ITN, the disparity between the lowest quintile compared to the highest quintile was only 5.1%. In the 2008 survey the difference between the lowest and highest quintile was similarly low at 3%. These findings could be attributed to the national free mass distribution campaigns of ITNs.

Between 2008 and 2010 the percentage of households that have at least one ITN increased from 62.3% to 64.3%. The change in overall ITN coverage has been minimal due low levels of ITN distributions in 2009 as a result of late disbursement of funds.

[1] An insecticide-treated net (ITN) is 1) a factory-treated net that does not require any treatment, 2) a pretreated net obtained within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months

Table 8. Ownership of mosquito nets
Households with at least one and more than one mosquito net (treated or untreated), ever-treated mosquito net, and insecticide-treated net (ITN), and average number of nets by each type per household, by background characteristics (Zambia 2010)

Background characteristic	Percentage of households that have at least one net	Percentage of households that have more than one net	Average number of nets per household	Percentage of households that have at least one ever-treated net	Percentage of households that have more than one ever-treated net	Average number of ever-treated nets per household	Percentage of households that have at least one ITN[1]	Percentage of households that have more than one ITN	Average number of ITNs per household	Number of households
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Residence										
Urban	62.1	32.1	1.16	59.4	36.6	1.10	56.9	28.5	1.04	1,595
Rural	75.2	40.1	1.39	71.3	30.4	1.29	68.5	34.8	1.23	2,766
Province										
Central	79.2	44.6	1.53	74.7	40.8	1.43	74.0	39.1	1.39	438
Copperbelt	65.9	33.5	1.19	64.3	32.4	1.15	62.3	31.2	1.11	676
Eastern	79.7	43.5	1.48	77.9	42.7	1.44	76.1	40.7	1.37	584
Luapula	57.0	22.9	0.87	55.5	20.9	0.84	50.1	17.0	0.73	363
Lusaka	54.9	26.1	0.96	52.3	24.2	0.90	49.9	22.4	0.85	640
Northern	62.4	33.2	1.14	62.0	32.7	1.12	61.2	32.2	1.11	572
North-Western	80.2	48.1	1.71	74.4	45.8	1.61	72.8	45.0	1.58	226
Southern	82.0	46.6	1.63	70.7	37.0	1.32	66.1	35.0	1.23	548
Western	85.3	45.1	1.62	81.5	40.2	1.49	74.7	36.1	1.33	315

continued

Table 8. Ownership of mosquito nets
Households with at least one and more than one mosquito net (treated or untreated), ever-treated mosquito net, and insecticide-treated net (ITN), and average number of nets by each type per household, by background characteristics (Zambia 2010)

Background characteristic	Percentage of households that have at least one net	Percentage of households that have more than one net	Average number of nets per household	Percentage of households that have at least one ever-treated net	Percentage of households that have more than one ever-treated net	Average number of ever-treated nets per household	Percentage of households that have at least one ITN[1]	Percentage of households that have more than one ITN	Average number of ITNs per household	Number of households
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Wealth index										
Lowest	67.6	33.2	1.19	63.1	29.8	1.08	60.2	28.6	1.03	859
Second	67.7	29.1	1.08	64.5	26.3	1.01	62.9	24.8	0.97	847
Middle	71.6	36.0	1.28	68.0	33.3	1.19	65.0	31.7	1.13	868
Fourth	73.0	40.8	1.39	70.0	38.1	1.31	67.6	35.8	1.24	907
Highest	71.9	46.3	1.59	68.9	43.8	1.50	65.3	41.0	1.41	879
Total	70.4	37.2	1.31	66.9	34.3	1.22	64.3	32.5	1.16	4,361

[1] An insecticide-treated net (ITN) is 1) a factory-treated net that does not require any treatment, 2) a pretreated net obtained within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months.

Table 9 presents the household level possession of long-lasting insecticidal nets (LLINs) that were distributed through mass distribution, ANCs in the Malaria in Pregnancy programme, or purchased through commercial sector. Of the available nets in households, most of the ITNs were LLINs across all areas and provinces**.**

Table 9. Household possession of LLINs
Percentage of households with at least one and more than one LLIN, and average number of LLINs per household, by background characteristics (Zambia 2010)

Background characteristic	Percentage of households that have at least one LLIN[1]	Percentage of households that have more than one LLIN	Average number of LLINs per household	Number of households
	(1)	(2)	(3)	(4)
Residence				
Urban	54.7	26.5	0.99	1,595
Rural	65.6	32.7	1.17	2,766
Province				
Central	58.0	30.1	1.12	438
Copperbelt	61.5	30.6	1.09	676
Eastern	74.8	38.5	1.33	584
Luapula	48.5	16.5	0.71	363
Lusaka	49.4	21.8	0.84	640
Northern	61.0	32.0	1.10	572
North-Western	72.8	45.0	1.58	226
Southern	64.0	32.2	1.16	548
Western	71.4	32.6	1.23	315
Wealth index				
Lowest	58.2	27.0	0.99	859
Second	59.4	22.2	0.90	847
Middle	61.9	29.4	1.07	868
Fourth	65.2	33.5	1.18	907
Highest	63.1	40.0	1.37	879
Total	61.6	30.4	1.10	4,361

[1]A long-lasting insecticidal net (LLIN) is a factory-manufactured net that does not require any treatment.

Use of mosquito nets and insecticide-treated nets by children and pregnant women

In malaria-endemic areas, studies have shown that the use of ITNs, especially among the target populations of children under age five years and pregnant women, can result in a reduction in the occurrence of malaria episodes, all-cause child mortality and complications associated with malaria during pregnancy. Zambia's NMSP 2006–2010 set targets of 80% coverage, defined as use of ITNs among these populations. Attaining and maintaining high usage of ITNs is essential for reducing malaria transmission and malaria-related burden in Zambia.

In the MIS 2008, the use of ITNs was identified in each household using a complete net roster. The insecticide treatment status of each net was determined and individuals sleeping under each net the night before the survey were recorded.

Table 10 presents information on the use of mosquito nets by children. The results show that 55.3% of children under age five years were reported to have slept under a mosquito net the night before the survey, and 49.9% of children were reported to have slept under an ITN. In general, the results showed a higher net usage among younger (one year old) compared to older (two years old) age groups (**Figure 4**). This finding was true regardless of the types of nets used. Usage of both nets and ITNs was higher for children in rural areas (58.8% for mosquito nets and 52.5% for ITNs, respectively) than in urban areas (47.6% for mosquito nets and 44.3% for ITNs, respectively). Also, male children under age five years were equally as likely as females to have slept under a net or ITN. According to the wealth quintiles, children living in poorer households were slightly less likely to have slept under nets and ITNs as children in least poor areas. For example, 53.9% of children in the highest wealth quintile slept under an ever-treated net compared to 47.1% in the lowest quintile. Similarly, 51.4% of children under five years of age from the highest quintile slept under an ITN the night before the survey compared to 44.1% from the lowest quintile.

Western, North-Western and Eastern Province reported the highest percentage of children sleeping under ITNs at 63.9%, 60.5%, and 64.5%, respectively. Luapula and Lusaka provinces reported the lowest percentage of ITN use among children at 34.2% and 37.5%, respectively.

Considering only households with at least one mosquito net, use of nets among children under age five years the night before the survey reached 72.% (data not shown), and use of ITNs among children in this age group was 64.9% (**Figure 6**). This excludes children in households with no mosquito nets, as these would not otherwise have had the opportunity to sleep under a net. Overall availability of nets continues to be a significant barrier to reaching optimal levels of net and ITN use among children under age five years.

Figure 4: ITN use among children under age five years by age (Zambia 2010).

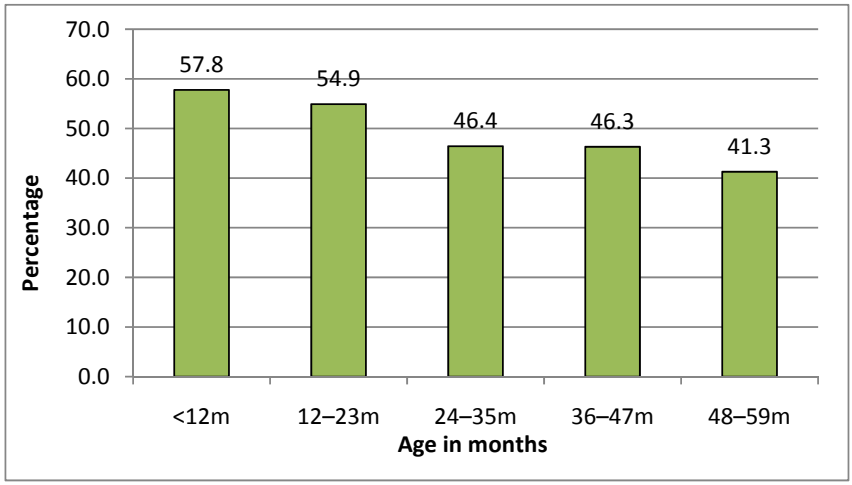


Table 10. Use of mosquito nets by children
Percentage of children under age five years who, the night before the survey, slept under a mosquito net, slept under an ever-treated net, and slept under an insecticide-treated net (ITN), by background characteristics (Zambia 2010)

Background characteristic	Percentage of children under age five years who slept under a net last night	Percentage of children under age five years who slept under an ever-treated net last night	Percentage of children under age five years who slept under an ITN[1] last night	Number of children under age five years
	(1)	(2)	(3)	(4)
Age (in years)				
<1	63.7	60.5	57.8	887
1	59.4	56.7	54.9	857
2	51.4	48.7	46.4	739
3	51.4	48.5	46.3	785
4	48.1	44.2	41.3	684
Sex				
Male	54.2	51.6	49.5	1,984
Female	56.5	52.9	50.3	1,967
Residence				
Urban	47.6	45.9	44.3	1,240
Rural	58.8	55.2	52.5	2,712
Province				
Central	61.8	58.9	58.1	419
Copperbelt	49.4	48.4	47.1	586
Eastern	68.6	67.2	64.5	505
Luapula	41.4	39.0	34.2	389
Lusaka	40.7	38.9	37.5	454
Northern	44.8	44.4	43.5	635
North-Western	69.1	61.5	60.5	205
Southern	64.5	54.6	51.6	500
Western	76.2	72.2	63.9	259
Wealth index				
Lowest	50.3	47.1	44.1	1,029
Second	58.4	55.0	53.2	625
Middle	54.3	50.8	48.7	791
Fourth	59.7	56.8	54.6	798
Highest	56.1	53.9	51.4	708
Total	55.3	52.3	49.9	3,951

[1]An insecticide-treated net (ITN) is 1) a factory-treated net that does not require any treatment, 2) a pretreated net obtained within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months.

Table 11 presents the percentage of all women ages 15 to 49 years and pregnant women who reported sleeping under mosquito nets the night before the survey. Approximately half (51.8%) of all women ages 15 to 49 slept under a mosquito net the night before the survey, and 47.7% slept under an ITN. For pregnant women, the percentages that slept under mosquito nets and ITNs were 52% and 45.9%, respectively.

Rural women ages 15 to 49 years were more likely to sleep under a net than urban women (58.5% and 43.1%, respectively) and to sleep under an ITN. Similarly, rural women were more likely to sleep under an ITN (53.3%) than urban women (39.7%). The same trend was observed among pregnant women; more rural pregnant women reported to have slept under both a net and a treated net than urban pregnant women.

Women in Western, North-Western and Eastern provinces were more likely to sleep under a net than the other six provinces. The provinces with lowest percentage of women who slept under a net the night before the survey were Lusaka, Luapula, Northern, and Copperbelt.

The percentage of pregnant women who slept under an ITN the night before the survey was higher (50.5%) in the lowest wealth quintile than in the highest quintile at 33.1%. This finding was also true for pregnant women who slept under an ever-treated net (52.7% and 34.6%, respectively).

Table 11. Use of mosquito nets by women ages 15 to 49 years and pregnant women
All women ages 15 to 49 years and pregnant women who slept under a mosquito net (treated or untreated), an ever-treated mosquito net, or an insecticide-treated net (ITN) the night before the survey, by background characteristics (Zambia 2010)

	Percentage of women who slept under a net last night	Percentage of women who slept under an ever-treated net last night	Percentage of women who slept under an ITN[1] last night	Number of women	Percentage of pregnant women who slept under a net last night	Percentage of pregnant women who slept under an ever-treated net last night	Percentage of pregnant women who slept under an ITN last night	Number of pregnant women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residence								
Rural	58.5	55.5	53.3	2,521	60.0	56.0	53.8	228
Urban	43.1	41.5	39.7	1,915	36.0	31.1	30.2	114
Province								
Central	59.8	56.5	54.8	443	67.0	59.3	59.3	45
Copperbelt	46.5	45.6	43.9	808	47.4	46.6	44.6	50
Eastern	65.4	64.9	61.6	515	66.9	66.9	66.9	38
Luapula	45.2	43.5	39.1	324	45.8	41.6	33.7	32
Lusaka	35.5	34.1	32.7	754	28.2	28.2	28.2	37
Northern	46.0	45.6	44.9	533	30.6	29.6	29.6	45
North-Western	66.5	62.2	62.2	239	73.9	73.9	73.9	18
Southern	56.3	48.4	46.6	542	49.9	34.9	34.9	52
Western	71.5	67.9	62.2	279	80.7	75.2	66.4	26
Wealth Index								
Lowest	50.6	47.8	45.3	832	58.6	52.7	50.5	83
Second	56.9	53.8	51.9	587	56.1	52.9	51.9	57

continued

Table 11. Use of mosquito nets by women ages 15 to 49 years and pregnant women
All women ages 15 to 49 years and pregnant women who slept under a mosquito net (treated or untreated), an ever-treated mosquito net, or an insecticide-treated net (ITN) the night before the survey, by background characteristics (Zambia 2010)

	Percentage of women who slept under a net last night	Percentage of women who slept under an ever-treated net last night	Percentage of women who slept under an ITN[1] last night	Number of women	Percentage of pregnant women who slept under a net last night	Percentage of pregnant women who slept under an ever-treated net last night	Percentage of pregnant women who slept under an ITN last night	Number of pregnant women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wealth Index (continued)								
Middle	53.6	50.7	49.1	802	49.8	44.0	42.6	79
Fourth	54.2	52.1	50.2	995	54.6	54.6	52.3	59
Highest	47.2	45.5	43.2	1,221	40.1	34.6	33.1	64
Total	51.8	49.5	47.4	4,436	52.0	47.7	45.9	342

[1]An insecticide-treated net (ITN) is 1) a factory-treated net that does not require any treatment, 2) a pretreated net obtained within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months.

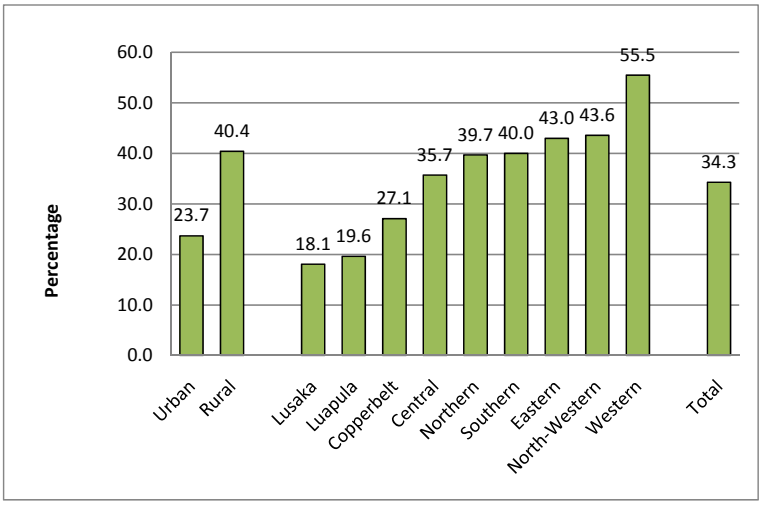
Coverage of mosquito nets and insecticide-treated nets among household members

Full coverage, including the availability and use of ITNs among all households and their members, is a priority for the NMCP. Since 2005, mass distribution of ITNs has been advancing throughout the country. In order to assess progress in achieving full coverage, this report examines the availability of ITNs in households to cover all household sleeping spaces and the use of ITNs among households beyond just those vulnerable members, such as children under age five and pregnant women.

At the national level, the NMCP has conducted mass distributions of nets with the target of providing three ITNs per household as ITNs have become available through funding and procurement channels. Locally, distribution is frequently guided by more practical issues, such as how many sleeping spaces are available within each household and how many ITNs the household may already have available. Similarly, to gauge progress, the percentage of households with sufficient ITNs to cover all sleeping spaces reported in the household is used for measuring the success in achieving full coverage of ITNs.

Figure 5 presents the percentage of households achieving a one-to-one ratio of ITNs to sleeping spaces. Nationally, 34.3% of households reported to have enough ITNs to cover all household sleeping spaces; rural areas reported nearly twice as many households with sufficient ITNs to cover all their sleeping spaces as urban areas (40.4% versus 23.7%, respectively). By province, Western province showed more than half of its households reporting full coverage availability of ITNs at household level. Lusaka and Luapula provinces reported less than 20% of their households with full coverage of ITN availability at household level.

Figure 5: Percentage of households with an ITN to sleeping space ratio of least one to one (Zambia 2010).



Use of mosquito nets and ITNs among all other household members is also important to gauge success in reaching full coverage targets for malaria prevention. **Table 12** shows that 42.0% of household members slept under an ITN the night before the survey. More females reported sleeping under ITNs than males (43.8% versus 40.0%, respectively) and more

household members living in rural areas reported sleeping under ITNs than in urban areas (46.7% versus 34.1%, respectively). The latter is affected by the overall availability of more ITNs in rural areas than urban areas. Among the provinces, Eastern, Western, and North-Western had the highest reported ITN use, while Lusaka and Luapula had the lowest.

Table 12. Use of mosquito nets among all household members
Among all household members, the percentage who slept under a mosquito net the night before the survey and percentage who slept under an insecticide-treated net (ITN), by background characteristics (Zambia 2010)

Background characteristic	Percentage of all household members who slept under a net last night	Percentage of all household members who slept under an ever-treated net last night	Percentage of all household members who slept under an ITN[1] last night	Number of all household members
	(1)	(2)	(3)	(4)
Sex				
Male	44.8	41.9	40.0	9,300
Female	48.3	45.7	43.8	10,011
Residence				
Urban	37.2	35.5	34.1	7,278
Rural	52.3	49.0	46.7	12,034
Province				
Central	53.6	50.2	49.1	1,904
Copperbelt	37.9	36.9	36.0	3,314
Eastern	59.5	58.5	56.0	2,557
Luapula	35.4	33.7	30.1	1,648
Lusaka	32.5	30.8	29.3	2,734
Northern	42.3	41.9	41.2	2,456
North-Western	58.8	54.6	53.4	1,050
Southern	52.8	43.5	41.3	2,421
Western	65.0	61.2	54.9	1,227
Wealth index				
Lowest	44.2	41.2	39.2	4,112
Second	49.9	47.0	45.1	2,359
Middle	48.5	45.3	43.4	3,684
Fourth	48.3	45.8	43.8	4,210
Highest	43.5	41.4	39.6	4,447
Total	46.6	43.9	42.0	19,311

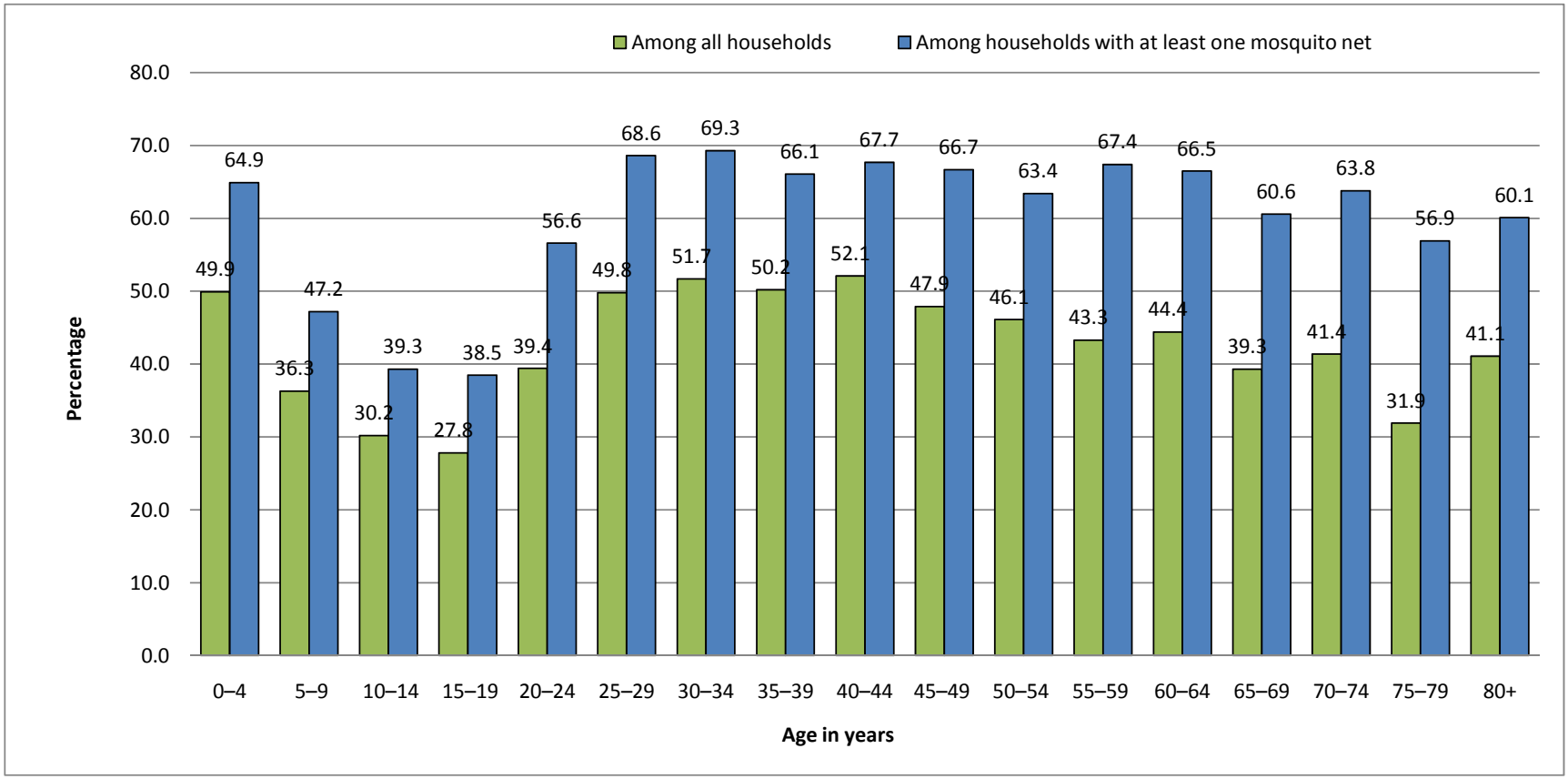
[1]An insecticide-treated net (ITN) is 1) a factory-treated net that does not require any treatment, 2) a pretreated net obtained within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months.

Figure 6 presents ITN use by age category for household members among all households and for households with at least one mosquito net. Among all households, regardless of net ownership, ITN use among adults aged 30 to 44 years was the highest reported among all age groups. Among children, those under age five have the highest reported use compared

to older children aged 5 to 14 years. Young children had higher reported use than older adults, too. Older children and young adults had the lowest reported use of ITNs.

Among households with at least one mosquito net, ITN use patterns were similar to all households. Children under age five and adults had the highest reported ITN use while older children and young adults had the lowest reported ITN use. The percentage of household members sleeping under an ITN the previous night among houses with at least one mosquito net was 56.4%.

Figure 6: ITN use among all household members by age category (Zambia 2010).



Indoor residual spraying

IRS is one of the primary malaria prevention strategies in Zambia and as of 2008–2009 was carried out in 36 target districts, representing mainly urban and peri-urban areas. These include fifteen districts reported in the 2006 and 2008 MIS reports as well as 21 additional districts added during 2008 located throughout the country.

Table 13 presents the results for IRS reported by all households included in the sample. This table has been modified since the 2008 MIS to reflect a better understanding of how to assess progress of the IRS programme as **Figure 7** suggests by varying the denominator based on where the sample cluster selection occurred based on the design. In previous MIS reports, this table presented results from only districts where IRS was conducted.

Table 13. Indoor residual spraying (IRS)
Among all households surveyed, the percentage of households reporting indoor residual spraying in the previous 12 months, and among households that reported spraying, the percentage that reported the spraying was conducted by government and private agents and the average number of months ago spraying was conducted, by background characteristics (Zambia 2010)

Background characteristic	Percentage of households sprayed in the previous 12 months	Number of households	Among households sprayed in the previous 12 months:			Number of sprayed houses
			Percentage sprayed by government	Percentage sprayed by private agents	Average number of months ago house sprayed	
	(1)	(2)	(3)	(4)	(5)	(6)
Residence						
Rural	14.6	2,766	92.6	2.3	5.6	400
Urban	37.9	1,595	85.4	8.1	6.0	599
Province						
Central	12.6	438	81.9	5.8	5.9	49
Copperbelt	43.4	676	79.4	16.7	5.7	293
Eastern	13.7	584	89.0	1.2	5.8	79
Luapula	17.8	363	82.7	0.0	6.2	65
Lusaka	31.9	640	93.0	6.5	6.5	204

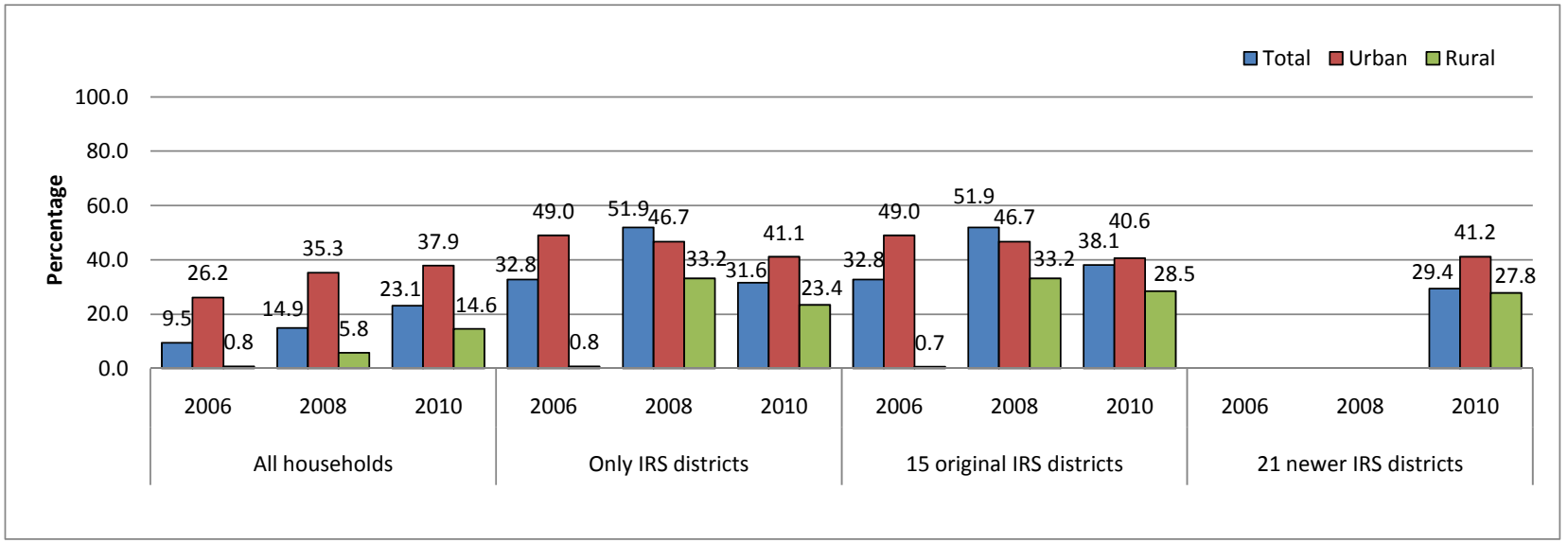
continued

Table 13. Indoor residual spraying (IRS)
Among all households surveyed, the percentage of households reporting indoor residual spraying in the previous 12 months, and among households that reported spraying, the percentage that reported the spraying was conducted by government and private agents and the average number of months ago spraying was conducted, by background characteristics (Zambia 2010)

Background characteristic	Percentage of households sprayed in the previous 12 months	Number of households	Among households sprayed in the previous 12 months:			Number of sprayed houses
			Percentage sprayed by government	Percentage sprayed by private agents	Average number of months ago house sprayed	
	(1)	(2)	(3)	(4)	(5)	(6)
Province (continued)						
Northern	13.3	572	94.7	0.0	5.2	74
North-Western	7.6	256	*	*	*	16
Southern	23.6	548	92.2	4.4	5.7	129
Western	28.0	315	100.0	0.0	4.8	88
Wealth index						
Lowest	11.9	859	92.2	0.9	5.8	101
Second	14.3	847	92.1	0.8	5.5	121
Middle	18.4	868	89.3	2.0	6.1	154
Fourth	30.5	908	90.4	4.2	5.9	276
Highest	39.6	879	83.5	11.8	5.7	346
Total	23.1	4,361	88.2	2.6	5.8	999

*An asterisk indicates that a figure is based on fewer than 25 cases and has been suppressed.

Figure 7: The effect of changing denominator on assessing progress in percentage of households sprayed (Zambia 2010).



The results as seen in **Table 13** indicate that 37.9% of households in the urban areas were sprayed in the previous 12 months, while 14.6% of rural households in these target districts had been sprayed. Households in Copperbelt and Lusaka provinces reported the highest percentage of households sprayed within the previous 12 months. Over 88% of this spraying was conducted by the government IRS programme. Copperbelt Province reported highest percentage of private agents conducting IRS activities (16.7%), which is largely attributed to the malaria control partnerships in spraying in the mining sector there.

Based on the wealth quintiles, poorer households have a lower percentage of IRS coverage than richer households. This is due to targeting of IRS activities to more urban areas of these districts. Poorer households are more likely to get their IRS through the government programmes than richer houses.

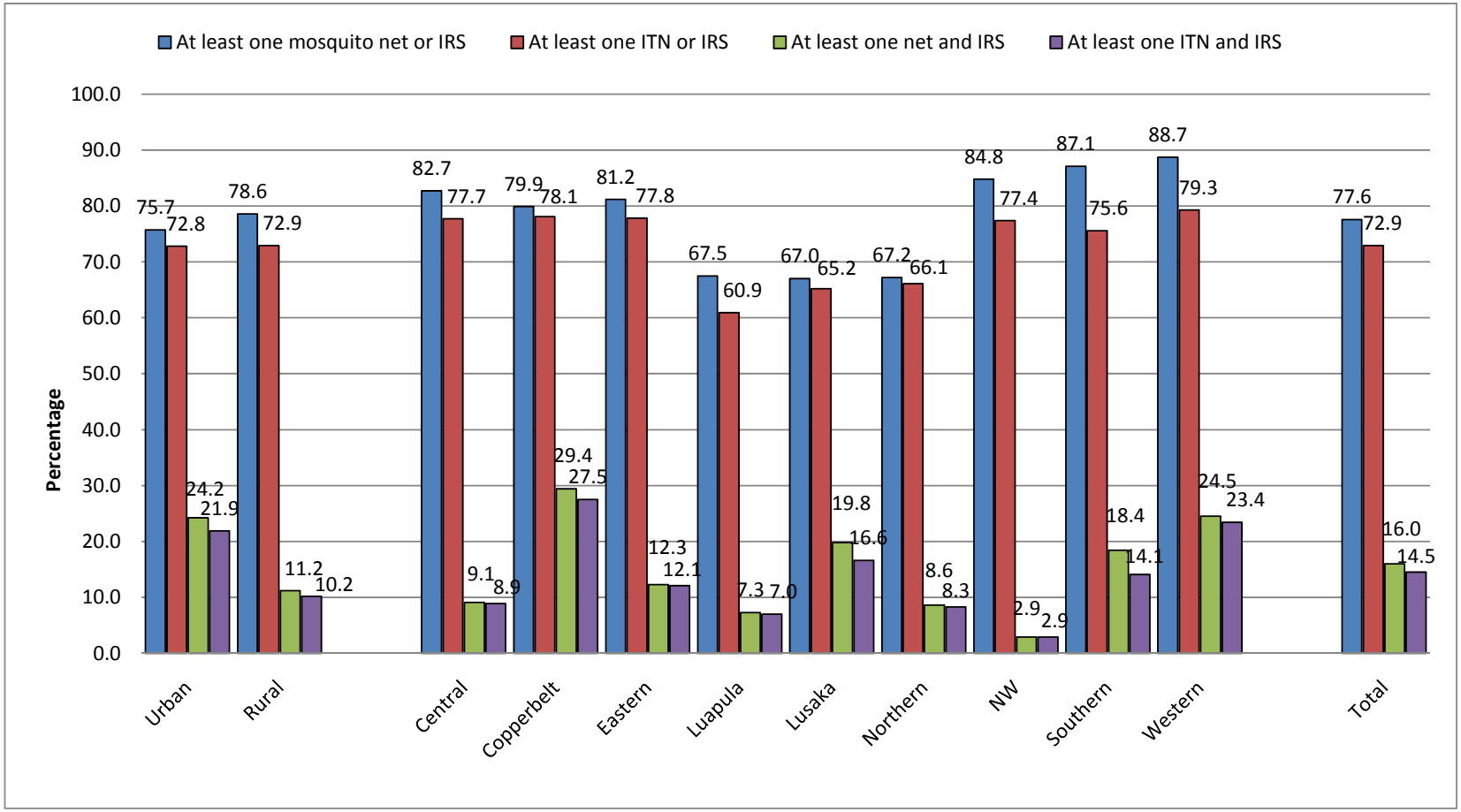
Among households sprayed within the previous 12 months, IRS activities were on average conducted within the past 6 months. Since the survey was conducted during April/May 2010, most houses were reportedly sprayed toward the end of 2009 in line with programmatic efforts to complete the annual spray cycle prior to the onset of the rains in November and December.

In Zambia, both ITNs and IRS are used for malaria transmission prevention. ITNs have been distributed through various strategies and partners since the beginning of Roll Back Malaria activities in the country. Until 2007, ITN mass distribution was targeted largely to areas that were not designated as IRS targeted areas. As an indication of combined coverage of ITN and IRS activities, **Figure 8** presents the percentage of households that reported having at least one mosquito net and/or IRS as well as, among those households, the percentage of households with at least one ITN or/and IRS.

Nearly seventy eight percent (77.6%) of households reported having at least one mosquito net or reported having been sprayed within the previous 12 months before the survey. Nearly seventy three percent (72.9%) of households reported having at least one ITN or reported having been sprayed within the previous 12 months before the survey. Western Province, followed by Southern Province, reported the highest levels of coverage of either mosquito nets or IRS.

Sixteen percent of households reported have both at least one mosquito net and their house sprayed and nearly fifteen percent (14.5%) reported having both at least one ITN and their house sprayed.

Figure 8. Percentage of households with at least one mosquito net or insecticide-treated net or indoor residual spraying (Zambia 2010).



Use of intermittent preventive treatment by pregnant women

The strategy of IPT for prevention of malaria during pregnancy has been implemented in Zambia since 2003. IPT is currently defined as having taken at least two treatment doses of an effective antimalarial drug during routine antenatal care visits starting from the second trimester and a month apart. In Zambia, SP, also known as Fansidar, is currently the drug used for IPT.

Table 14 presents the results for the use of IPT by pregnant women during the last birth in the five years preceding the survey. Eighty-nine percent (89.0%) of mothers reported taking an antimalarial drug for prevention during their last pregnancy. Nearly eighty-five percent (84.5%) of mothers received the antimalarial drug during a routine ANC visit. Among pregnant women, 70.2% took the recommended two or more doses of IPT. Not all of these doses were received through ANC visits. Sixty nine percent (69.4%) of mothers reported receiving two doses of IPT during the pregnancy where at least one of the doses was received during an ANC visit.

Responses varied by demographic characteristics. For example, urban women were more likely to have taken an antimalarial drug during their last pregnancy than rural women (93.1% and 86.9%, respectively). Urban women also were more likely than their rural counterparts to receive IPT during an ANC visit (89.4% vs. 81.9%), and to have taken at least two doses than rural women (78.7% and 65.7%, respectively).

Regional variations were also observed. Women in Copperbelt (82.2%) and North-Western (84.3%) provinces were more likely to have taken two doses of IPT than those in other provinces. Women in Luapula Province reported the lowest levels of two-dose IPT use during pregnancy (58.0%).

Women in the highest wealth index had the highest rates of antimalarial drug use (94.4% vs. 83.2% in the poorest index). This trend was consistent across all levels of IPT use regardless of the source of IPT.

Table 14. Use of intermittent preventive treatment (IPT) by pregnant women
For the last birth in the five years preceding the survey, percentage for which the mother took antimalarial drugs for prevention during the pregnancy and percentage for which the mother received IPT during an antenatal visit, by background characteristics (Zambia 2010)

Background characteristic	Percentage of mothers who took any antimalarial drug for prevention during their last pregnancy	Percentage of mothers who took any IPT[1]	Percentage of mothers who took 2+ doses of IPT	Percentage of mothers who received IPT during ANC visit	Percentage of mothers who received 2+ doses of IPT, at least one of which was during an ANC visit	Number of mothers
	(1)	(2)	(3)	(4)	(5)	(6)
Residence						
Urban	93.1	90.8	78.7	89.4	77.3	840
Rural	86.9	82.6	65.7	81.9	65.2	1,595

continued

Table 14. Use of intermittent preventive treatment (IPT) by pregnant women
For the last birth in the five years preceding the survey, percentage for which the mother took antimalarial drugs for prevention during the pregnancy and percentage for which the mother received IPT during an antenatal visit, by background characteristics (Zambia 2010)

Background characteristic	Percentage of mothers who took any antimalarial drug for prevention during their last pregnancy	Percentage of mothers who took any IPT[1]	Percentage of mothers who took 2+ doses of IPT	Percentage of mothers who received IPT during ANC visit	Percentage of mothers who received 2+ doses of IPT, at least one of which was during an ANC visit	Number of mothers
	(1)	(2)	(3)	(4)	(5)	(6)
Province						
Central	92.9	89.5	69.8	87.8	68.5	266
Copperbelt	93.3	90.0	82.2	87.3	80.1	393
Eastern	86.0	83.8	70.1	83.8	70.1	343
Luapula	84.3	79.0	58.0	79.0	58.0	240
Lusaka	91.8	89.8	78.0	87.7	76.3	295
Northern	85.1	79.0	63.1	79.0	63.1	353
North-Western	96.7	96.7	84.3	96.7	84.3	141
Southern	86.6	82.9	60.6	81.3	60.0	326
Western	85.4	82.8	65.1	82.0	65.1	79
Wealth index						
Lowest	83.2	77.9	60.6	77.7	60.5	565
Second	84.1	79.5	60.9	78.4	60.7	369
Middle	88.7	85.9	69.0	84.4	68.5	479
Fourth	94.1	92.0	76.4	90.8	75.9	493
Highest	94.4	92.8	82.6	89.9	80.0	485
Education						
None	84.1	79.5	63.0	78.9	63.0	262
Primary	87.9	83.8	66.8	82.7	66.3	1,301
Secondary	92.4	90.8	77.4	89.1	76.3	798
Higher	90.0	88.6	77.7	83.5	72.6	75
Total	89.0	85.8	70.2	84.5	69.4	2,435

[1]IPT is intermittent preventive treatment with Fansidar/SP.

Prevalence and prompt treatment of fever

The treatment component of Zambia's malaria control programme focuses on prompt provision of effective drugs. In the face of increasing resistance to chloroquine and SP, the MOH in 2003 designated ART-LUM (Coartem®) as first-line therapy for all Zambians over 5 kg. The specific guidelines, as outlined in the MOH's Guidelines for the Diagnosis and Treatment of Malaria in Zambia, recommend Coartem® as first-line therapy for uncomplicated malaria in children over 5 kg, and SP for uncomplicated malaria in children under 5 kg. Quinine is designated as the lead drug for complicated malaria.

According to the current malaria control strategy, Zambia aims to treat 80% of patients within 24 hours of symptom onset by the end of the current NMSP (2006–2010). Prompt presentation of febrile children to health facilities is essential to meeting this target.

Table 15 presents results for prevalence of fever among children under age five years and treatment-seeking behaviour for these children. Just over thirty four percent (34.1%) of children had a fever in the last two weeks. Of these, 34.0% took an antimalarial drug, and 18.7% took the drug within 24 hours of symptom onset. This indicates an improvement in malaria case management compared to the 2008 MIS report (MIS, 2008). Only 31.2% sought treatment from a health facility/provider within that time period. The highest prevalence of fever was seen in children ages 36–47 months (38.4%), followed by those ages 12 to 23 months (37.2%).

Among children with fever, 16.7% reported having a heel or finger stick when they sought treatment during their fever episode. Copperbelt and Lusaka provinces reported the highest reported levels of heel or finger sticks.

Children in rural areas were more likely to suffer from fever than those in urban areas (37.5% and 26.1%, respectively). However, children in rural areas were as likely to take an antimalarial drug for the febrile episode as were their urban counterparts (35.6% and 35.4%, respectively), and were as likely as urban children to take an antimalarial drug within 24 hours (19.0% and 17.7%, respectively).

In the lowest wealth quintile, 41.2% of children suffered from fever in the last two weeks, and 33.3% of those took an antimalarial drug. Nearly sixteen percent (15.7%) were treated promptly within 24 hours and almost one quarter (24.8%) were seen by a health provider/facility in that time period.

Table 15. Prevalence and prompt treatment of fever among children
Children under age five years with fever in the two weeks preceding the survey, and among children with fever, percentage who took antimalarial drugs and who took the drugs the same/next day, by background characteristics (Zambia 2010)

Background characteristic	Percentage of children with fever in last two weeks	Number of children under age five years	Among children with fever:				Number of children with fever
			Percentage who reported having finger or heel stick	Percentage who took antimalarial drugs	Percentage who took antimalarial drugs same day/next day	Percentage who sought treatment from a facility/provider same day/next day	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age (in months)							
<12	28.5	779	16.8	28.4	15.7	32.7	206
12–23	37.2	731	15.3	28.5	14.2	32.0	251
24–35	36.3	605	18.1	37.5	21.1	33.7	209
36–47	38.4	601	16.8	40.5	20.6	24.6	218
48–59	30.4	536	17.0	36.7	23.8	34.2	155
Sex							
Male	35.3	1,619	17.1	34.0	18.2	29.6	537
Female	32.9	1,633	16.4	34.1	19.2	33.0	502
Residence							
Urban	26.1	978	21.0	35.4	17.7	33.0	247
Rural	37.5	2,274	15.4	35.6	19.0	30.7	792
Province							
Central	32.6	355	11.2	14.6	5.4	44.7	113
Copperbelt	30.0	499	28.2	40.9	16.9	24.6	143
Eastern	37.0	448	19.9	58.3	48.9	40.6	157

continued

Table 15. Prevalence and prompt treatment of fever among children
Children under age five years with fever in the two weeks preceding the survey, and among children with fever, percentage who took antimalarial drugs and who took the drugs the same/next day, by background characteristics (Zambia 2010)

Background characteristic	Percentage of children with fever in last two weeks	Number of children under age five years	Among children with fever:				Number of children with fever
			Percentage who reported having finger or heel stick	Percentage who took antimalarial drugs	Percentage who took antimalarial drugs same day/next day	Percentage who sought treatment from a facility/provider same day/next day	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Province (continued)							
Luapula	52.3	349	15.1	28.4	7.6	24.6	170
Lusaka	17.5	336	15.2	36.2	26.0	44.6	57
Northern	32.2	522	7.6	32.9	12.8	13.1	150
North-Western	19.9	177	27.8	68.5	14.0	19.6	34
Southern	40.7	460	15.1	21.8	18.4	36.5	169
Western	42.5	106	19.3	18.3	6.5	43.5	44
Wealth index							
Lowest	41.2	850	13.0	33.3	15.7	24.8	321
Second	39.2	524	18.4	33.5	20.6	33.6	194
Middle	35.6	647	15.4	31.3	17.8	38.5	220
Fourth	29.6	662	15.4	35.5	19.8	30.0	188
Highest	22.0	568	30.6	39.7	23.4	33.3	116
Total	34.1	3,252	16.7	34.0	18.7	31.2	1,039

Table 16 represents drugs taken for fever and drugs taken within 24 hours of symptom onset. According to the survey results, Coartem® is the most common antimalarial drug given for fever: 25.9% of children with fever in the last two weeks were treated with Coartem®, 3.6% with SP, and 4.0% with quinine (for severe malaria according to the treatment guidelines). Among children treated within 24 hours of onset of fever, 13.4% were given Coartem®, 2.3% SP and 2.5% quinine. This is indicative of an improvement from the 2008 MIS in access to the first line treatment (Coartem®)(MIS,2008), due improved case management through appropriate use as guided by the national policy.

Children in urban areas were more likely to report taking Coartem® than those in rural areas (27.4% urban vs. 25.4% rural, 11.6% urban use within 24 hours vs. 14.0% rural use within 24 hours).

Table 16. Type and timing of antimalarial drugs
Among children under age five with fever in the two weeks preceding the survey, percentage who took first-line drug, second-line drug, or other antimalarial drugs and percentage who took each type of drug the same/next day after developing fever and/or convulsions, by background characteristics (Zambia 2010)

	Percentage of children who took drug				**Percentage of children who took drug same/next day**				
Background characteristic	Coartem®[1]	SP[1]	Quinine	Other antimalarial	Coartem®	SP	Quinine	Other antimalarial	**Number of children with fever**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age (in months)									
<12	21.6	4.5	1.6	0.7	11.0	2.5	1.5	0.7	206
12–23	24.4	2.5	1.6	0.0	10.3	2.3	1.5	0.0	251
24–35	27.3	3.6	5.8	0.9	13.9	2.0	4.9	0.9	209
36–47	29.4	4.4	6.8	0.0	16.9	2.1	1.6	0.0	218
48–59	27.2	3.0	5.0	1.5	16.2	2.8	3.4	1.5	155
Residence									
Urban	27.4	5.8	1.5	0.9	11.6	5.2	0.5	0.5	247
Rural	25.4	2.9	4.8	0.4	14.0	1.4	3.1	0.4	792
Province									
Central	4.8	6.1	0.9	2.8	0.5	2.2	0.9	1.8	113

continued

Table 16. Type and timing of antimalarial drugs
Among children under age five with fever in the two weeks preceding the survey, percentage who took first-line drug, second-line drug, or other antimalarial drugs and percentage who took each type of drug the same/next day after developing fever and/or convulsions, by background characteristics (Zambia 2010)

	Percentage of children who took drug				Percentage of children who took drug same/next day				
Background characteristic	Coartem®[1]	SP[1]	Quinine	Other antimalarial	Coartem®	SP	Quinine	Other antimalarial	**Number of children with fever**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Province (continued)									
Copperbelt	33.0	3.1	4.6	0.2	12.7	2.9	1.2	0.2	143
Eastern	43.6	3.3	11.0	0.4	36.1	3.4	9.1	0.4	157
Luapula	26.3	1.0	0.8	0.0	7.6	0.0	0.0	0.0	170
Lusaka	21.1	15.0	0.0	0.0	12.5	13.6	0.0	0.0	57
Northern	27.1	4.1	1.6	0.0	10.5	0.7	1.7	0.0	150
North-Western	43.2	1.9	23.4	0.0	0.0	1.9	12.1	0.0	34
Southern	17.6	1.4	2.0	0.8	15.2	1.4	1.0	0.8	169
Western	11.7	2.1	4.5	0.0	4.9	0.4	1.2	0.0	44
Total	25.9	3.6	4.0	0.5	13.4	2.3	2.5	0.4	1,039

[1]Coartem® is artemether-lumefantrine (ART-LUM); SP is sulfadoxine-pyrimethamine.

Table 17 represents the source of antimalarial drugs given to children under age five years with fever in the two weeks preceding the survey. The majority of drugs (80.5%) were obtained from a government health facility. Respondents also reported using medications already present in the home (8.2%) or purchased at a shop (3.7%). Nearly eighty-six percent (85.4%) of Coartem® treatment was obtained through a government health facility as was 54.8% of SP.

Table 17. Source of antimalarial drugs
Percent distribution of antimalarial drugs given to children under age five years with fever in the two weeks preceding the survey, by source of the drugs (Zambia 2010)

Background characteristic	Already had drug at home	Community health worker	Government health facility/ worker	Private health facility/ worker	Shop	Other	Total	Number of children who took drug
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Coartem®	6.1	1.7	85.4	2.1	2.8	1.9	100.0	272
SP/Fansidar	11.8	7.6	54.8	9.4	16.3	0.0	100.0	34
Quinine	13.2	0.0	78.3	8.5	0.0	0.0	100.0	43
Other antimalarial	51.2	0.0	16.5	32.3	*	*	100.0	6
All antimalarial drugs	8.2	2.1	80.5	4.1	3.7	1.4	100.0	356

Note: Table excludes children whose fever started less than two days before the interview. SP is sulfadoxine-pyrimethamine.

* Figure is based on fewer than 25 cases and has been suppressed.

Chapter 4: Malaria parasite and anaemia prevalence

Table 18 presents findings on prevalence of malaria and anaemia in children under age five years. For the purposes of the survey, children with malaria parasites are defined as malaria microscopy-positive, any anaemia is defined as haemoglobin (Hb) less than 11 grams/decilitre (g/dl), and severe anaemia is defined as a haemoglobin level less than 8 grams/decilitre (g/dl).

Overall, malaria parasite prevalence was 16.0% with more parasitaemia among children in rural areas (20.4%) compared to urban areas (5.2%). On average, parasitaemia prevalence peaked among children aged three years and was highest in Luapula Province (50.5%) and in the lowest wealth quintile (29.2%).

Nearly sixty-one percent (60.8%) of children were found with any anaemia, with younger children reporting the highest levels of anaemia. Luapula and Eastern provinces reported the highest levels of anaemia, 79.7% and 67.7%, respectively. Severe anaemia was found to be the highest in Luapula and Northern provinces at 20.8% and 11.0%, respectively.

Nationally, severe anaemia prevalence was 9.2%; it was higher in rural areas than urban areas (10.2% and 6.8%, respectively) and there was little difference in severe anaemia rates between males and females (9.6% and 8.8%). In addition, severe anaemia was observed to be higher where there was high parasite prevalence.

RDTs are used during field work for immediate treatment of positive cases and RDTs have previously been shown to report higher levels of malaria positivity than microscopy in Zambia (Keating 2009). For this reason, the Zambia survey showed some discordant results with regard to parasite prevalence between microscopy (15.8%) and RDT (26.7%) results. These results may be due to persistent antigenemia after effective treatment of malaria. The clearance of this antigenemia varies due to many factors such as differences in immunogenicity and parasite density carried by different individuals. Microscopy is still considered the “gold standard” for reporting malaria parasite prevalence and is used throughout this report for reporting malaria prevalence for 2010 and for comparison with previous MISs conducted in Zambia in 2006 and 2008.

Table 18. Malaria parasite prevalence and anaemia in children under age five years
Among children, percentage with malaria parasites by microscopy (and who tested RDT positive), mean haemoglobin (Hb) values, standard deviation of haemoglobin values, and percentage with any anaemia (less than 11 grams/decilitre) and severe anaemia (less than 8 grams/decilitre), by background characteristics (Zambia 2010)

Background characteristic	Percentage with malaria parasites read by microscopy (or RDT)	Mean haemoglobin value	Standard error of haemoglobin	Percentage of children with any anaemia	Percentage of children with severe anaemia	Number of children
	(1)	(2)	(3)	(4)	(5)	(6)
Age (in months)						
<12	5.7 (12.5)	10.2	0.09	68.6	8.0	639
12–23	12.1 (21.9)	10.0	0.08	70.3	9.3	708
24–35	20.1 (30.8)	10.2	0.10	62.4	12.1	618
36–47	21.4 (36.1)	10.5	0.11	53.4	10.4	643
48–59	22.0 (33.7)	10.8	0.10	46.5	5.8	555
Sex						
Male	16.9 (26.8)	10.2	0.07	63.0	9.6	1,588
Female	15.1 (26.7)	10.4	0.08	58.6	8.8	1,574
Residence						
Urban	5.2 (12.0)	10.5	0.09	57.0	6.8	920
Rural	20.4 (32.7)	10.3	0.09	62.4	10.2	2,242
Province						
Central	9.4 (11.5)	10.6	0.13	56.8	4.1	306
Copperbelt	12.1 (24.0)	10.3	0.13	61.9	9.6	480
Eastern	22.0 (50.1)	10.1	0.10	67.7	9.9	438

continued

Table 18. Malaria parasite prevalence and anaemia in children under age five years
Among children, percentage with malaria parasites by microscopy (and who tested RDT positive), mean haemoglobin (Hb) values, standard deviation of haemoglobin values, and percentage with any anaemia (less than 11 grams/decilitre) and severe anaemia (less than 8 grams/decilitre), by background characteristics (Zambia 2010)

Background characteristic	Percentage with malaria parasites read by microscopy (or RDT)	Mean haemoglobin value	Standard error of haemoglobin	Percentage of children with any anaemia	Percentage of children with severe anaemia	Number of children
	(1)	(2)	(3)	(4)	(5)	(6)
Province (continued)						
Luapula	50.5 (63.4)	9.4	0.16	79.7	20.8	311
Lusaka	0.0 (1.4)	10.6	0.11	54.6	4.2	305
Northern	23.6 (32.6)	10.4	0.24	57.3	11.0	511
North-Western	6.1 (17.3)	10.8	0.14	54.1	2.9	168
Southern	5.7 (12.2)	10.5	0.23	57.0	8.0	424
Western	5.1 (11.8)	10.7	0.18	52.7	7.6	220
Wealth index						
Lowest	29.2 (42.1)	9.9	0.13	69.2	14.4	850
Second	21.8 (36.2)	10.2	0.12	63.8	11.3	516
Middle	12.1 (22.9)	10.5	0.09	57.9	6.5	649
Fourth	9.4 (20.6)	10.5	0.08	57.3	7.5	622
Highest	1.4 (4.4)	10.7	0.09	52.1	4.1	526
Total	16.0 (26.7)	10.3	0.07	60.8	9.2	3,162

Chapter 5: General malaria knowledge

The main aim of advocacy, information, education, and communication as well as community mobilization for malaria control is to contribute to the reduction of malaria morbidity and mortality through behaviour change. In order for the community to appreciate and accept key interventions, information must be made available to change attitudes, influence behaviour patterns, gain approval, and enhance skills required for malaria management and prevention at individual, household, and community levels.

Communicating important malaria messages to malaria-vulnerable populations is also a key component to improving malaria intervention uptake throughout the country. Messages such as the importance of sleeping under ITNs, seeking treatment for fever promptly, or allowing one's house to be sprayed during spray campaigns are an important part of the information, education, and communication strategy of the NMCP and partner efforts to promote household level utilisation and penetration of malaria interventions.

Table 19 presents data on respondents' awareness of malaria, its primary symptom (fever), its route of transmission, and of measures of prevention and control such as nets and IRS. Among eligible women ages 15 to 49 years, a general knowledge of malaria, symptom recognition, and methods of prevention is necessary to ensure appropriate treatment and prevention behaviour.

The majority of women had heard of malaria (99.3%) with little variation across regions, urban and rural areas, wealth index, or education level.

Overall, 75.3% of women recognized fever as a symptom of malaria. Those in rural areas were as likely to report this knowledge as women in urban areas (74.9% and 75.8%, respectively). There were marginal differences in this knowledge by province and increasing wealth quintile.

Recognition of mosquitoes as the vector for malaria transmission is essential for consistent and successful use of prevention tools. Across Zambia, 84.7% of women reported that mosquito bites cause malaria. Women in urban areas were more likely to recognize this than those in rural areas (90.2% and 80.8%, respectively). Women in the lower wealth quintiles were less likely to be aware of mosquito transmission than women in higher wealth quintiles. Knowledge rose with education level, with 64.3% of women with no education recognizing the transmission source and nearly all surveyed women with a higher education recognizing it (98.8%). Regional differences were also observed—women in Lusaka, North-Western and Copperbelt provinces were more likely to note mosquito transmission. Women in Northern Province showed the lowest knowledge of transmission source (73.3%).

Specific knowledge of prevention methods is also key to effective control. Overall, 81.7% of women reported that use of mosquito nets could prevent malaria. Urban women were more likely to note this than rural women (87.7% urban vs. 77.5% rural).

Table 19. General malaria knowledge
Among eligible women ages 15 to 49 years, the percentage who reported having heard of malaria, recognized fever as a symptom of malaria, reported mosquito bites as a cause of malaria, and reported mosquito nets (treated or untreated) as a prevention method for malaria, by background characteristics (Zambia 2010)

Background characteristic	Percentage who had heard of malaria	Percentage who recognized fever as a symptom of malaria	Percentage who reported mosquito bites as a cause of malaria	Percentage who reported mosquito nets (treated or untreated) as a prevention method	Number of women
	(1)	(2)	(3)	(4)	(5)
Residence					
Urban	97.7	75.8	90.2	87.7	1,648
Rural	94.5	74.9	80.8	77.5	2,352
Province					
Central	97.3	77.4	85.0	86.5	401
Copperbelt	98.6	75.3	89.2	84.3	771
Eastern	99.0	76.0	80.0	73.3	499
Luapula	98.5	74.3	89.1	88.2	318
Lusaka	99.2	77.8	91.9	87.4	565
Northern	90.9	73.5	73.3	66.3	461
North-Western	99.3	84.1	91.1	91.8	215
Southern	90.0	68.6	81.4	83.1	517
Western	85.9	75.4	79.3	78.1	252
Wealth index					
Lowest	91.8	74.5	75.1	70.7	760
Second	93.1	72.0	78.3	75.3	551
Middle	95.8	73.9	82.9	79.4	752
Fourth	98.0	75.9	88.5	86.3	884
Highest	98.3	78.0	93.0	90.8	1,035
Education					
None	85.4	60.9	64.3	61.6	392
Primary	95.4	75.0	81.3	77.5	1,867
Secondary	98.5	77.6	92.2	90.3	1,571
Higher	99.3	90.2	98.8	95.1	170
Total	99.3	75.3	84.7	81.7	3,999

Figure 9 presents the responses most often reported as methods of prevention of malaria. More women ages 15 to 49 years (67%) reported use of a mosquito net for malaria prevention, followed by use of a treated mosquito net (20%). Use of ITNs and house spraying as malaria prevention methods were reported more in urban areas (23% and 15%, respectively) than in rural areas (18% and 4%, respectively). Household spraying was also mentioned as a malaria prevention method in urban areas.

Figure 9. Among women ages 15 to 49 years, knowledge of malaria prevention methods (Zambia 2010).

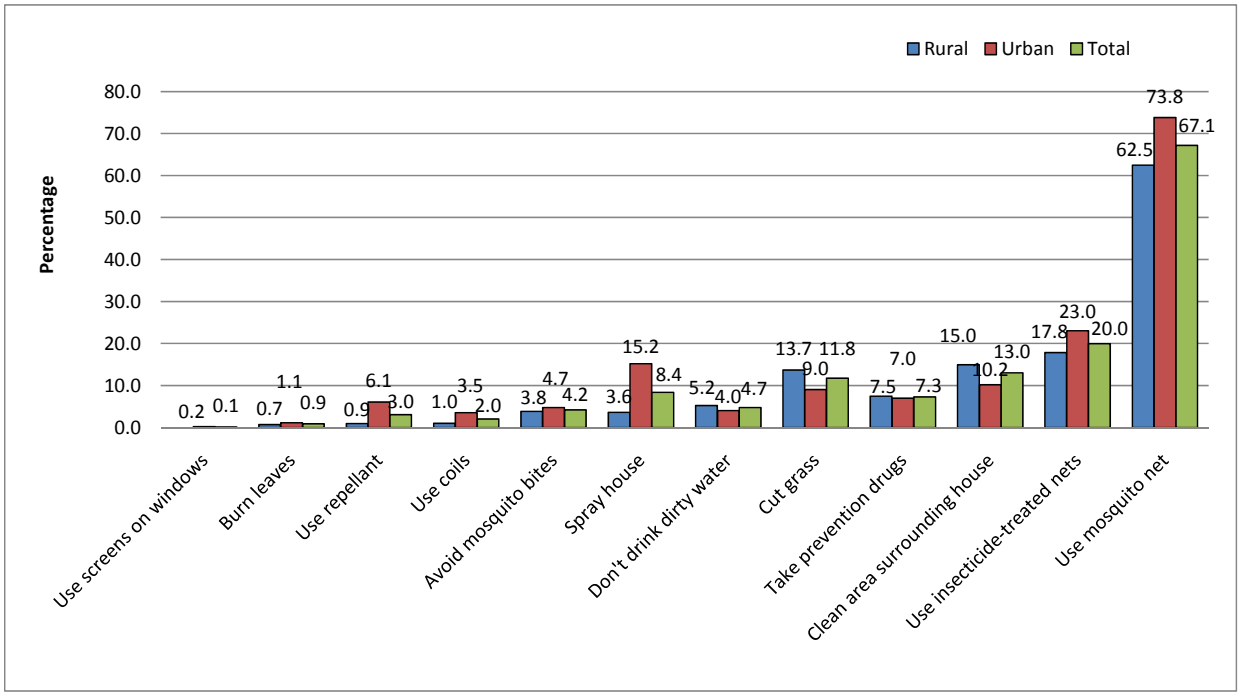


Table 20 presents information on the exposure to malaria messages among women ages 15 to 49 years. When asked if they had seen or heard malaria messages, 69.2% of women responded positively. More women in urban areas (72%) reported to have seen or heard malaria messages than in rural areas (67.3%). Over 88% of women in the highest education level reported to have seen or heard malaria messages and the percentages decreased with lower education levels.

Among women who reported to have seen or heard messages, the average number of months prior to the survey that the messages were seen or heard was 4.5 months. Women in Lusaka and North-Western provinces had, on average, reported most recently seeing or hearing messages less than three months earlier (2.8% and 2.6%, respectively). Nearly sixty-six percent (65.8%) of women reported government hospitals or clinics as the source of the messages. When asked about the content of the messages seen or heard, 36.8% reported seeing or hearing messages about the importance of sleeping under mosquito nets.

Table 20. Malaria messaging through information, education and communication strategies
Among eligible women ages 15 to 49 years, the percentage who reported having heard messages about malaria, and the average number of months ago the messages were heard, the percentage who reported a government hospital/clinic as the source of the malaria message, and the percentage who reported seeing/hearing a message about the importance of sleeping under a mosquito net among those who reported seeing/hearing a malaria message, by background characteristics (Zambia 2010).

Background characteristic	Percentage who have seen/heard malaria messages	Number of women	Among women who reported hearing a malaria message:			
			Average number of months ago malaria message heard	Percentage who reported government hospital/clinic as the source of malaria message	Percentage who reported seeing/hearing a message about the importance of sleeping under a mosquito net	Number of women
	(1)	(2)	(3)	(4)	(5)	(6)
Residence						
Urban	72.0	1,648	4.7	53.0	37.4	1,187
Rural	67.3	2,352	4.5	75.5	36.2	1,582
Province						
Central	81.3	401	5.1	65.3	45.9	326
Copperbelt	65.2	771	5.5	61.2	46.5	502
Eastern	56.4	499	4.0	67.2	29.8	281
Luapula	59.1	318	5.8	81.2	60.4	188
Lusaka	74.1	565	2.8	34.3	19.5	419
Northern	66.4	461	5.3	80.9	25.3	306
North-Western	87.1	215	2.6	84.7	51.0	187
Southern	74.0	517	5.0	66.8	26.2	383
Western	70.1	252	4.2	88.4	46.4	177
Wealth index						
Lowest	60.8	760	4.9	80.4	32.9	462
Second	67.1	551	5.2	73.8	35.8	369
Middle	69.5	752	4.2	69.4	33.4	522
Fourth	71.8	902	4.6	65.4	34.0	647
Highest	74.2	1,035	4.3	51.2	44.2	768
Education						
None	51.7	392	5.7	77.9	25.8	202
Primary	67.1	1,867	4.6	72.4	32.3	1,252
Secondary	74.1	1,571	4.4	60.1	42.6	1,165
Higher	88.2	170	3.6	39.3	43.0	150
Total	69.2	3,999	4.5	65.8	36.8	2,769

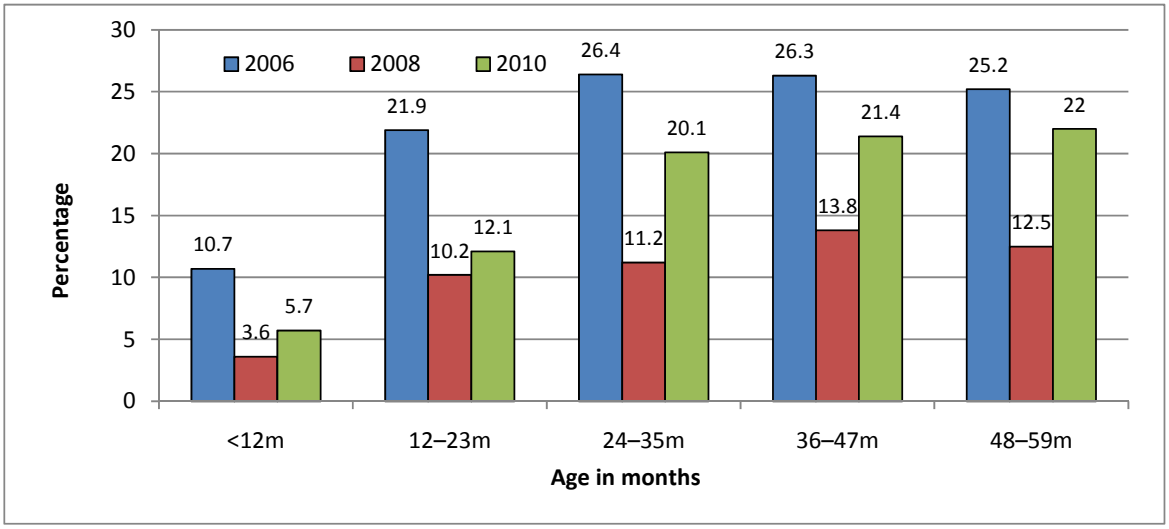
Chapter 6: Comparison of malaria indicator survey results: 2006–2010

Much progress has been made in controlling malaria in Zambia since the first MIS in 2006. The following section provides a description of how the NMCP in Zambia has been successful and where it continues to face challenges based on the results of the 2006, 2008, and 2010 MISs. In particular, the summary examines parasitaemia and anaemia rates, coverage and usage of ITNs, and IRS.

Malaria parasite and severe anaemia prevalence

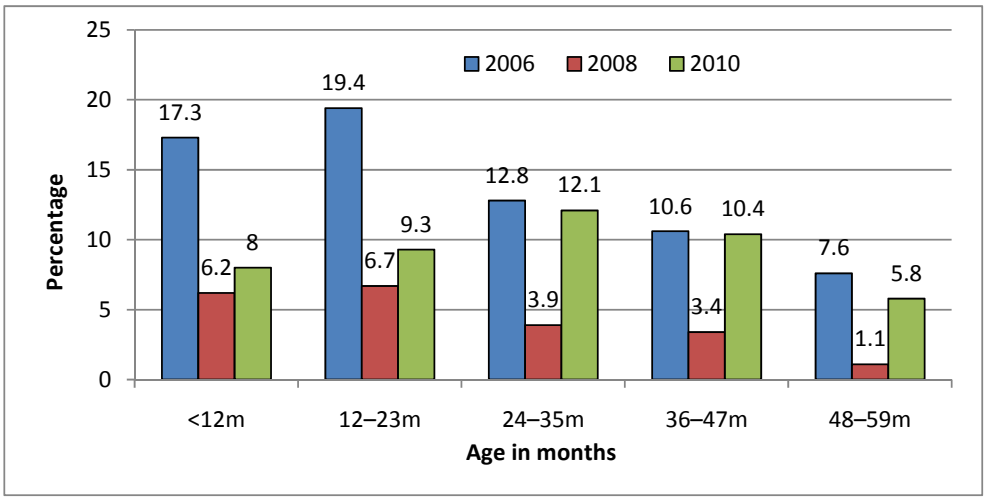
Malaria parasite prevalence, as measured by slide microscopy, and severe anaemia (Hb<8 g/dl) have changed quite dramatically across the MISs conducted in 2006, 2008, and 2010. Overall, malaria parasite prevalence by microscopy was found to be 21.8%, 10.2%, and 16.0% in 2006, 2008 and 2010, respectively while severe anaemia prevalence was found to be 13.8%, 4.3%, and 9.2% in 2006, 2008 and 2010, respectively. Malaria parasite rates typically increase with increasing age in the first five years of life. **Figure 10** shows this pattern has been consistent since 2006. Notable is that the peak in parasitaemia among children under age five has shifted slightly from age two years to age three years across this period. Further, despite a tremendous drop in parasite prevalence between 2006 and 2008, the decrease in parasitaemia that persisted between 2006 and 2010 seems to be greatest among children under age two.

Figure 10: Malaria parasite prevalence by age among children under age five years (Zambia 2006–2010).



Severe anaemia prevalence was higher in children under age 24 months in 2006, but by 2010, it peaked in children age two (**Figure 11**). Across all three surveys among children under age five, severe anaemia prevalence began to decline after age two. The increases in severe anaemia prevalence reported in 2010 were more substantial in older children than in younger children.

Figure 11: Severe anaemia prevalence (Hb<8g/dl) by age among children under age five years (Zambia 2006–2010).



By geographic residence, malaria parasite prevalence continues to be greatest in rural areas. **Figure 12** shows rural and urban prevalence since 2006. No substantial change has occurred since 2006 with respect to malaria prevalence among children in urban areas, while in rural areas, about half of the initial decrease seen between 2006 and 2008 was reclaimed by 2010.

Figure 12: Malaria parasite prevalence among children under age five years by urban and rural areas (Zambia 2006–2010).

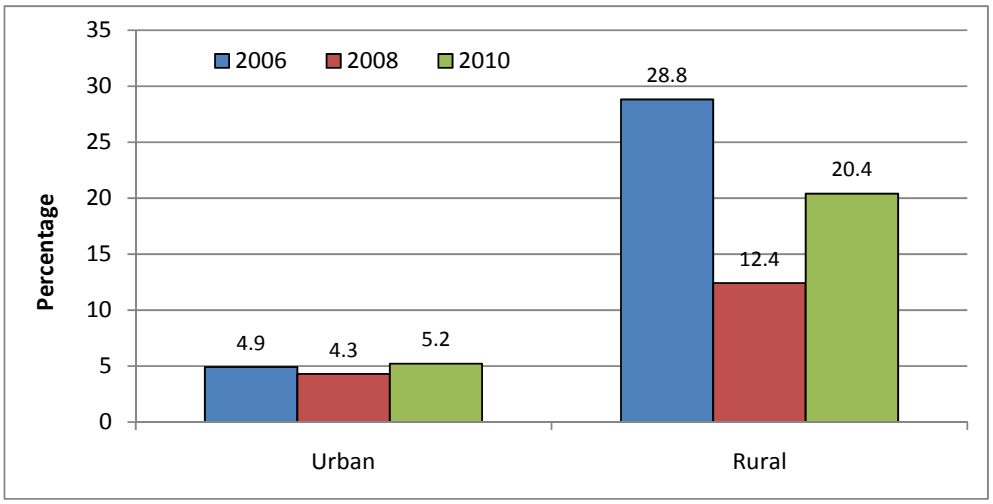


Figure 13 shows malaria parasite prevalence patterns across the nine provinces in Zambia. Lusaka Province initially had quite low levels of transmission and this stayed very low and stable over the last several years. Southern, Western, North-Western, and Central provinces reported less than 10% parasitaemia in 2010 with Southern and North-Western provinces showing a steady decrease from 2006 to 2010. Copperbelt Province showed little change in parasitaemia compared to 2006. Eastern, Northern, and Luapula provinces, while initially showing declines in parasitaemia in 2008 compared to 2006, all showed an increase in parasitaemia in 2010, with parasite rates in young children in Luapula exceeding 50% in 2010.

Figure 13: Malaria parasite prevalence among children under age five years, by province (Zambia 2006–2010).

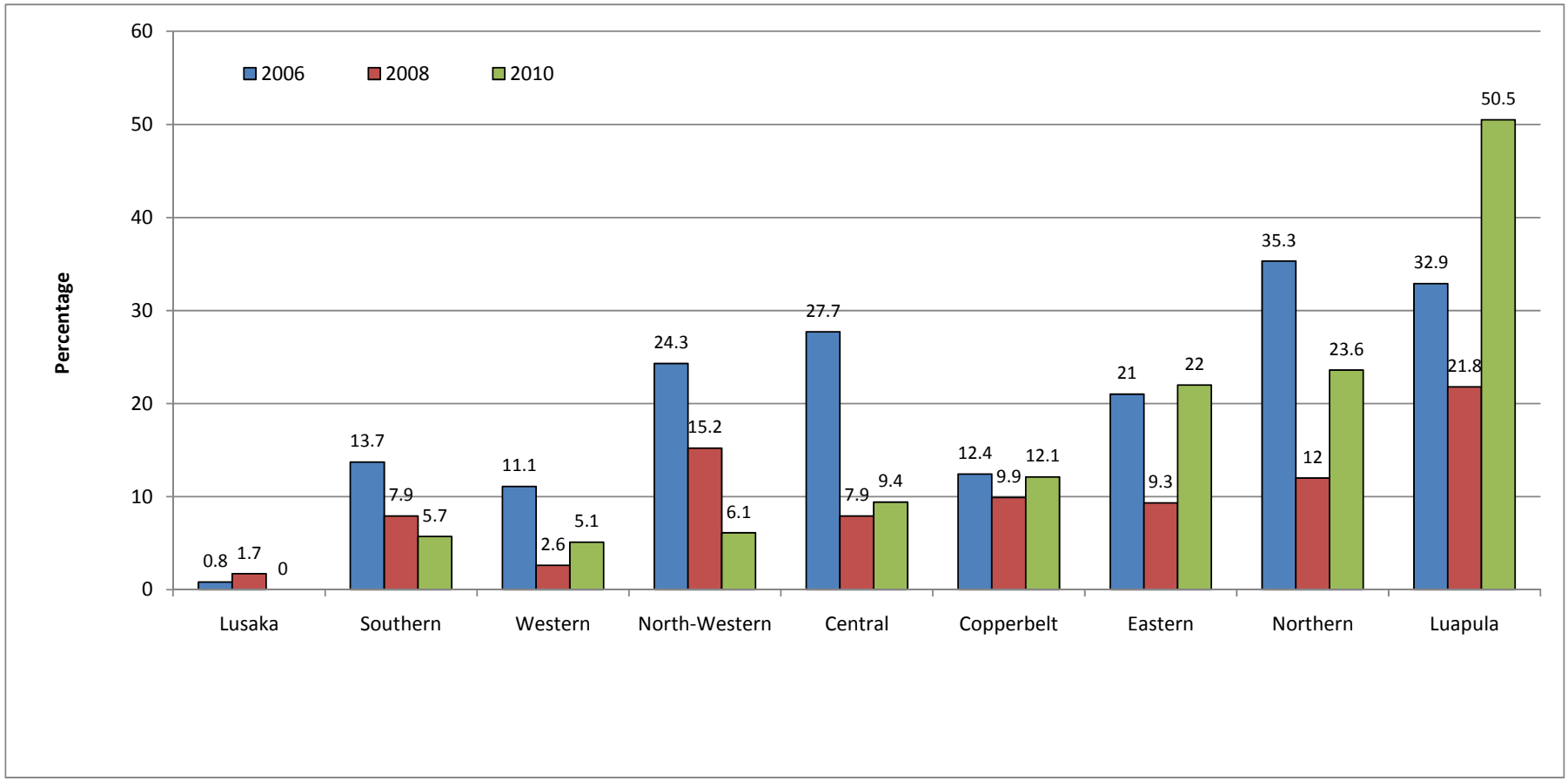
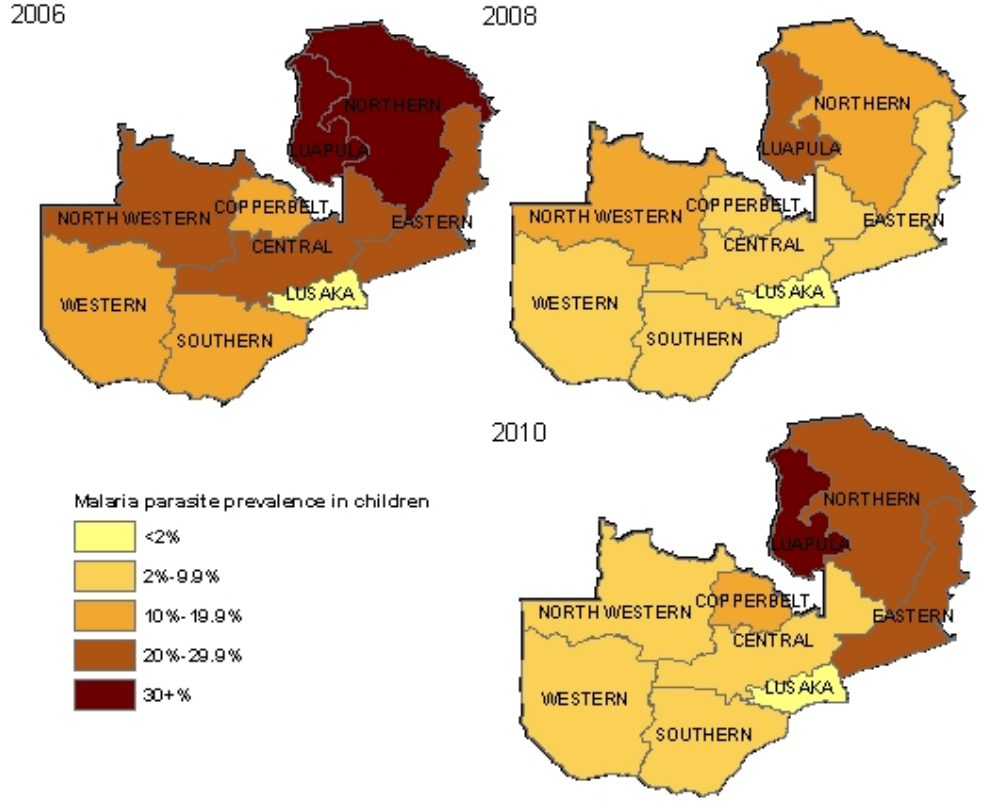


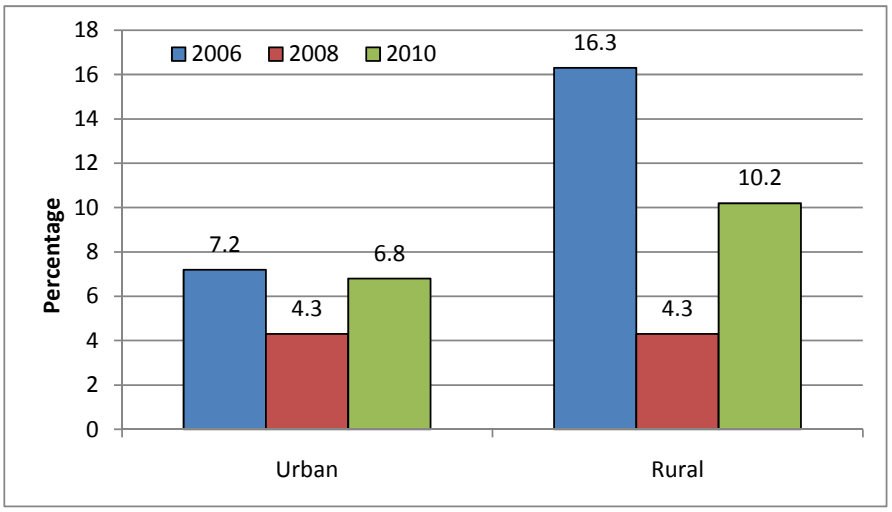
Figure 14 shows a spatial representation of malaria parasite prevalence from 2006 to 2010.

Figure 14: Percentage malaria parasite prevalence by province among children under age five years (Zambia 2006–2010).



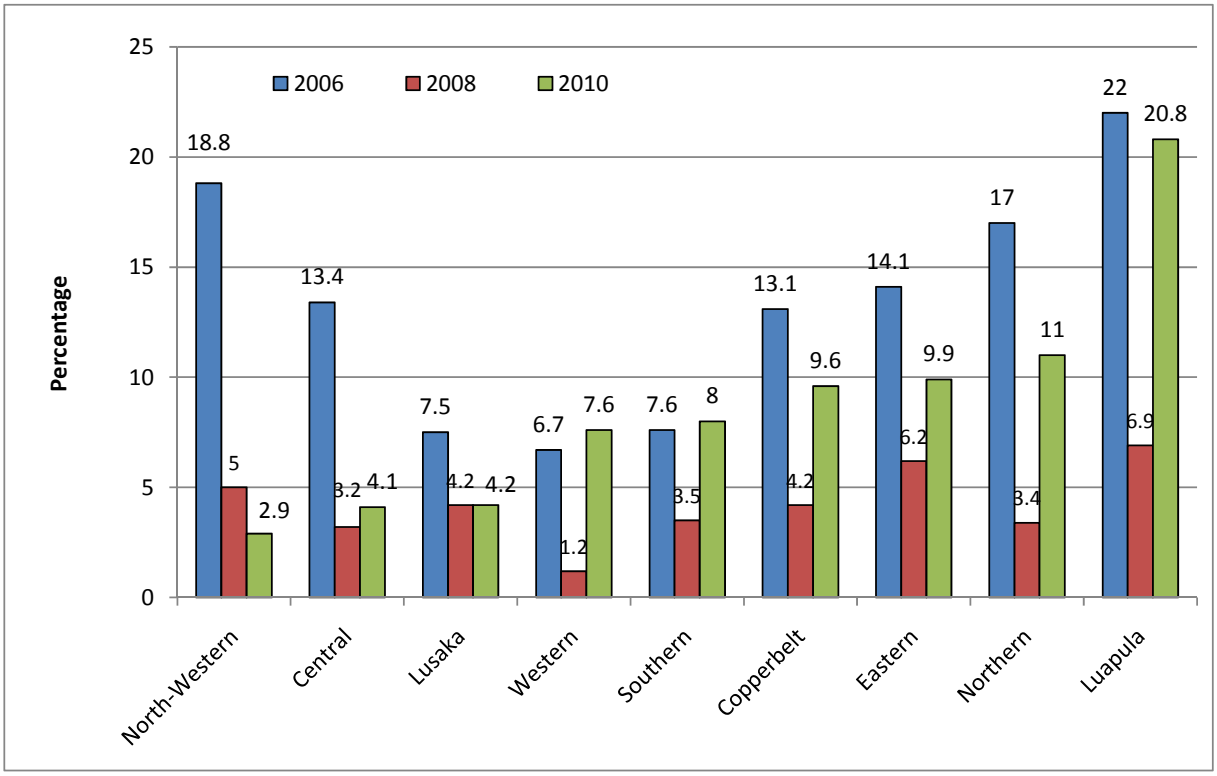
Severe anaemia prevalence has exhibited a geographic pattern similar to malaria parasite prevalence across the three surveys. Severe anaemia was much more prevalent in rural areas and despite a decrease between 2006 and 2008, both urban and rural areas reported an increase in severe anaemia between 2008 and 2010 (**Figure 15**).

Figure 15: Severe anaemia prevalence among children under age five years by urban and rural areas (Zambia 2006–2010).



North-Western and Central provinces have shown the most dramatic, consistent decreases in severe anaemia since 2006 (**Figure 16**). Apart from Lusaka and North-Western, all provinces showed an increase in severe anaemia prevalence since 2008.

Figure 16: Severe anaemia prevalence among children under age five years by province (Zambia 2006–2010).



The trends in wealth quintile (**Figure 17**) demonstrate that despite a consistent decrease in malaria parasite prevalence among children with increasing wealth status across all three surveys, the increase in 2010 in parasitaemia was predominantly borne by the poorer households. This same trend was observed in severe anaemia prevalence by wealth quintile across the three surveys (**Figure 18**).

Figure 17: Malaria parasite prevalence among children under age five years by wealth quintile (Zambia 2006–2010).

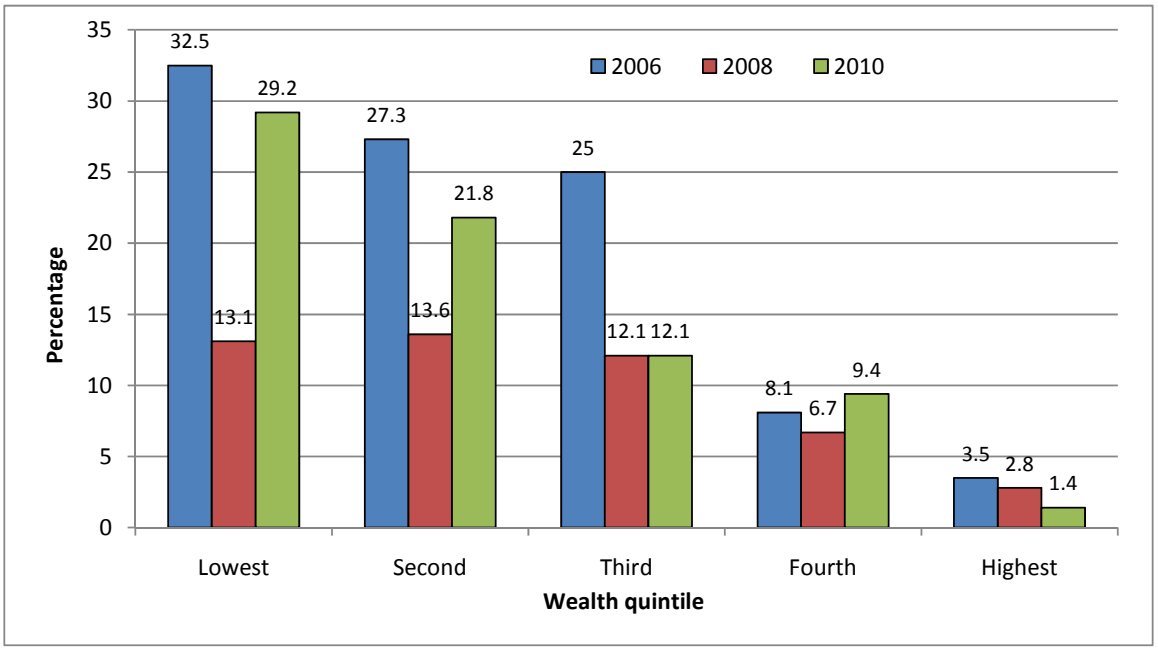
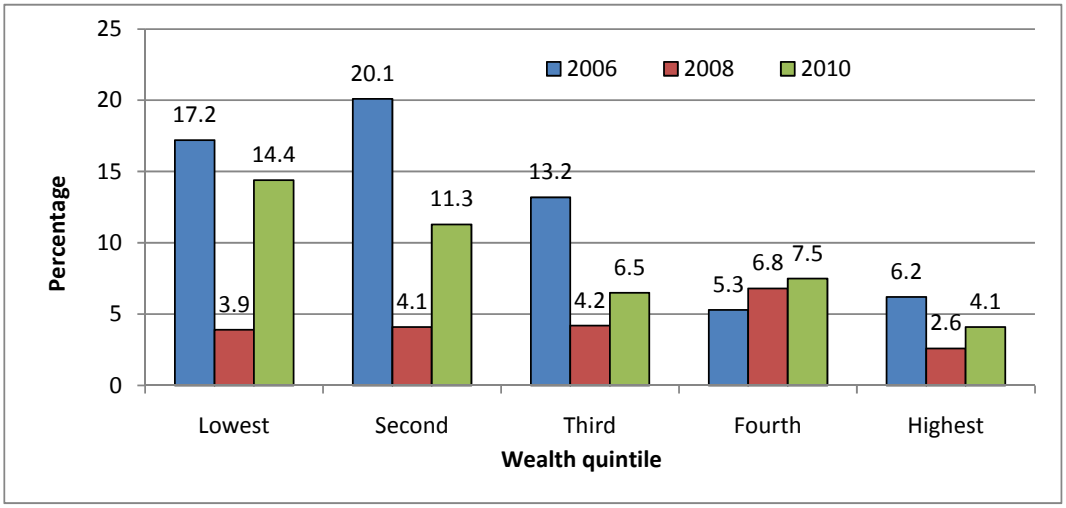


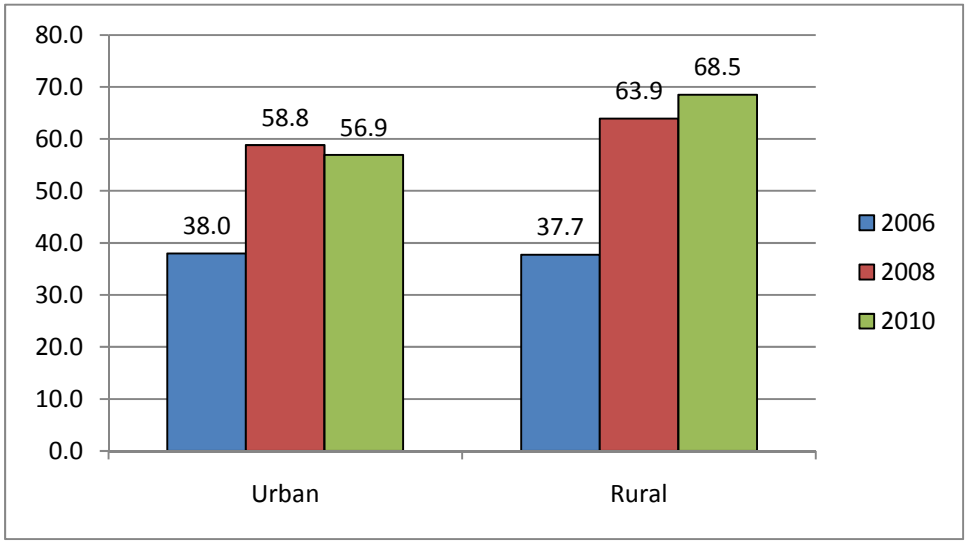
Figure 18: Severe anaemia prevalence by wealth quintile (Zambia 2006–2010).



Insecticide-treated mosquito net ownership

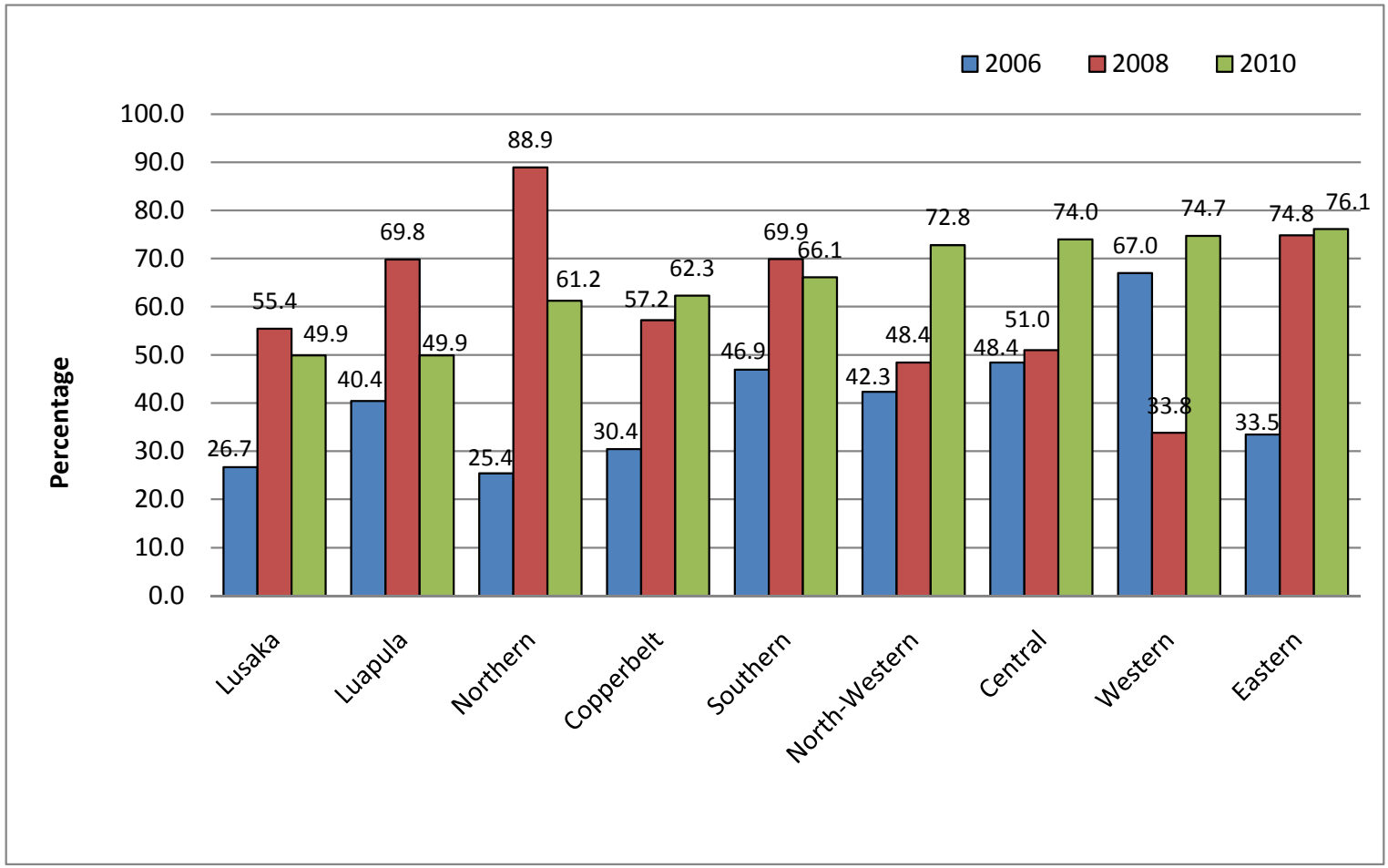
ITNs are a critical component of the malaria control programme in Zambia, serving as the primary transmission prevention intervention for rural areas where malaria is more prevalent. Since 2006, Zambia has consistently increased coverage of ITNs at the household level in rural areas with large mass distributions during late 2006 and 2007 (**Figure 19**). Despite challenges with ITN procurement during 2008 and 2009, available ITNs were prioritized for more rural areas which were not covered under IRS activities. In urban areas, despite substantial progress in increase ITN coverage between 2006 and 2008, little change occurred in urban areas between 2008 and 2010.

Figure 19: Household ownership of at least one ITN by rural and urban areas (Zambia 2006–2010).



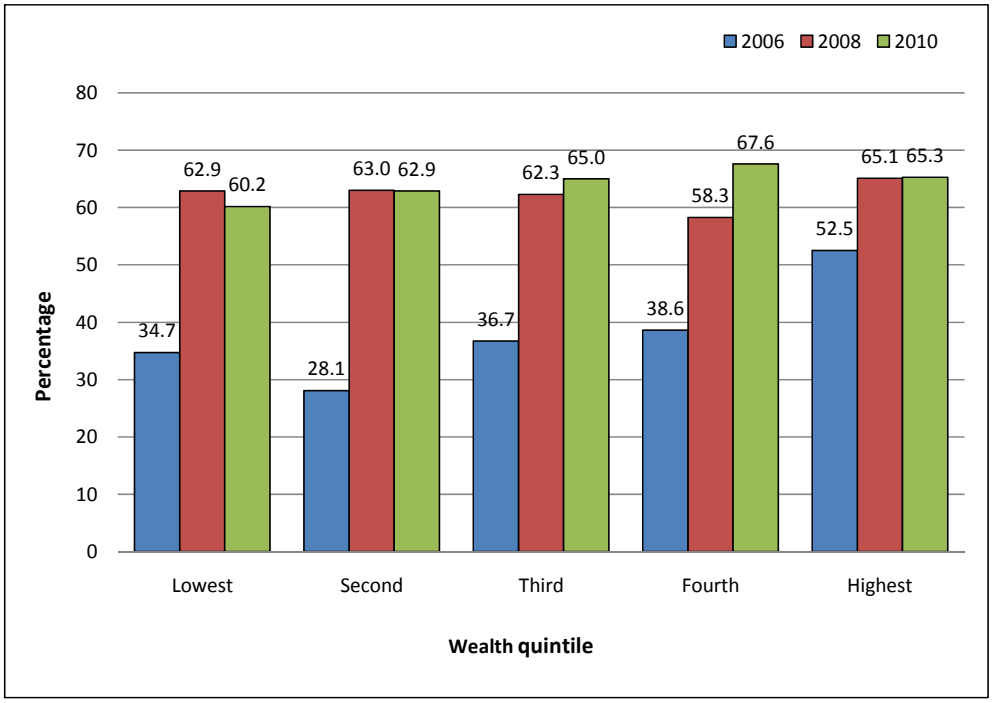
ITN ownership has varied by province in Zambia (**Figure 20**). All but two provinces have now reached 60% coverage of households with at least one ITN. North-Western, Central and Western provinces have shown the most substantial increase ITN coverage since 2008. These three provinces have benefited from recent efforts to replenish ITNs distributed during the original mass distributions from 2005 to 2006. Luapula and Northern provinces showed the greatest decline in ITN coverage. Eastern province was able to maintain coverage levels achieved in 2008.

Figure 20: Household ownership of at least one ITN by province (Zambia 2006–2010).



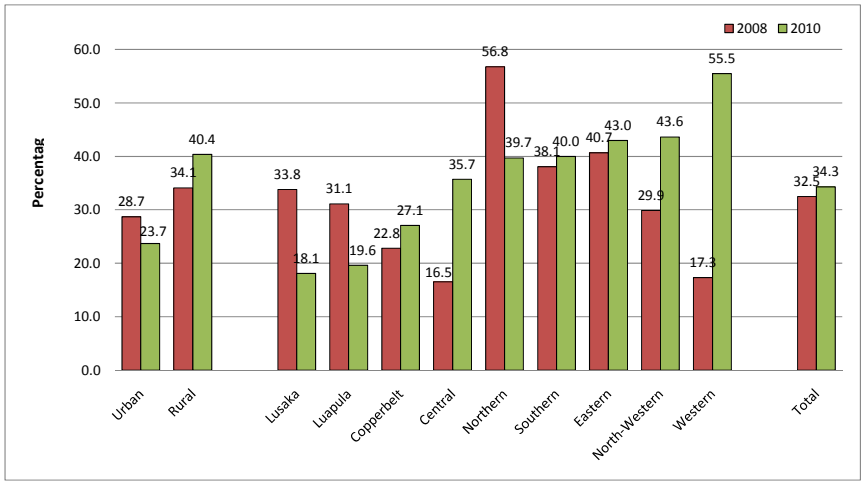
In terms of wealth quintiles, household ITN ownership has been relatively equitable between MIS 2008 and 2010 compared to results from MIS 2006 (**Figure 21**).

Figure 21: Household ownership of at least one ITN by wealth quintile (Zambia 2006–2010).



In examining trends in full coverage availability of ITNs (a one-to-one ratio of ITNs to sleeping spaces), **Figure 22** shows mixed progress across urban and rural areas as well as among the provinces, with overall improvement nationally. Rural areas since 2008 have increased full coverage overall, but urban areas have declined. Western, North-Western, and Central provinces have made substantial improvements whereas Copperbelt, Southern, and Eastern provinces made modest gains. Northern, Lusaka, and Luapula provinces showed significant decline in full coverage availability since 2008.

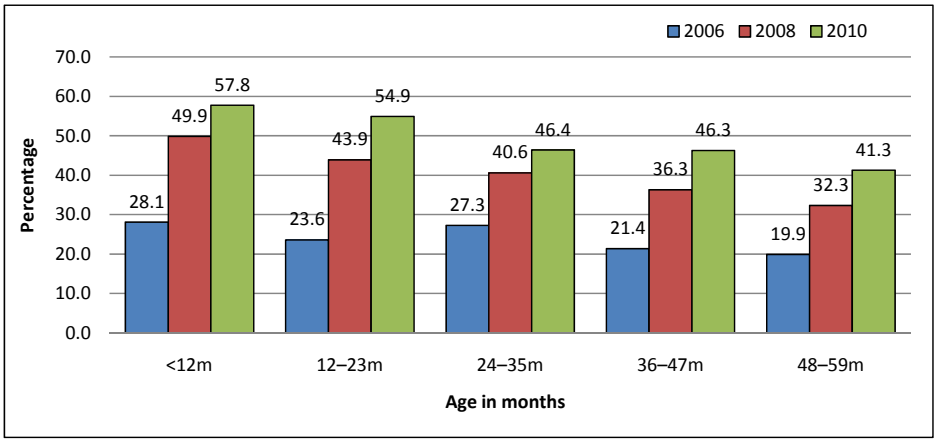
Figure 22: Percentage of households with an ITN to sleeping space ratio of least one-to-one (Zambia 2008–2010).



Insecticide-treated mosquito net use

ITN use among Zambian children is increasing. Sustained increases in ITN use have occurred particularly in the younger children compared to older children between 2006 and 2010 (**Figure 23**).

Figure 23: ITN use by children under age five years by age (Zambia 2006–2010).



Since 2006, ITN usage among children under age five years has been higher in rural settings (**Figure 24**). Usage rates increased from 2006 to 2008 and from 2008 to 2010. This trend became more pronounced in rural areas by 2010.

Figure 24: ITN use by children under age five years by rural and urban areas (Zambia 2006–2010).

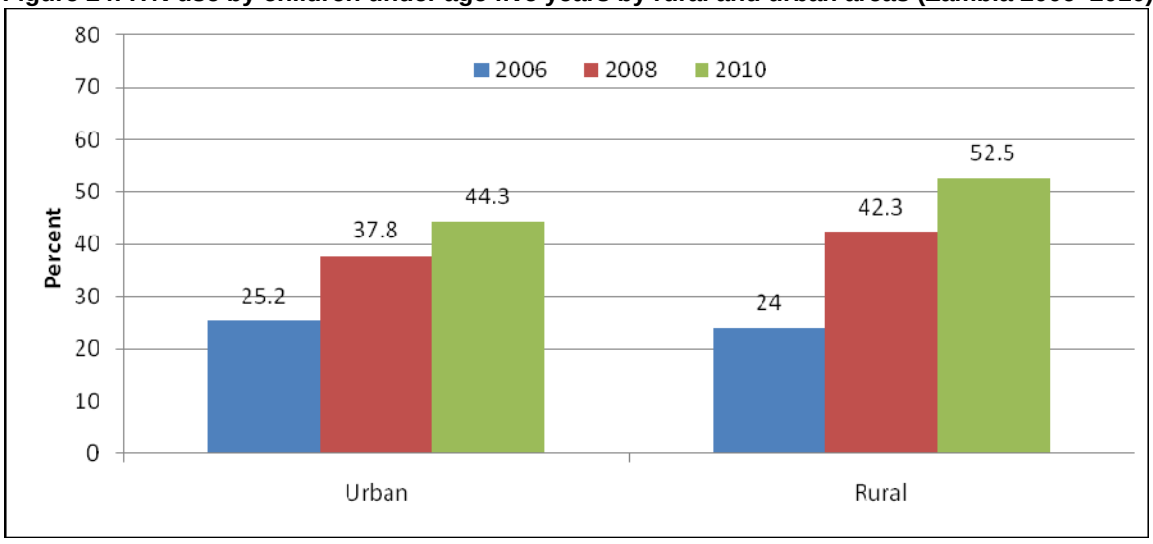


Figure 25 shows that ITN use among children varied by province since 2006. ITN usage in Lusaka, Luapula, and Northern provinces declined from 2008 to 2010 whereas all other provinces reported an increase in ITN use among children from 2008 to 2010. Five of the nine Zambian provinces reported at least 50% of children sleeping under an ITN by 2010.

Figure 25: ITN use by children under age five years by province (Zambia 2006–2010).

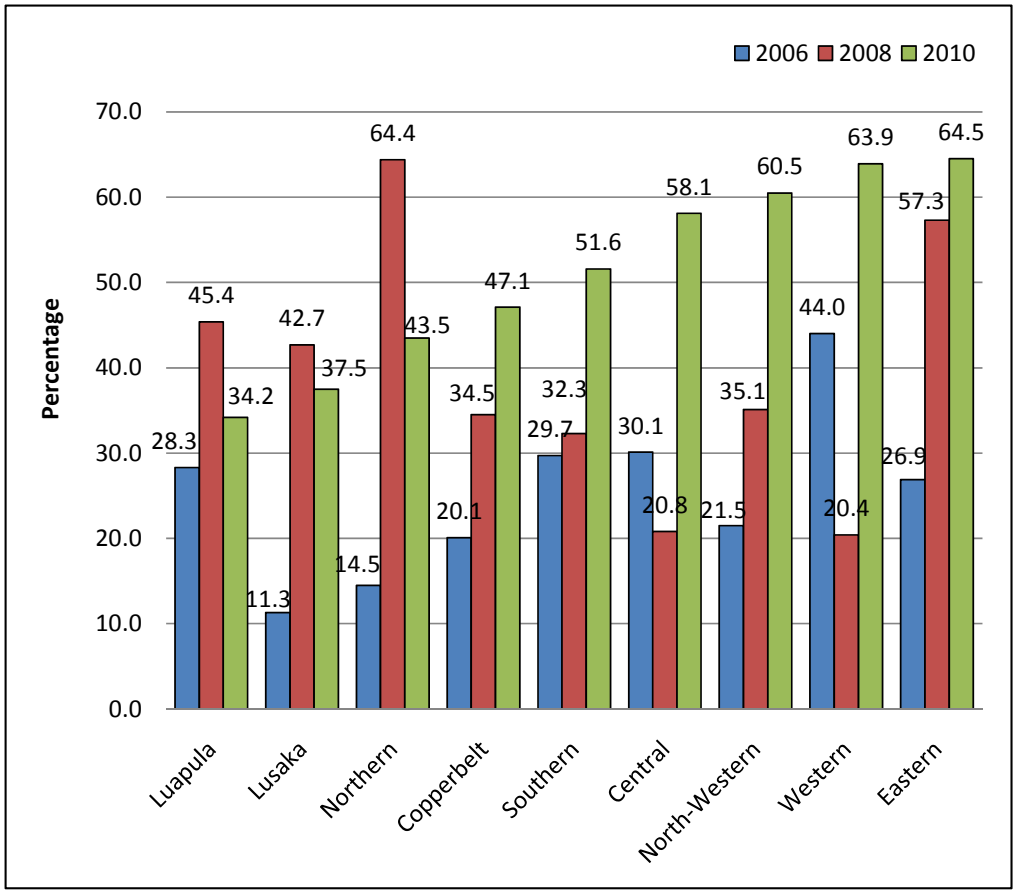
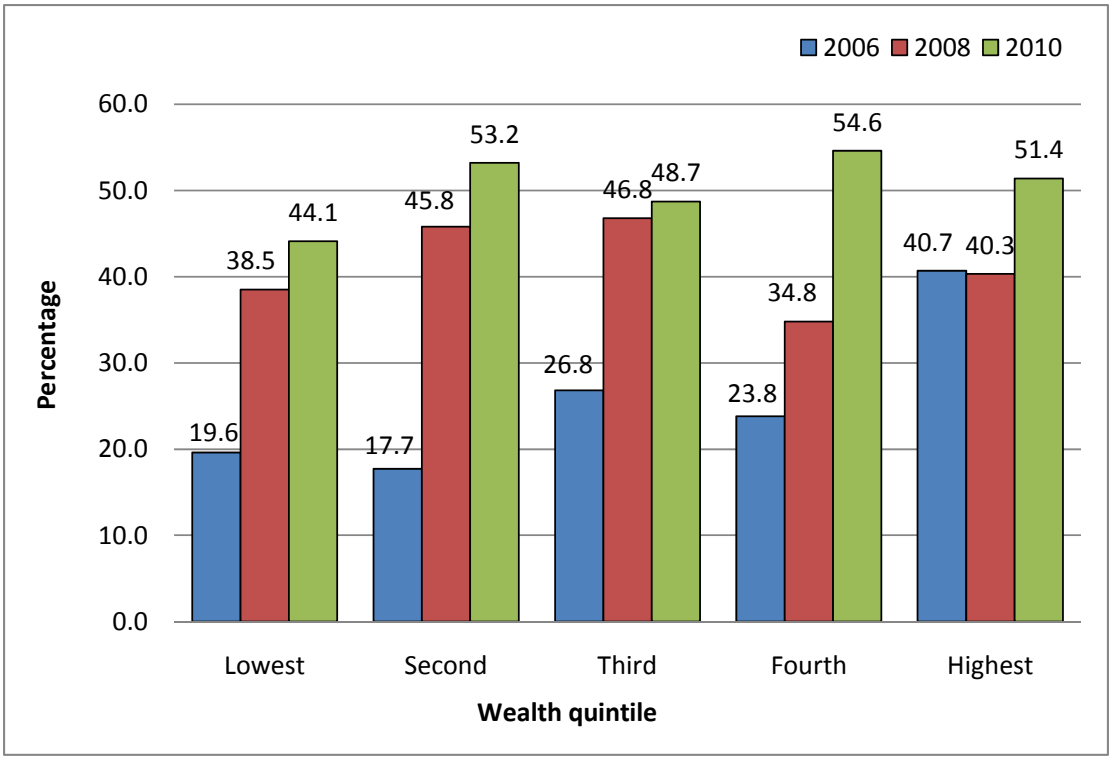


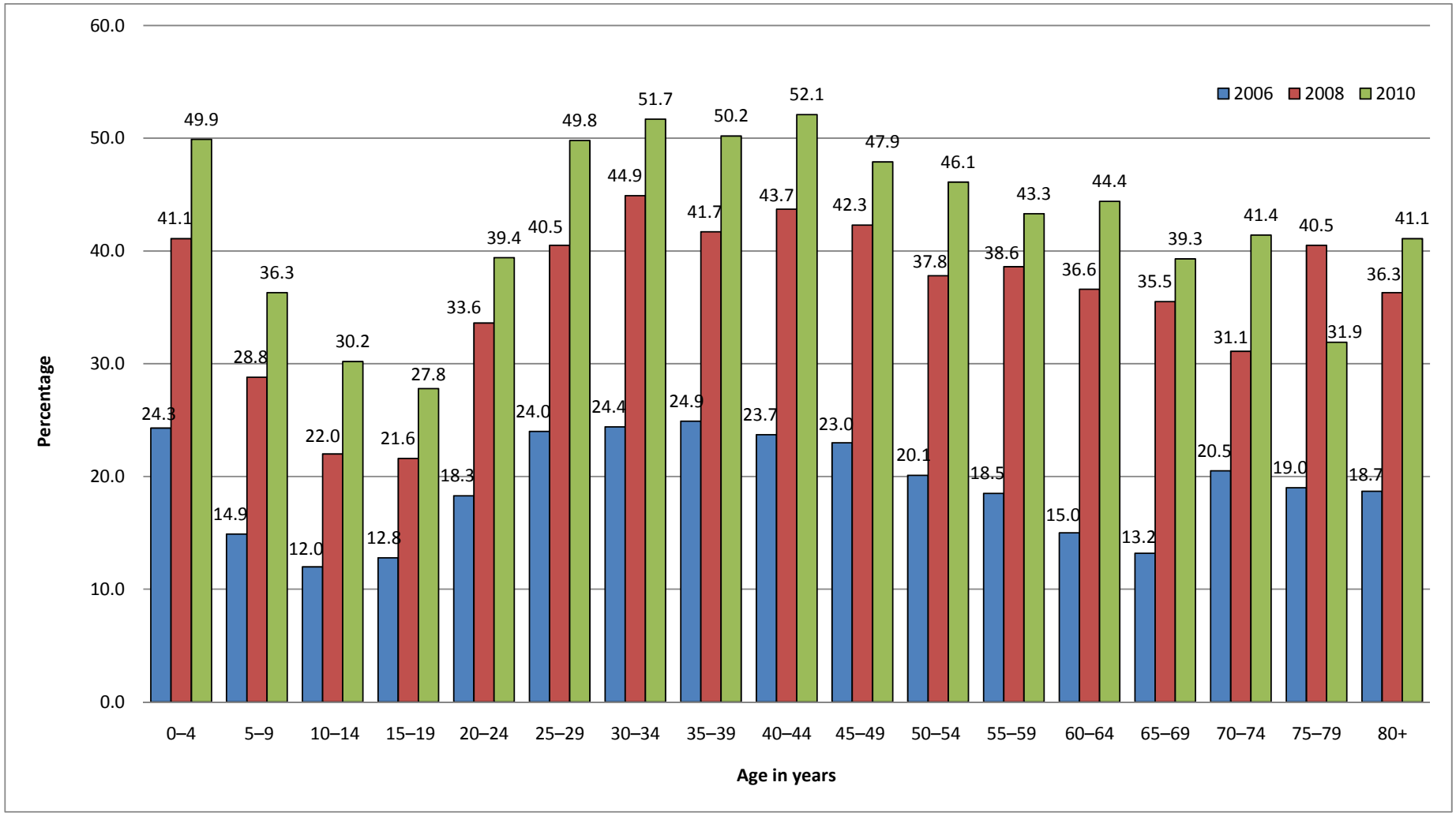
Figure 26 shows ITN use by wealth quintile. Results from the 2006, 2008, and 2010 MISs show that ITN use was initially higher in the highest wealth quintile than in lowest quintile. However, this disparity reduced between 2008 and 2010.

Figure 26: ITN use by children under age five years by wealth quintile (Zambia 2006–2010).



Among all household members, **Figure 27** presents the trends, by age category, in ITN use the night before the survey. Age trends in ITN use were consistent across all three surveys and increased steadily across almost all age groups during this period. Older children and young adults showed the lowest percentage of ITN use whereas young children and adults between ages 25 and 49 reported the highest levels of ITN use. The overall use of ITNs among household members increased from 18.9% in 2006, to 34.1% in 2008, to 42.0% in 2010.

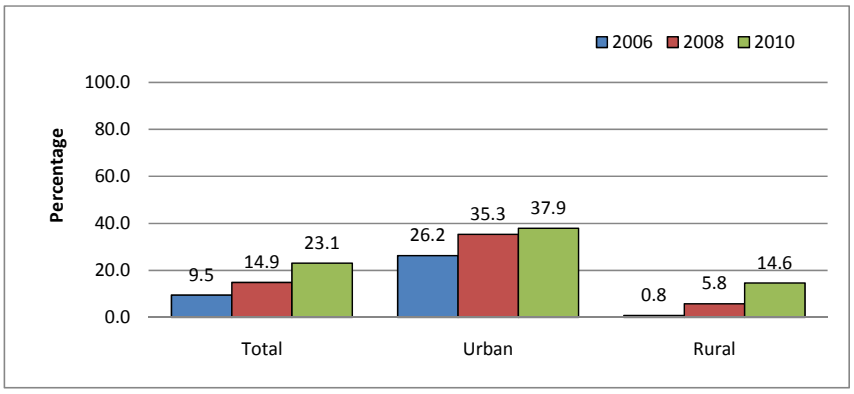
Figure 27: ITN use among household members by age group (Zambia 2006–2010).



Indoor residual spraying

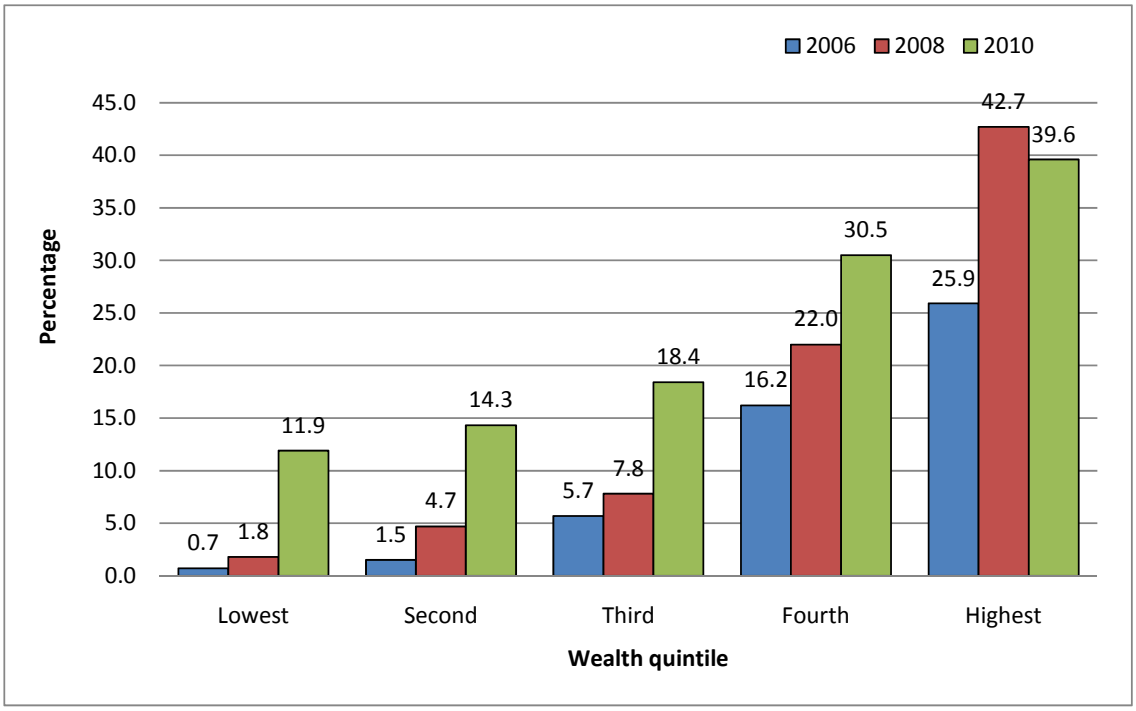
Over the last several years, Zambia has increased the number of districts where IRS is deployed—from 15 districts in 2005–2006 to 36 districts during the recently completed spray season in 2009. IRS activities continue to expand within existing spray districts as well as to additional districts as funding allows. Although IRS initially was targeted toward urban and peri-urban areas of selected districts, since 2007 an increasing amount of rural areas have also been sprayed. Nationally, reported IRS coverage rates have increased from 9.5% in 2006 to 23.1% in 2010 (**Figure 28**). This increase is most obvious in rural areas where in 2006, very few rural households reported spraying, but by 2010, nearly 15% of households reported spraying.

Figure 28: Households reported sprayed within the previous 12 months (Zambia 2006–2010).



IRS activities have been targeted toward urban and peri-urban areas. When an asset-based wealth index is considered, IRS tends to target wealthier households in urban and peri-urban areas as opposed to poorer more rural households with fewer assets **(Figure 29)**. Between 2006 and 2010, this divide began to reduce slightly as more rural households were included under the spray operations in several districts. The ratio of the reported coverage of IRS between the wealthiest households and the poorest households dropped from 37 in 2006 down to 3.3 in 2010.

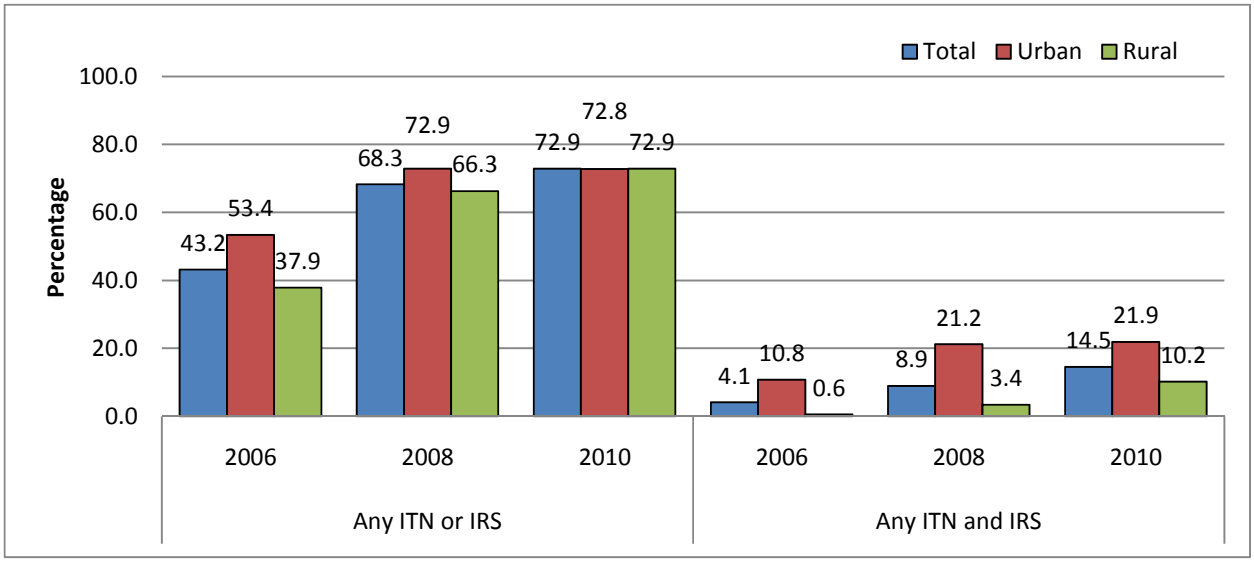
Figure 29: Households reported sprayed within the previous 12 months (Zambia 2006–2010).



Copperbelt Province reported a change in the proportion of sprayed households that were sprayed by public sector versus private agents. That is, in 2008 and 2010, 66% and 78%, respectively, were sprayed by public sector entities and 28% and 18% respectively were sprayed by private agents. This suggests a shift away from private spraying and that some of the decrease in coverage in Copperbelt may be explained by the lower rates of spraying by private agents.

Combining available interventions to further reduce malaria burden is an emerging issue for the NMCP as interventions continue to be scaled up and sustained. The coverage of either ITNs or IRS as well as the combined coverage of both ITNs and IRS at the household level is presented in **Figure 30** from 2006 to 2010. In 2006, 43.2% of households reported having either an ITN or IRS. This increased to 72.9% by 2010. For households reporting having both at least one ITN *and* their house sprayed, the percentage increase from 4.1% in 2006, to 8.9% in 2008, and finally to 14.5% in 2010. This increase in the availability of both interventions was more dramatic in rural households, mainly due to the expansion of IRS services into rural areas since 2008.

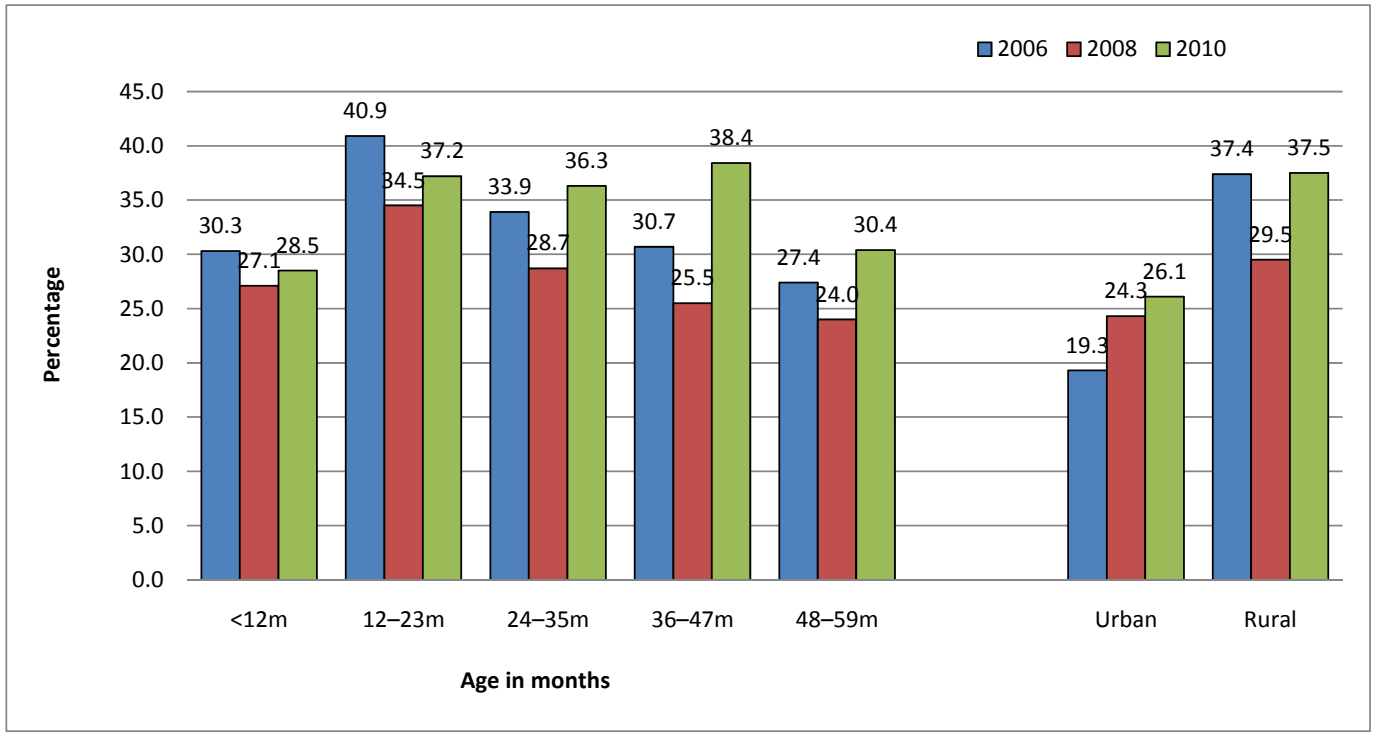
Figure 30: Households reporting either at least one ITN or house sprayed or both (Zambia 2006–2010).



Fever seeking behaviour and antimalarial treatment

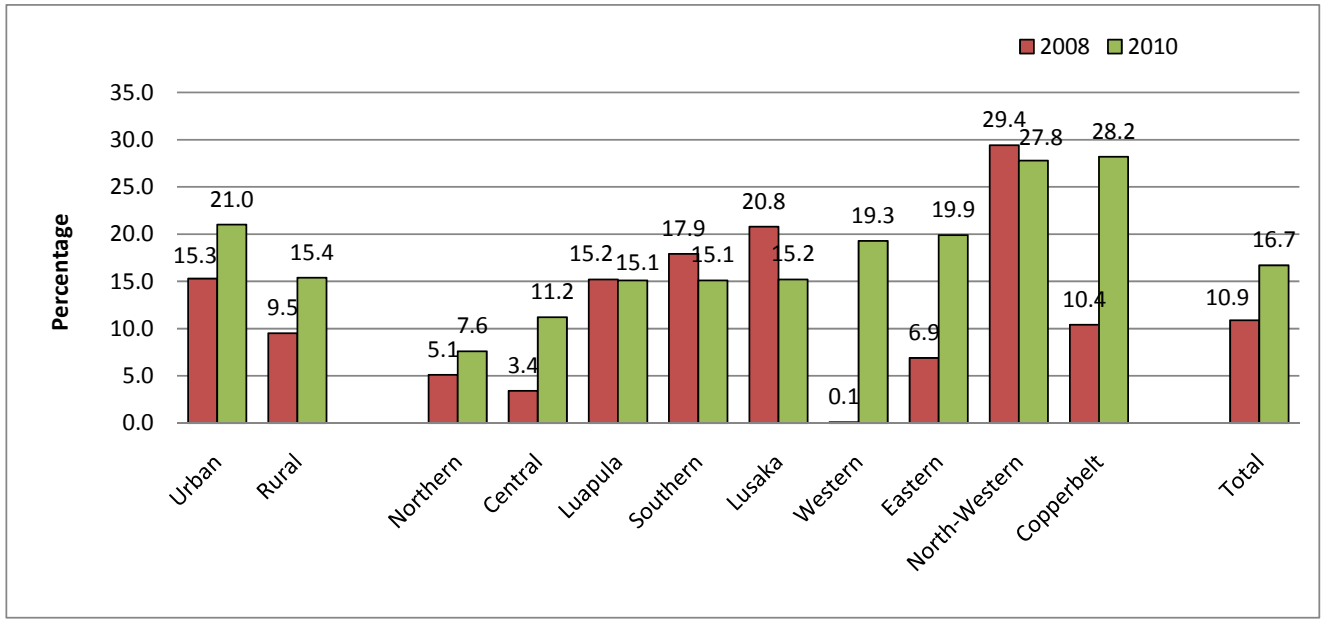
Fever prevalence among children under age five years fluctuated throughout the surveys conducted from 2006-2010. **Figure 31** represents fever prevalence among children during the two weeks preceding the survey by age and urban and rural areas. The trend in fever prevalence follows a similar pattern to malaria prevalence among children under five years by age with initial lower levels among those less than one and then peaking by age two and then a steady decline after. The most recent findings reflected an increase in fever prevalence in 2010.

Figure 31: Fever prevalence with the preceding two weeks among children under age five years (Zambia 2006–2010).



Since 2008, MISs have asked questions on the prevalence of finger sticks for febrile children who sought care for fever. This can provide some insight in the availability of diagnostic testing services and thus parasitologic confirmation for children with malaria symptoms. **Figure 32** shows that the percentage of febrile children receiving finger sticks during care-seeking increased from 2008 to 2010; this increase was seen in rural and urban areas. Copperbelt, Eastern, Central, Western provinces all reported large increases in the percentage of febrile children receiving finger sticks, while Lusaka and Southern provinces reported declines. While it is difficult to ascertain facility-level clinical practices from household surveys, it is assumed that much of the finger sticks are likely malaria RDTs which have been scaled up throughout the country since 2007.

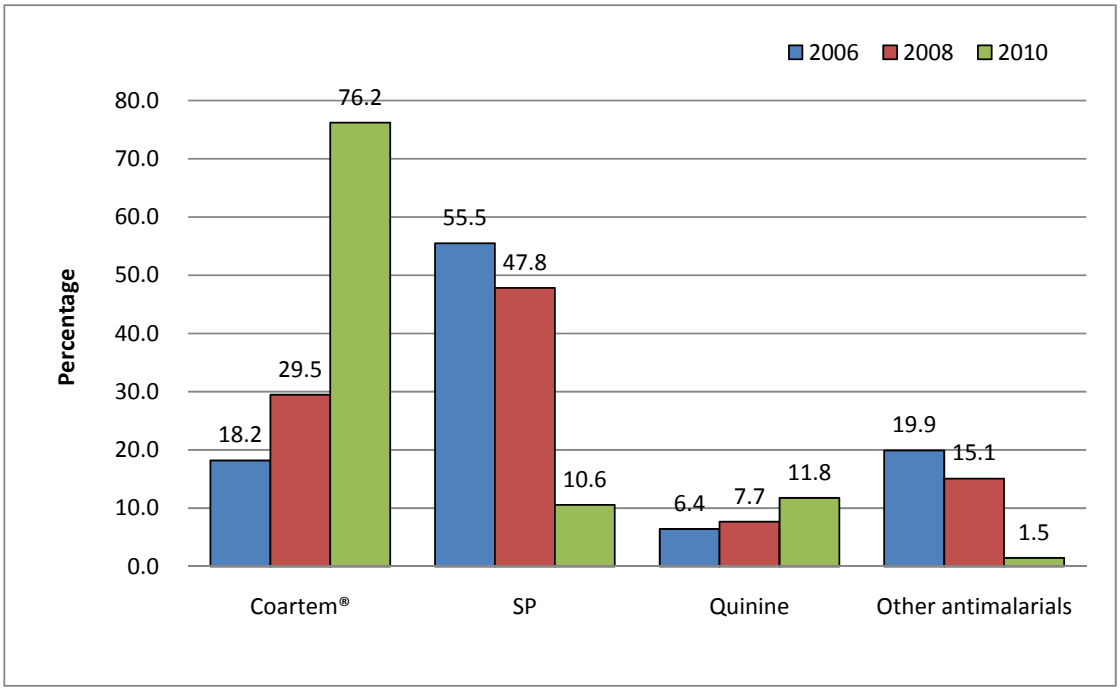
Figure 32: Percentage of febrile children under age five years with a reported finger stick for presumed diagnostic testing services and parasitologic confirmation (Zambia 2008–2010).



Antimalarial treatment practices among febrile children have also shown dramatic changes since 2006. Overall treatment of febrile children with antimalarial drugs has declined from 52.8% in 2006, to 43.1% in 2008, to 34% in 2010. Due to the increasing availability of malaria RDTs, it is assumed that declining percentage of antimalarial treatments offered to children with fever is largely a result of health care providers offering more appropriate treatment advice as a result of parasitological confirmation of clinical diagnoses. The MOH has reported dramatic reductions in malaria that result from the role of RDTs and the subsequent change in malaria case definition being applied in health facilities for outpatient attendances (MOH 2010). Fewer patients with symptomatic fever are being given antimalarial drugs in part because RDT results indicate that they do not have malaria.

Also encouraging is the trend in percentage of recommended antimalarial treatments taken among all antimalarials taken for febrile episodes. **Figure 33** shows that Coartem®, the brand of ART-LUM which is exclusively used for first-line treatment of malaria in Zambia, has steadily increased as the antimalaria drug most often taken for febrile children. This has largely been at the expense of SP which has shown consistent declines, but most dramatically since 2008. That this is also evident despite declining antimalarial treatment rates is even more encouraging. The use of other antimalarials, which included any antimalarial medicines such as artemisinin monotherapies, was reduced to negligible amounts by 2010.

Figure 33: Among febrile children taking antimalarial, the percentage of antimalarial drug taken (Zambia 2006–2010).



Malaria knowledge and sources of malaria information

Understanding and influencing knowledge and behaviour about malaria and the importance of malaria interventions at the household level is a critical component to the national malaria control programme. Since 2008, various aspects of malaria knowledge, communication strategies, and malaria messaging have been measured in MISs. For example, nearly all women surveyed in 2008 and 2010 have heard of malaria (99.9% and 99.3%, respectively). Slightly more women interviewed in 2010 reported fever as symptom of malaria than in 2008 (75.3% and 71.1%, respectively). Use of mosquito nets or ITNs have consistently been reported most often as a malaria prevention method in 2008 and 2010, and this is confirmed by use of ITNs as the most often cited malaria message in 2008 and 2010 that women have heard through various communication channels.

Conclusions

The Zambia National Malaria Indicator Survey 2010 builds on more than five years of focused measurement activities to document progress toward the 2006–2010 NMSP. These include three national MISs to benchmark the successes and challenges in controlling malaria in throughout the country. Based on these findings several conclusions can be drawn.

From 2006 to 2008, Zambia demonstrated remarkable progress in scaling up intervention coverage and in reducing the burden of malaria parasitaemia and anaemia. This was evident in particular with the rollout of ITNs to several provinces, primarily through ANCs and through mass distribution. Coverage and use of ITNs increased dramatically during this period in most areas of the country. IRS activities also improved nationally, especially in urban and peri-urban areas.

Between 2008 and 2010, Zambia experienced a resurgence of malaria and severe anaemia—most notable in three provinces: Eastern, Luapula, and Northern. There was essentially no, or very little, increase in the other six provinces (Central, Copperbelt, Lusaka, North-Western, Western, or Southern). The increase in Eastern, Luapula and Northern provinces may have had several contributing factors and these may have been different in the different provinces. North-Western and Southern provinces continued to show reductions in malaria parasitaemia between 2008 and 2010.

In Northern and Luapula provinces, there were marked drops in household ownership and use of ITNs between 2008 and 2010 (31% and 29% reductions, respectively); this alone could account for much of the increase in malaria and severe anaemia. In Eastern Province, ITN availability remained largely unchanged at the provincial level. Similarly, reported ITN use by children under age five years the night before the survey decreased dramatically in Northern and Luapula provinces—dropping by 33% and 25%, respectively, and in Luapula only 34% of children under five years of age slept under an ITN the previous night. All other provinces apart from Lusaka saw increasing numbers and rates of children sleeping under an ITN.

In Copperbelt Province, where urban and peri-urban populations are large and where IRS has been an important preventive intervention, ITN distribution and use was not prioritized due to overall constraints in ITN procurements and supply relative to the rest of the country. Compared to 2008, in 2010 a lower proportion of households were sprayed (16% reduction between 2008 and 2010; and only 45% of households reporting IRS spraying). Of note, the proportion of spraying by private agents dropped from 28% in 2008 to 18% 2010. Much of the decrease in IRS, therefore, may be attributed to a decrease seen private spraying.

Overall, IRS activities have expanded into more rural malarious areas of the country and more districts will be receiving IRS in the latter part of 2010. Combined ITN and IRS coverage continues to expand. The majority of available ITNs in the country were LLINs and were recorded as such in the MISs due to how their brands are recognized by field staff and household members. A possible contributing factor to the increase in parasitaemia relative to ITN coverage is that LLIN efficacy declines over time despite still being classed, for reporting purposes, as ITNs. The majority of ITNs reported in the survey were LLINs. This would likely have affected the majority of provinces, including Eastern, Northern, and Luapula provinces, where malaria parasitaemia increased between 2008 and 2010 where large influxes of new ITNs did not occur. Provinces which received the majority of ITN distributions between 2008 and 2010 recorded decreased or similar levels of parasitaemia between 2008 and 2010. These included Central, North Western, and Western Province.

Overall, treatment with Coartem® has improved greatly since 2008 with more febrile children receiving Coartem® than any other antimalarial drug. Further, as malaria case definitions in facilities change to reflect the use of either RDTs or microscopy, one would expect the treatment patterns to alter with antimalarial drugs being prescribed less frequently for febrile illness. Understanding the

types of diagnostics used will become an increasingly important issue for interpreting household-reported antimalarial treatment practices.

In summary, the current interpretation of the MISs suggests the following recommendations for the national malaria control efforts:

1. Re-establish high ITN ownership and use in Luapula and Northern provinces and encourage continued ITN uptake among all households and household members, especially in Eastern Province. This is an urgent requirement.
2. Explore and address the reasons for the stabilization of malaria rates in Copperbelt Province (by examining issues such as IRS coverage, choice of insecticide, ITN coverage and use). In the near term, an emphasis on increasing ITN coverage and use in the Copperbelt might be the most important for the coming transmission season.
3. Expand case management, including diagnostics for parasitologic confirmation of suspected malaria cases, and consider that screening populations and treating those with infection may be important to further curtail malaria transmission. This latter effort would be especially appropriate in areas with continued and persistent high levels of malaria parasitaemia and transmission to supplement existing malaria prevention interventions.
4. Attend to the other provinces (Lusaka, Central, Southern, Western, and North-Western) to assure that their current coverage and use with malaria prevention interventions remains high. This is an important need so that they do not find themselves with resurgent malaria during the next transmission season.

A number of additional external factors, such as climatic or vector dynamics, may have also contributed to the resurgence of malaria parasitaemia seen in a few areas. Still, it is incumbent on partners to continue to work together in support of the national programme to ensure the needed commodities are swiftly procured and delivered to districts. We must be prepared well in advance of the next malaria transmission season which begins in November and December of 2010.

Additional Resources

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Appendix A: Sample design

Introduction

The Malaria Indicator Survey (MIS) 2010, like previous surveys, covered household population in Zambia. A representative probability sample to produce estimates for the country as a whole, rural and urban separately, and for the new IRS rural areas combined as one domain is drawn. Overall a representative probability sample of 4500 households is selected for the 2010 MIS.

Sampling frame and stratification

Zambia is administratively divided into nine provinces, and each province is in turn subdivided into districts. For statistical purposes each district is subdivided into Census Supervisory Areas (CSAs) and these are in turn subdivided into Standard Enumeration Areas (SEAs). The 1998–2000 mapping exercise in preparation for the 2000 census of population and housing demarcated the CSAs within wards, wards within constituencies, and constituencies within districts. In total, Zambia has 72 districts; 150 constituencies; 1,289 wards; about 4,400 CSAs; and about 17,000 SEAs. The listing of SEAs has information on the number of households and the population. The number of households was used as a measure of size for selecting primary sampling units. Therefore, the sample frame of this survey is the list of SEAs developed from the 2000 Population Census.

The SEAs are also stratified by urban and rural designations.

Sample allocation and selection

The 4500 households were initially allocated between rural, urban, and the IRS in proportion to the population of each domain according to the 2000 census results. Adjustments to the proportional distribution were made to allow for reasonable comparison between strata or domains.

The distribution is given in **Table A.1** below:

Table A.1: Sample allocation of households and clusters

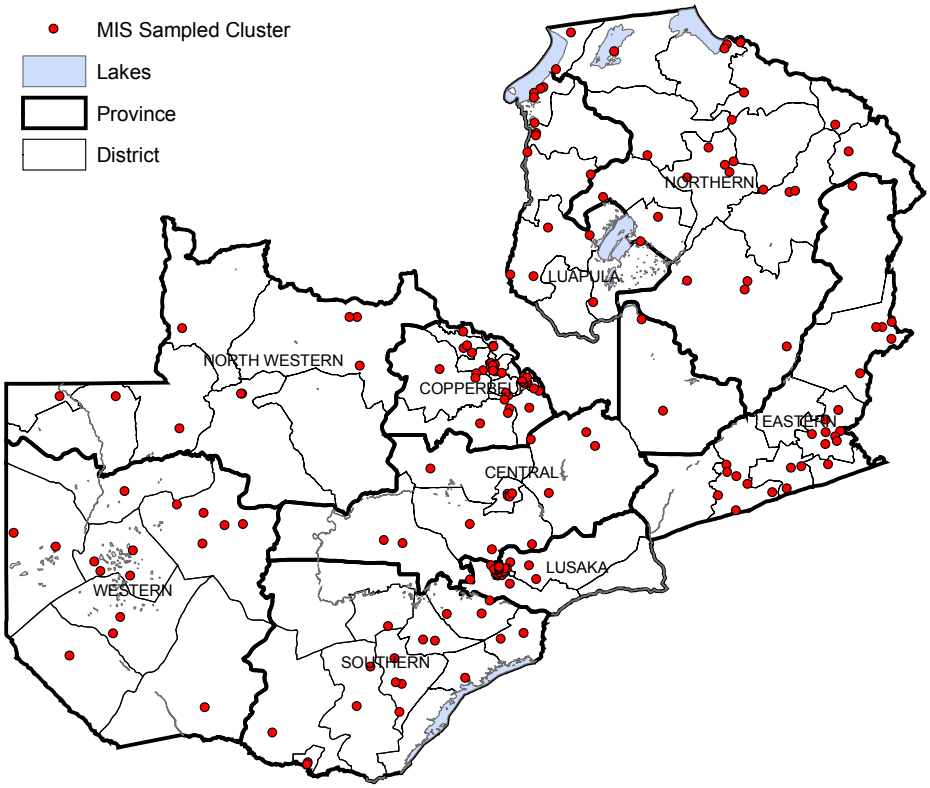
Domain	Proportion of households based on 2000 Census frame	Proportional allocation of sample households	Adjusted sample households	Number of clusters
IRS over sample	0.08	362	700	28
Rural	0.58	2,624.5	2,275	91
Urban	0.34	1,538.5	1,525	61
Total	1	4,525	4,500	180

The MIS sample was selected using a stratified two-stage cluster design. Once the households were allocated to the different strata, the number of clusters (SEAs) to be selected were calculated based on an average cluster take of 25 completed interviews of all respondents. Clusters were selected systematically with probability proportional to the number of households. **Table A.2** shows the distribution of sample clusters by province. A map of the location of sample clusters appears in **Figure A1**.

Table A.2: Distribution of sample clusters by province and domain

Province	Total clusters	IRS Areas	Rural	Urban
Central	17	2	10	5
Copperbelt	31	7	4	20
Eastern	25	7	16	2
Luapula	16	2	12	2
Lusaka	25	-	4	21
Northern	24	4	17	3
North-Western	9	-	7	2
Southern	17	1	12	4
Western	16	5	9	2
Total	**180**	**28**	**91**	**61**

Figure A.1: Sample clusters included Zambia MIS 2010.



Selection of clusters

The following steps were used to select the clusters (SEAs) in each stratum:

(i) Calculate the sampling interval, *I*, for each stratum

$$I_h = \frac{\sum_{i=1}^{N_h} M_{hi}}{a_h}$$

where M_{hi} is the number of households in SEA (or cluster) *i* and stratum *h*,

$\sum_{i=1}^{N_h} M_{hi}$ is the size of the stratum (total number of households in the stratum according to the 2000 census) and *a* is the number of clusters (SEAs) to be selected in the stratum.

(ii) Calculate the cumulated size of each SEA.

(iii) Calculate the sampling numbers

$$R, R+I, R+2I, ..., R + (a-1)I,$$

where R is a random number between 1 and *I*.

(iv) Compare each sampling number with the cumulated sizes of the SEAs.

The first SEA (or cluster) whose cumulated size is equal to or greater than the random number generated in (iii) was selected. The next SEA to be selected was the one with cumulated size equal to or greater than *R+I.* Each of the rest of the SEAs were selected using the same procedure, making sure to add *I* at each subsequent selection.

Selection of households

A frame of households was determined by listing all the households in all the selected SEAs. Upon completion of household listing, the household lists were given new household numbers, which were sampling serial numbers assigned to each household in the cluster. The sampling numbers were assigned sequentially within each SEA starting from 1. The total number of households in the SEA was equal to the last serial number assigned.

In summary, the following steps were used to select the households:

1. Calculate the sampling interval for each category

$$I = \frac{B}{b}$$

where *B* is the number of households listed in the selected SEA and *b* is the number of households to be selected in that SEA.

2. Generate a random number (R) between 1 and the interval *I*; the first selection will hence be R.
3. Add the interval to the random number to get the next selection.
4. Add the interval repeatedly until you get your desired sample size.

Estimation procedure

Weights

Due to the disproportional allocation of the sample to the different strata, sampling weights were required to ensure that the sample was representative at the national level. The sampling probabilities at first-stage selection of SEAs and probabilities of selecting the households were used to calculate the weights. The weights of the sample were equal to the inverse of the probability of selection.

The probability of selecting cluster *i* was calculated as

$$P_{hi} = \frac{a_h M_{hi}}{\sum_{i=1}^{N_h} M_{hi}}.$$

The weight or boosting factor is, thus, given as

$$w_{hi} = \frac{1}{P_{hi}}$$

where: P_{hi} is the first-stage sampling probability of (SEA), a_h is the number of SEAs selected in stratum h, M_{hi} is the size (households according to the census frame) of the i^{th} SEA in stratum h, and ΣM_{hi} is the total size of stratum h.

The selection probability of the household was calculated as:

$$p_h = \frac{n_h}{N_h}$$

where n_h is the number of households selected from stratum h and N_h is the total number of households in stratum h.

Let y_{hij} be an observation on variable y for the j^{th} household in the i^{th} SEA of the h^{th} stratum. Then the estimated total for the h^{-th} stratum is:

$$y_h = \sum_{i=1}^{a_h} \sum_{j=1}^{n_h} w_{hi} y_{hij}$$

where, y_h is the estimated total for the h^{th} stratum., w_{hi} is the weight for the j^{th} household in the I^{th} SEA of the h^{th} stratum, i=1-a_h is the number of selected clusters in the stratum, and j=1-n_h is the number of sample households in the stratum. The national estimate is given by:

$$y = \sum_{h=1}^{H} y_h$$

where y is the national estimate, h=1, H is the total number of strata. For this survey, H = 3 (the rural/urban and the IRS areas taken as a separate domains).

Table A.3: Number of interviews and response rates: household and women's sample

Result	Residence		Total
	Urban	Rural	
Household Interviews			
Selected households	1,525	2,975	4,500
Occupied households	1,518	2,967	4,485
Interviewed households	1,477	2,884	4,361
Household response rate (HRR)	97.3%	97.2%	97.2%
Interviews with women			
Number of eligible women	1,797	2,630	4,427
Number of eligible women interviewed	1,523	2,442	3,965
Eligible women response rate	84.8%	92.9%	89.6%

Appendix B: Survey personnel

Survey coordination, management, analysis and writing

Dr Peter Mwaba	Ministry of Health
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Dr Mulakwa Kamuliwo	Ministry of Health
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Sundie Sianongo	University Teaching Hospital
Timothy Nzangwa	Improving Malaria Diagnostics
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Winnie Mwanalushi	
Grace Zulu	
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Sharon Banda	Natural Resources Development College

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Todd Jennings	PATH MACEPA
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Laura Newman	PATH MACEPA

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Chrispin Chisanga	Lab technician
Nacheelo Chizongo	Lab technician
Conrad Sikanyiti	Enumerator

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Jesse Zulu	Nurse
Vivian Mwinga Hatontola	Nurse
Ireen Mutamina	Nurse
Brian Bulaya	Lab technician/supervisor
Chibamba Wesley	Lab technician
Jacob Chirwa	Lab technician/supervisor
Nelson Kumwenda	Lab technician
Stephen Ngosa Kayoka	Enumerator
Collins Kamocha	Enumerator

Eastern Province

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Doris Nkowani Mwanza	Nurse/team leader
Christine Kabula Chinyama	Nurse/team leader
Evalyn Mwale Phiri	Nurse
Sharon Mumba	Lab technician
Angel Chinaka	Lab technician
Marilyn Banda	Lab technician
Zephania Nchimunya M.	Lab technician
John Phiri	Enumerator
Davidson Shumba	Enumerator

Luapula Province

Beatrice Kangwa Chirwa	Nurse
Mary Nanyangwe	Nurse/team leader
Melody P Chisopo Shawa	Nurse
Joseph Zgambo	Nurse
Mary Nanyangwe	Nurse
Godfridah Njovu	Lab technician
Stanley Chinyanta	Lab technician/team leader
Lebitina Banda	Lab technician
Mary Muyembe Simalimbu	Lab technician
Edward Phiri	Enumerator
Sydney Mweenda Mukumbuta	Enumerator

Lusaka Province

Kaluba Dynes Chinyama	Nurse
Ziwa Lomache	Nurse
Febby Phiri Banda	Nurse
Ireen Mubita	Nurse/team leader
Carol Manda	Lab technician
Tamishe Mwauseya	Lab technician

Proscovia Miiye	Lab technician
Chuki Mvula	Lab technician
Joy Beene	Lab technician/team leader
Sinyemba Simyemba	Enumerator
Gloria Kashinga	Enumerator

Northern Province

Pauline Namposya	Nurse
Valerie Mambwe Mhango C.	Nurse
Joyce Nawakwi	Nurse/team leader
Mable Mwaba	Nurse
Medrine Shamufwele	Lab technician
Musonda Mabengwa	Lab technician
Elemson Eric Ndhlovu	Lab technician
Rodgers Nduluma	Lab technician/team leader
Robert Mwansa	Enumerator
Joseph Silwavwe	Enumerator

North-Western Province

Hilda Chama Sakapita	Nurse
Melody Musoyo	Nurse/team leader
Kambeu Chinyama	Lab technician
Chituki Mwenya	Lab technician
Sakala Shyton	Enumerator

Southern Province

Ireen Bubala Miyanda	Nurse
Sonia Kadakwa	Nurse/team leader
Bertina Mwiinga	Nurse
Chanda Ashah Chiwele	Nurse
Calistus Mupotola	Lab technician
Gilbert Munsaka	Lab technician/team leader
Mwiche Siame	Lab technician
Darius Sintolongo	Lab technician
Clymore Kalyangile	Enumerator
Albert Mukandu	Enumerator

Western Province

Thandiwe Lubasi Lance	Nurse/supervisor
Lilian Maboshe Mulemwa	Nurse
Bridget Muzyamba	Lab technician
Manyepa Mespa	Lab technician
Tabakamulamu Liswaniso	Enumerator

Appendix C: Questionnaires

Zambia Malaria Indicator Survey 2010

Household Questionnaire

ZAMBIA MALARIA INDICATOR SURVEY
MODEL HOUSEHOLD QUESTIONNAIRE

IDENTIFICATION[1]	
PLACE NAME _____	
NAME OF HOUSEHOLD HEAD _____	
CLUSTER NUMBER	–
HOUSEHOLD NUMBER	
REGION	
URBAN/RURAL (URBAN=1, RURAL=2)	
LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE[2] (LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)	

INTERVIEWER VISITS				
	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				NAME
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NO. OF VISITS
TIME				

*RESULT CODES:

1	COMPLETED
2	NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3	ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4	POSTPONED
5	REFUSED
6	DWELLING VACANT OR ADDRESS NOT A DWELLING
7	DWELLING DESTROYED
8	DWELLING NOT FOUND
9	OTHER _____ (SPECIFY)

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

LINE NUMBER OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

[1] This section should be adapted for country-specific survey design.

[2] The following guidelines should be used to categorize urban sample points: "Large cities" are national capitals and places with over 1 million population; "small cities" are places with between 50,000 and 1 million population; the remaining urban sample points are "towns."

HOUSEHOLD LISTING

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	TIME INDOORS / OUTDOORS				ELIGIBLE WOMEN
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	To the nearest hour, what time last night did (NAME) go indoors for the evening? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time last night did (NAME) go to bed? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time this morning did (NAME) get out of bed? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time this morning did (NAME) go outdoors? RECORD HOUR ON 24 HOUR CLOCK	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7.1)	(7.2)	(7.3	(7.4	(8)
01			M F 1 2	YES NO 1 2	YES NO 1 2	IN YEARS	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	01
02			1 2	1 2	1 2						02
03			1 2	1 2	1 2						03
04			1 2	1 2	1 2						04
05			1 2	1 2	1 2						05

* CODES FOR Q.3 RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE/HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/ STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

LINE NO.	FEVER PREVALENCE AND TREATMENT									
	Has (NAME) been ill with a fever at any time in the last 2 weeks? IF NO SKIP TO NEXT PERSON,	How many days ago did the fever start? IF LESS THAN ONE DAY, THEN RECORD '00'.	Did (NAME) seek advice or treatment for the fever from any source?	Where did you seek advice or treatment? Anywhere else? RECORD ALL SOURCES MENTIONED	How many days after the fever began did (NAME) first seek advice or treatment? IF SAME DAY, RECORD '00'.	Is (NAME) still sick with a fever?	At any time during the illness, did (NAME) take any drugs for the fever?	What drugs did (NAME) take?[1] Any other drugs? RECORD ALL MENTIONED.	How long after the fever started did (NAME) first take DRUG NAME?	For how many days did (NAME) take the DRUG NAME? IF 7 OR MORE DAYS, RECORD '7'
(1)	(9.1)	(9.2)	(9.3)	(9.4)	(9.5)	(9.6)	(9.7)	(9.8)	(9.9)	(9.10)
01	YES NO DK 1 2 8	DK = 99	YES NO DK 1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H PHARMACY ……I PRIVATE DOCTOR……J MOBILE CLINIC……K FIELD WORKER……L OTHER PVT. MED. _____M (SPECIY) OTHER SOURCE SHOP……N TRAD. PRACTITIONER……O OTHER _____ X (SPECIFY)	DK = 99 DAYS…. .	YES NO DK 1 2 8	YES NO DK 1 2 8	DK = 8 SP/FANSIDAR……A QUININE……B COARTEM / ACT...C ASPIRIN……D PARACETAMOL....E IBUPROFEN……F OTHER _____....X DON'T KNOW…….Z	DK = 8 SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	DK = 99
02	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H PHARMACY ……I PRIVATE DOCTOR……J MOBILE CLINIC……K FIELD WORKER……L OTHER PVT. MED. _____M (SPECIY) OTHER SOURCE SHOP……N TRAD. PRACTITIONER……O OTHER _____ X (SPECIFY)	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT...C ASPIRIN……D PARACETAMOL....E IBUPROFEN……F OTHER _____....X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	
03	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H PHARMACY ……I	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT...C ASPIRIN……D PARACETAMOL....E IBUPROFEN……F OTHER _____....X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	

				PRIVATE DOCTOR……J MOBILE CLINIC……K FIELD WORKER……L OTHER PVT. MED. _____M (SPECIY) OTHER SOURCE SHOP……N TRAD. PRACTITIONER……O OTHER _____ X (SPECIFY)						
04	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER……B GOVT. HEALTH POST ……C MOBILE CLINIC……D FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H PHARMACY ……I PRIVATE DOCTOR……J MOBILE CLINIC……K FIELD WORKER……L OTHER PVT. MED. _____M (SPECIY) OTHER SOURCE SHOP……N TRAD. PRACTITIONER……O OTHER _____ X (SPECIFY)	DAYS… . .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT...C ASPIRIN……D PARACETAMOL....E IBUPROFEN……F OTHER _____....X DON'T KNOW……Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……4 DON'T KNOW ….8	
05	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER……B GOVT. HEALTH POST ……C MOBILE CLINIC……D FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H PHARMACY ……I PRIVATE DOCTOR……J MOBILE CLINIC……K FIELD WORKER……L OTHER PVT. MED. _____M (SPECIY) OTHER SOURCE SHOP……N TRAD. PRACTITIONER……O OTHER _____ X (SPECIFY)	DAYS… . .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT...C ASPIRIN……D PARACETAMOL....E IBUPROFEN……F OTHER _____....X DON'T KNOW……Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……4 DON'T KNOW ….8	

Continued….

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	TIME INDOORS / OUTDOORS				ELIGIBLE WOMEN
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	To the nearest hour, what time last night did (NAME) go indoors for the evening? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time last night did (NAME) go to bed? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time this morning did (NAME) get out of bed? RECORD HOUR ON 24 HOUR CLOCK	To the nearest hour, what time this morning did (NAME) go outdoors? RECORD HOUR ON 24 HOUR CLOCK	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7.1)	(7.2)	(7.3	(7.4	(8)
06			M F 1 2	YES NO 1 2	YES NO 1 2	IN YEARS	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	01
07			1 2	1 2	1 2						02
08			1 2	1 2	1 2						03
09			1 2	1 2	1 2						04
10			1 2	1 2	1 2						05

* CODES FOR Q.3 RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE/HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/ STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

LINE NO.	FEVER PREVALENCE AND TREATMENT									
	Has (NAME) been ill with a fever at any time in the last 2 weeks? IF NO SKIP TO NEXT PERSON,	How many days ago did the fever start? IF LESS THAN ONE DAY, THEN RECORD '00'.	Did (NAME) seek advice or treatment for the fever from any source?	Where did you seek advice or treatment? Anywhere else? RECORD ALL SOURCES MENTIONED	How many days after the fever began did (NAME) first seek advice or treatment? IF SAME DAY, RECORD '00'.	Is (NAME) still sick with a fever?	At any time during the illness, did (NAME) take any drugs for the fever?	What drugs did (NAME) take?[1] Any other drugs? RECORD ALL MENTIONED.	How long after the fever started did (NAME) first take DRUG NAME?	For how many days did (NAME) take the DRUG NAME? IF 7 OR MORE DAYS, RECORD '7'
(1)	(9.1)	(9.2)	(9.3)	(9.4)	(9.5)	(9.6)	(9.7)	(9.8)	(9.9)	(9.10)
06	YES NO DK 1 2 8	DK = 99	YES NO DK 1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D COMMUNITY HEALTH WOKER / FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H MISSION HOSPITAL/ CLINIC……I PHARMACY ……J PRIVATE DOCTOR……K MOBILE CLINIC……L COMMUNITY HEALTH WOKER / FIELD WORKER……M OTHER PVT. MED. _____N (SPECIY) OTHER SOURCE SHOP……O TRAD. PRACTITIONER……P OTHER _____ X (SPECIFY)	DK = 99 DAYS…. .	YES NO DK 1 2 8	YES NO DK 1 2 8	DK = 8 SP/FANSIDAR……A QUININE……B COARTEM / ACT…C ASPIRIN……D PARACETAMOL….E IBUPROFEN……F OTHER _____….X DON'T KNOW…….Z	DK = 8 SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……4 DON'T KNOW ….8	DK = 99
07	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D COMMUNITY HEALTH WOKER / FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……H MISSION HOSPITAL/ CLINIC……I PHARMACY ……J PRIVATE DOCTOR……K MOBILE CLINIC……L COMMUNITY HEALTH WOKER / FIELD WORKER……M OTHER PVT. MED. _____N (SPECIY) OTHER SOURCE SHOP……O TRAD. PRACTITIONER……P OTHER _____ X (SPECIFY)	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT…C ASPIRIN……D PARACETAMOL….E IBUPROFEN……F OTHER _____….X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……4 DON'T KNOW ….8	

08	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D COMMUNITY HEALTH WOKER / FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……..H MISSION HOSPITAL/ CLINIC…….I PHARMACY ……J PRIVATE DOCTOR……K MOBILE CLINIC……L COMMUNITY HEALTH WOKER / FIELD WORKER……M OTHER PVT. MED. _____N (SPECIY) OTHER SOURCE SHOP……O TRAD. PRACTITIONER……P OTHER _____ X (SPECIFY)	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT…C ASPIRIN……D PARACETAMOL….E IBUPROFEN……..F OTHER _____….X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	
09	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D COMMUNITY HEALTH WOKER / FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……..H MISSION HOSPITAL/ CLINIC…….I PHARMACY ……J PRIVATE DOCTOR……K MOBILE CLINIC……L COMMUNITY HEALTH WOKER / FIELD WORKER……M OTHER PVT. MED. _____N (SPECIY) OTHER SOURCE SHOP……O TRAD. PRACTITIONER……P OTHER _____ X (SPECIFY)	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT…C ASPIRIN……D PARACETAMOL….E IBUPROFEN……..F OTHER _____….X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	
10	1 2 8		1 2 8	PUBLIC SECTOR GOVT. HOSPITAL……A GOVT. HEALTH CENTER…….B GOVT. HEALTH POST ……..C MOBILE CLINIC……D COMMUNITY HEALTH WOKER / FIELD WORKER……F OTHER PUBLIC _____G (SPEC) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC……..H MISSION HOSPITAL/ CLINIC…….I PHARMACY ……J PRIVATE DOCTOR……K MOBILE CLINIC……L COMMUNITY HEALTH WOKER / FIELD WORKER……M OTHER PVT. MED. _____N (SPECIY) OTHER SOURCE SHOP……O TRAD. PRACTITIONER……P OTHER _____ X (SPECIFY)	DAYS…. .	1 2 8	1 2 8	SP/FANSIDAR……A QUININE……B COARTEM / ACT…C ASPIRIN……D PARACETAMOL….E IBUPROFEN……..F OTHER _____….X DON'T KNOW…….Z	SAME DAY……0 NEXT DAY……1 2 DAYS AFTER THE FEVER..2 3 DAYS AFTER THE FEVER..3 4 OR MORE DAYS AFTER THE FEVER……..4 DON'T KNOW ….8	

TICK HERE IF CONTINUATION SHEET USED	☐				
Just to make sure that I have a complete listing:					
1) Are there any other persons such as small children or infants that we have not listed?	YES	☐ ->	ENTER EACH IN TABLE	NO	☐
2) In addition, are there any other people who may not be members of your family, such as domestic staff, lodgers or friends who usually live here?	YES	☐ ->	ENTER EACH IN TABLE	NO	☐
3) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed?	YES	☐ ->	ENTER EACH IN TABLE	NO	☐

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
9.11	For the head of household, did he/she ever **attend** school?	YES ..... 1 NO 2	 →10
9.12	For the head of household, what is the highest level of school **attended**: primary, secondary, or higher?[1]	PRIMARY ..... 1 SECONDARY ..... 2 HIGHER 3	
10	What is the main source of drinking water for members of your household?[1]	PIPED WATER PIPED INTO DWELLING ..... 11 PIPED INTO YARD/PLOT ..... 12 PUBLIC TAP/STANDPIPE ..... 13 TUBE WELL OR BOREHOLE ..... 21 DUG WELL PROTECTED WELL ..... 31 UNPROTECTED WELL ..... 32 WATER FROM SPRING PROTECTED SPRING ..... 41 UNPROTECTED SPRING ..... 42 RAINWATER ..... 51 TANKER TRUCK ..... 61 CART WITH SMALL TANK ..... 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL ..... 81 BOTTLED WATER ..... 91 OTHER _____ 96 (SPECIFY)	
11	What kind of toilet facility do your household use?[1]	FLUSH OR POUR FLUSH TOILET FLUSH TO PIPED SEWER SYSTEM ..... 11 FLUSH TO SEPTIC TANK ..... 12 FLUSH TO PIT LATRINE ..... 13 FLUSH TO SOMEWHERE ELSE ..... 14 FLUSH, DON'T KNOW WHERE ..... 15 PIT LATRINE VENTILATED IMPROVED PIT LATRINE (VIP) ..... 21 PIT LATRINE WITH SLAB ..... 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT ..... 23 COMPOSTING TOILET ..... 31 BUCKET TOILET ..... 41 HANGING TOILET/HANGING LATRINE ..... 51 NO FACILITY/BUSH/FIELD ..... 61 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
12	Does your household have:[2]	YES NO	
	Electricity?	ELECTRICITY 1 2	
	A radio?	RADIO 1 2	
	A television?	TELEVISION 1 2	
	A mobile telephone?	MOBILE TELEPHONE 1 2	
	A non-mobile telephone?	NON-MOBILE TELEPHONE..... 1 2	
	A refrigerator?	REFRIGERATOR..... 1 2	
	A bed?	BED 1 2	
	A chair?	CHAIR..... 1 2	
	A table?	TABLE 1 2	
	A Cupboard?	CUPBOARD 1 2	
	A sofa?	SOFA..... 1 2	
	A clock?	CLOCK 1 2	
	A fan?	FAN 1 2	
	A sewing machine?	SEWING MACHINE..... 1 2	
	A cassette player?	CASSETTE PLAYER 1 2	
	A plough?	PLOUGH..... 1 2	
	A grain grinder?	GRAIN GRINDER 1 2	
	A VCR/DVD?	VCR/DVD 1 2	
	A tractor?	TRACTOR..... 1 2	
	A vehicle?	VEHICLE 1 2	
	A hammer mill?	HAMMER MILL 1 2	
13	What type of fuel does your household mainly use for cooking?	ELECTRICITY ..... 01 LPG/NATURAL GAS..... 02 BIOGAS..... 03 KEROSENE ..... 04 COAL/LIGNITE..... 05 CHARCOAL ..... 06 FIREWOOD/STRAW..... 07 DUNG..... 08 OTHER _____ 96 (SPECIFY)	

[1] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.
[2] Additional indicators of socioeconomic status should be added, especially to distinguish among lower socioeconomic classes.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
14a	MAIN MATERIAL OF THE FLOOR.[1] RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND ..... 11 DUNG ..... 12 RUDIMENTARY FLOOR WOOD PLANKS ..... 21 PALM/BAMBOO ..... 22 FINISHED FLOOR PARQUET OR POLISHED WOOD ..... 31 VINYL OR ASPHALT STRIPS ..... 32 CERAMIC TILES ..... 33 CEMENT ..... 34 CARPET ..... 35 OTHER _____ 96 (SPECIFY)	
14b	MAIN MATERIAL OF THE WALL.[1] RECORD OBSERVATION.	NATURAL WALL No walls ..... 11 Cane/sticks/bamboo/reed ..... 12 RUDIMENTARY WALL Bamboo/wood with mud ..... 21 Stone with mud ..... 22 Uncovered abode ..... 23 Plywood ..... 24 Carton ..... 25 FINISHED WALL Cement ..... 31 Stone with lime/cement ..... 32 Bricks ..... 33 Cement blocks ..... 34 Covered Adobe ..... 35 Wood planks/shingles ..... 36 OTHER _____ 96 (SPECIFY)	
14c	MAIN MATERIAL OF THE ROOF.[1] RECORD OBSERVATION.	NATURAL ROOF Thatch/Leaf ..... 11 Sticks and mud ..... 12 RUDIMENTARY ROOF Rustic mat/plastic sheet ..... 21 Reed/bamboo ..... 22 Wood planks ..... 23 FINISHED WALL Corrugated iron ..... 31 Wood ..... 32 Calamine/cement fiber ..... 33 Cement/concrete ..... 34 Roofing shingles ..... 35 OTHER _____ 96 (SPECIFY)	
14c1	ARE THE EAVES OF THE HOUSE OR BUILDING OCCUPIED BY THIS HOUSEHOLD OPEN OR CLOSED? RECORD OBSERVATION.	OPEN..... 1 CLOSED .....2 PARTIALLY OPEN.....3	
14c2	DOES THE PART OF THE HOUSE OR BUILDING OCCUPIED BY THE HOUSEHOLD HAVE A CEILING? RECORD OBSERVATION.	NONE..... 1 PARTIAL/POORLY SEALED/WORN OUT.....2 COMPLETE AND SEALED.....3	

14c3	IF A CEILING IS PRESENT, WHAT TYPE OF MATERIAL IS THE CEILING PRIMARILY CONSTRUCTED OF? RECORD OBSERVATION.	WOOD / PLYWOOD BOARDS……. 1 GYPSUM / PLASTERCASTE…….2 MUD AND WADDLE……..……..3 WOVEN PALM THATCH……..……4 OTHER……..……..5	
14d	TYPE OF WINDOWS RECORD OBSERVATION.	YES NO ANY WINDOW……1 2 WINDOWS WITH GLASS..... 1 2 WINDOWS WITH SCREENS...1 2 WINDOWS WITH CURTAINS OR SHUTTERS……....1 2	
14d1	Are the windows and any airbrick gaps in the house or building boarded up, glazed or screened against mosquito entry with netting ? ASK OR RECORD OBSERVATION.	COMPLETE……. 1 COMPLETE WITH HOLES……..…2 INCOMPLETE OR BADLY DAMAGED…3 ABSENT……4	—<14e
14d2	If windows are boarded up, glazed or screened, what primary material is used to do so ? ASK OR RECORD OBSERVATION.	WOOD BOARDS……. 1 GLASS……..2 METAL NETTING…..……..……..3 FABRIC NETTING……..……..……4 PLASTIC NETTING……..……..……5 OTHER……..……..6	—<14e
14e	How many separate rooms are in this household? INCLUDE ALL ROOMS, INCLUDING KITCHEN, TOILET, SLEEPING ROOMS, SALON, etc.	NUMBER OF ROOMS L	

14f	How many rooms in this household are used for sleeping? INCLUDE ONLY ROOMS WHICH ARE USUALLY USED FOR SLEEPING.	NUMBER OF SLEEPING ROOMS ☐☐	
14g	How many separate sleeping spaces are there in your household? INCLUDE ALL SLEEPING SPACES, INCLUDING IF THERE IS MORE THAN ONE SLEEPING SPACE IN EACH ROOM USED FOR SLEEPING.	NUMBER OF SLEEPING SPACES ☐☐	
14h	Does any member of the household own any agricultural land?	YES.....1 NO.....2	—<14j
14i	How much agricultural land do members of this household own?	Lima…….. ☐☐ Acres…….. ☐☐ Hectares……. ☐☐ 95 or more hectares……995 Don't know……998	
14j	Does this household own any livestock, herds other farm animals, or poultry?	YES.....1 NO.....2	
14k	How many of the following animals does this household own? IF NONE, ENTER '0' IF MORE THAN 95, ENTER '95' IF UNKNOWN, ENTER '98': Traditional cattle? Dairy cattle? Beef cattle? Horses, donkeys, mules? Goats? Sheep? Pigs? Chickens? Other poultry? Other livestock?	TRADITIONAL ☐☐ DAIRY ☐☐ BEEF ☐☐ HORSES/DONKEYS/MULES ☐☐ GOATS ☐☐ SHEEP ☐☐ PIGS ☐☐ CHICKEN ☐☐ OTHER POULTRY ☐☐ OTHER LIVESTOCK ☐☐	

15	Does any member of your household own: A watch? A bicycle? A motorcycle or motor scooter? An animal drawn cart? A car or truck? A boat with a motor? A banana boat?	YES NO WATCH .....1 2 BICYCLE .....1 2 MOTORCYCLE/SCOOTER .....1 2 ANIMAL-DRAWN CART .....1 2 CAR/TRUCK .....1 2 BOAT WITH MOTOR .....1 2 BANANA BOAT.....1 2	
15A	At any time in the past 12 months, has anyone sprayed the interior walls of your dwelling against mosquitoes?[2]	YES.....1 NO.....2 DON'T KNOW.....8	<15D
15B	How many months ago was the house sprayed?[2] IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO..... ☐☐	
15C	Who sprayed the house?[2]	GOVERNMENT WORKER/PROGRAM ... 1 PRIVATE COMPANY ..... 2 HOUSEHOLD MEMBER ..... 3 OTHER _____ 6 (SPECIFY) DON'T KNOW..... 8	
15D	At any time in the past 12 months, have the walls in your dwelling been plastered or painted?	YES.....1 NO.....2 DON'T KNOW.....8	16
15E	How many months ago were the walls plastered or painted? IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO ☐☐	
15F	Have any of the following been used in your living space over the last week: Mosquito coils? Insecticide spray (eg. DOOM, Rungu, Expel)? Repellents?	YES NO Mosquito coils..... 1 2 Insecticide spray..... 1 2 Repellents..... 1 2	
16	Does your household have any mosquito nets that can be used while sleeping?	YES..... 1 NO 2	→ 27
17	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS..... ☐	
17a	Has anyone in your household ever sold or given away a mosquito net?	YES, SOLD A MOSQUITO NET..... 1 YES, GAVE AWAY A MOSQUITO NET... 2 NO ..... 3 DON'T KNOW..... 4 REFUSED..... 5	

[1] Categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. In some countries, it may be desirable to ask an additional question on the material of walls or ceilings.

[2] This question should be deleted in countries that do not have an indoor residual spraying program for mosquitoes.

		NET #1	NET #2	NET #3
18	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED .... 1 NOT OBSERVED 2	OBSERVED..............1 NOT OBSERVED..............2	OBSERVED ....1 NOT OBSERVED 2
19	How long ago did your household obtain the mosquito net?	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO 95	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO........................95	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO 95
20	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	'PERMANENT' NET[1] Permanet…………11 Olyset……………12 MamaSafeNite…..13 NetProtect……….14 Other/Don't Know……16 (SKIP TO 24) 'PRETREATED' NET[2] ICONET………..21 Fennet………….22 KO Nets………..23 Safinet………...24 Other/Don't Know….. 26 (SKIP TO 22) OTHER……………….31 DON'T KNOW BRAND……………..98	'PERMANENT' NET[1] Permanet………11 Olyset…………12 MamaSafeNite…13 NetProtect…….14 Other/Don't Know……16 (SKIP TO 24) 'PRETREATED' NET[2] ICONET………..21 Fennet………….22 KO Nets………..23 Safinet………...24 Other/Don't Know. 26 (SKIP TO 22) OTHER……………….31 DON'T KNOW BRAND……………..98	'PERMANENT' NET[1] Permanet………11 Olyset…………12 MamaSafeNite..13 NetProtect……….14 Other/Don't Know……16 (SKIP TO 24) 'PRETREATED' NET[2] ICONET………..21 Fennet………….22 KO Nets………..23 Safinet………...24 Other/Don't Know….. 26 (SKIP TO 22) OTHER……………….31 DON'T KNOW BRAND……………..98
20a	Where did you obtain the net?	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)_______ DON'T KNOW	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW
20b	Did you purchase the net?	YES…...........................1 NO.(skip to 21)….............2 NOT SURE….................8	YES….......................1 NO.(skip to 21)…........2 NOT SURE…..............8	YES…...........................1 NO.(skip to 21)….............2 NOT SURE…................8
20c	How much did you pay for the net when it was purchased?	In Kwacha [ ][ ]	In Kwacha [ ][ ]	In Kwacha [ ][ ]
21	When you got the net, was it already factory-treated with an insecticide to kill or repel mosquitoes?	YES.............................1 NO...............................2 NOT SURE...................8	YES..........................1 NO ....2 NOT SURE 8	YES.............................1 NO...............................2 NOT SURE...................8
22	Since you got the mosquito net, was it ever soaked or dipped in a liquid to kill or repel mosquitoes or bugs?	YES.............................1 NO...............................2 (SKIP TO 24) NOT SURE...................8	YES..........................1 NO ....2 (SKIP TO 24) NOT SURE 8	YES.............................1 NO...............................2 (SKIP TO 24) NOT SURE...................8

23	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH AGO, RECORD >00' MONTHS. IF LESS THAN 2 YEARS AGO, RECORD MONTHS AGO. IF '12 MONTHS AGO' OR '1 YEAR AGO,' PROBE FOR EXACT NUMBER OF MONTHS.	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO ....95 NOT SURE.............. 98	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO........................ 95 NOT SURE 98	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO........... 95 NOT SURE 98
23a	Where was the net soaked or dipped?	HOME…………………1 GOVERNMENT CLINIC/HOSPITAL…..2 RETAIL SHOP………..3 PHARMACY………….4 WORKPLACE………..5 OTHER (SPECIFY)________.....6 DON'T KNOW………..7	HOME GOVERNMENT CLINIC/HOSPITAL RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)_______ DON'T KNOW	HOME GOVERNMENT CLINIC/HOSPITAL RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW
23b	Did you pay to soak or dip the net?	YES..............................1 NO.(skip to 24).............2 NOT SURE...................8	YES...........................1 NO.(skip to 24)...........2 NOT SURE................8	YES..............................1 NO.(skip to 24).............2 NOT SURE...................8
23c	How much did you pay to soak or dip the net?	In Kwacha [ ][ ]	In Kwacha [ ][ ]	In Kwacha [ ][ ]
23d	PLEASE RECORD OR ASK THE GENERAL CONDITION OF THE NET.	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown
23e	PLEASE RECORD OR ASK THE COLOR OF THE NET.	1. Green 2. Blue 3. Red 4. White 5. Black Other ________	1. Green 2. Blue 3. Red 4. White 5. Black Other ________	1. Green 2. Blue 3. Red 4. White 5. Black Other ________
23f	PLEASE RECORD OR ASK THE SHAPE OF THE NET.	1. Conical 2. Rectangular 3. Other ________	1. Conical 2. Rectangular 3. Other ________	1. Conical 2. Rectangular 3. Other ________
23g	Is the net hanging for sleeping? PLEASE OBSERVE OR ASK IF THE NET IS HANGING	YES..............................1 NO...............................2	YES.............................1 NO...............................2	YES..............................1 NO...............................2
24	Did anyone sleep under this mosquito net last night?	YES..............................1 NO................................2 (SKIP TO 26) NOT SURE...................8	YES...........................1 NO ....2 (SKIP TO 26) NOT SURE 8	YES..............................1 NO................................2 (SKIP TO 26) NOT SURE...................8

"Permanent" is a factory treated net that does not require any further treatment.
[2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6-12 months.

		NET #1	NET #2	NET #3
25	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO	NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO	NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO NAME _____ LINE NO
26		GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 27.

HAEMOGLOBIN/MALARIA PARASITE MEASUREMENT

CHECK COLUMN (7) OF HOUSEHOLD LISTING: RECORD THE LINE NUMBER, NAME AND AGE OF ALL CHILDREN UNDER AGE 6. THEN ASK THE DATE OF BIRTH.

CHILDREN UNDER AGE 6 YEARS/HOUSEHOLD MEMBER					CONSENT STATEMENT FOR CHILDREN UNDER SIX (BORN IN 2002 OR AFTER) (AND HOUSEHOLD MEMBERS)	
LINE NUMBER FROM COL. (1)	NAME FROM COL. (2)	Is (NAME) present for a malaria/anemia test?	AGE FROM COL. (7)	What is (NAME's) date of birth? COPY MONTH AND YEAR OF BIRTH FROM 215 IN MOTHER'S BIRTH HISTORY AND ASK DAY. FOR CHILDREN NOT INCLUDED IN ANY BIRTH HISTORY, ASK DAY, MONTH AND YEAR.	LINE NUMBER OF PARENT/ADULT RESPONSIBLE FOR THE CHILD RECORD '00' IF NOT LISTED IN HOUSEHOLD SCHEDULE	READ CONSENT STATEMENT TO PARENT/ADULT RESPONSIBLE FOR THE CHILD
(27)	(28)	(28.5)	(29)	(30)	(31)	(32)
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.		DAY MONTH YEAR		GRANTED YES……..1 NO……2
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.				YES……..1 NO……2
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.				YES……..1 NO……2
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.				YES……..1 NO……2
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.				YES……..1 NO……2
		YES……..1 NO……2 IF NO, SKIP TO NEXT PERSON.				YES……..1 NO……2

[1] For fieldwork beginning in 2006, 2007 or 2008, the year should be 2001, 2002 or 2003, respectively.	TICK HERE IF CONTINUATION SHEET USED ☐	CONSENT STATEMENT: Introduction The National Malaria Control Centre, Ministry of Health, PATH Malaria Control and Evaluation Partnership in Africa (MACEPA), Catholic Medical Missions Board, the World Health Organization and malaria control partners want to learn how well malaria prevention program is working in Zambia. We would like to ask you some questions about bednet use in your home, and also some general questions about your child[ren]'s health. We are also doing a survey of malaria in children. To do this, we will test children for malaria parasites in the blood. One way to test for malaria parasites in the blood includes taking a small sample of blood by fingerprick and examining under a microscope and in a laboratory. Another way is to look at anaemia (low levels of blood), by taking a small sample of blood by fingerprick and examining with a hemocue machine. The World Health Organization (WHO) has set up a guide for us to look at both. We are using this guide to help with the malaria program in Zambia. Purpose of the survey We want to use the WHO guide to see if your country's malaria program works. We also want to test if a communication campaign increases bednet use among children in this community. We will ask you some questions about bednet use in your home, and also about your child[ren]'s health. We will also see how common malaria is among young children in the community by testing for parasites in the blood and also by testing for low levels of blood. We will visit people in their homes and look at people that come to health facilities. This will help us learn how best to measure the effects of malaria control in the community. Procedures If you agree to take part, we will ask you a few questions and a nurse will take a small amount of blood from your child's finger. We will ask you questions about bednet use in your home, and about other things that are linked to malaria. We will also ask some questions about your health and about your child[ren]'s health. This should only take about 30 minutes. We will take only up to 5 drops of blood from your child. One drop of blood will be wiped off. The second drop of blood will be used to test for malaria in the lab using a microscope. The third drop of blood will be used to test for low levels of blood (anemia) here in the house. The fourth drop will be used for a rapid malaria diagnostic test here in the house. The remaining drop of blood may be put on paper for additional laboratory analysis of malaria. The results for low levels of blood and for the rapid malaria diagnostic test will be given to you today. If your child has low levels of blood, malaria or history of fever, we will give you treatment. This will be the same treatment your child would get if you went to your health center. This will cost you and your family nothing. If the nurse thinks that your child is very ill, we will give you transportation to the nearest health clinic and assure that the child is provided with the necessary health care. Lab test results will be ready after one week. If your child has malaria, a survey staff member will return to your house to give treatment for malaria to your child. This will only happen if your child has not already been treated today. Even if you do not wish to take part, you can still ask to see the nurse and get the correct treatment. Even if you do not agree to take part, if your child is ill, you should visit the nearest health clinic if your child is not better in 3 days or is worse over time. Risks and Benefits Your child will feel a pinch that lasts a few seconds when we take the blood tests. For any malaria health problem that we find, the nurse will give the treatments that the Ministry of Health suggests. These drugs are proven safe and effective but any drugs can cause side effects in a small number of patients. The nurse will discuss these with you. Voluntariness It is your choice to be in this survey. It will not affect the care that the nurse will give you or your child[ren] should you wish to receive it. If you do agree to take part, your answers to all questions and your child's test results will be kept private to the extent the law allows. If you agree to take part, you can also decide not to answer any of the questions that you do not want to, and you can refuse the blood tests. If you have any questions or clarification pertaining to this survey please feel free to ask the field nurse or the medical officer in charge in the field whose name and contact information is given below. You may also contact Dr. Mulakwa Kamuliwo, Acting Coordinator, National Malaria Control Centre, Ministry of Health, Lusaka. Tel: +26 0211 282455. (field nurse name here). Thank you very much for your time. Would you like to take part in this survey?	NOTE: In countries where some enumeration areas are higher than 1,000 meters, altitude information should be collected in a separate form for each enumeration area higher than 1,000 meters so that the anaemia estimates can be adjusted appropriately.

LINE NUMBER FROM COL. (1)	HAEMOGLOBIN LEVEL (G/DL)	RESULT 1 MEASURED 2 NOT PRESENT 3 REFUSED 4 OTHER	ANEAMIA TREATMENT	RDT RESULT	TREATMENT	BLOODSLIDE 1 DONE 2 NOT PRESENT 3 REFUSED 4 OTHER	BLOODSLIDE NUMBER
(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B
	.		CoArtem…………..1 Iron………………..2 Albendazole……..3	Pf positive………....1 NEGATIVE…………2 NOT VALID…………3 NOT DONE…………4	CoArtem……………..1 SP……………………2 Quinine………………..3 No treatment………...4		A B

41	CHECK 34: NUMBER OF CHILDREN WITH HAEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 36.[1] NONE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT AND END THE HOUSEHOLD INTERVIEW.
42	We detected a low level of haemoglobin in the blood of [NAME OF CHILD(REN)]. This indicates that (NAME OF CHILD(REN) has/have developed severe anaemia, which is a serious health problem. We would like to inform the doctor at _____ about the condition of [NAME OF CHILD(REN)]. This will assist you in obtaining appropriate treatment for the condition. Do you agree that the information about the level of haemoglobin in the blood of [NAME OF CHILD(REN)] may be given to the doctor?

NAME OF CHILD WITH HAEMOGLOBIN BELOW 7 G/DL	NAME OF PARENT/RESPONSIBLE ADULT	AGREES TO REFERRAL?
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2
		YES.....1 NO.....2

[1] If more than one child is below 7 g/dl, read statement in Q.42 to each parent/adult responsible for a child who is below the cutoff point..

Zambia Malaria Indicator Survey 2010

Women's Questionnaire

MODEL WOMEN'S QUESTIONNAIRE

IDENTIFICATION[1]	
PLACE NAME _____	
NAME OF HOUSEHOLD HEAD _____	
CLUSTER NUMBER	
HOUSEHOLD NUMBER	
REGION	
URBAN/RURAL (URBAN=1, RURAL=2)	
LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE[2] ..... (LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)	
NAME AND LINE NUMBER OF WOMAN _____	

INTERVIEWER VISITS				
	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY MONTH YEAR
INTERVIEWER'S NAME	_____	_____	_____	NAME
RESULT*	_____	_____	_____	RESULT
NEXT VISIT: DATE	_____	_____		TOTAL NO. OF VISITS
TIME	_____	_____		

*RESULT CODES:
1 COMPLETED
2 NOT AT HOME
3 POSTPONED
4 REFUSED
5 PARTLY COMPLETED
6 INCAPACITATED
7 OTHER _____ (SPECIFY)

COUNTRY-SPECIFIC INFORMATION: LANGUAGE OF QUESTIONNAIRE, LANGUAGE OF INTERVIEW, NATIVE LANGUAGE OF RESPONDENT, AND WHETHER TRANSLATOR USED

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

[1] This section should be adapted for country-specific survey design.

[2] The following guidelines should be used to categorize urban sample points: "Large cities" are national capitals and places with over 1 million population; "small cities" are places with between 50,000 and 1 million population; and the remaining urban sample points are "towns".

Section 1: RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working with Ministry of Health. The National Malaria Control Centre, Ministry of Health, PATH Malaria Control and Evaluation Partnership in Africa (MACEPA), Catholic Medical Missions Board the World Health Organization and malaria control partners want to learn how well malaria prevention program is working in Zambia. We would like to ask you some questions about you and your children, the history of children to whom you may have given birth, bednet use in your home, and also some general questions about your child[ren]'s health. We would appreciate your participation in this survey. The information you provide will help the government to plan health services. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept confidential and will not be shown to other persons who are not investigators as part of this survey.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions.

At this time, do you want to ask me anything about the survey? If you have any questions or clarification pertaining to this survey please feel free to ask the field nurse or the medical officer in charge in the field whose name and contact information is given below. (field nurse name and telephone here) _____. or Study Coordinator: Dr. Mulakwa Kamuliwo, Acting Coordinator, National Malaria Control Centre, Chainama Hospital College Grounds, Lusaka, Zambia, Tel: 282455; Fax: 282427.

May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED..... 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED .... 2 —<END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR ..... ▒▒ MINUTES ..... ▒▒	
102	In what month and year were you born?	MONTH ..... ▒▒ DON'T KNOW MONTH ..... 98 YEAR ..... ▒▒▒▒ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS ▒▒	
104	Have you ever attended school?	YES ..... 1 NO 2	—<108
105	What is the highest level of school you attended: primary, secondary, or higher?[1]	PRIMARY ..... 1 SECONDARY ..... 2 HIGHER 3	
106	What is the highest (grade/form/year) you completed at that level?[1]	GRADE ..... ▒▒	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
107	CHECK 105: PRIMARY ☐ ↓ SECONDARY OR HIGHER ☐		→<109

[1] Revise according to the local education system.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT.[1] IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL ..... 1 ABLE TO READ ONLY PARTS OF SENTENCE ..... 2 ABLE TO READ WHOLE SENTENCE ..... 3 NO CARD WITH REQUIRED LANGUAGE_____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED……..5	
109	What is your religion?	CATHOLIC PROTESTANT MUSLIM TRADITIONAL OTHER _____(specify)	
110	What tribe do you belong to?	BEMBA……1 TONGA……2 NORTH-WESTERN……..3 BAROSTE……..4 NYANJA……..5 MAMBWE……..6 TUMBUKU……..7 OTHER _____(specify)	

[1]Each card should have four simple sentences appropriate to the country (e.g., “Parents love their children”, “Farming is hard work”, “The child is reading a book”, “Children work hard at school”). Cards should be prepared for every language in which respondents are likely to be literate.

Section 2: REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES .....1 NO 2	—<206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES .....1 NO 2	—<204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME..... ▒▒ DAUGHTERS AT HOME..... ▒▒	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES .....1 NO 2	—<206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE..... ▒▒ DAUGHTERS ELSEWHERE... ▒▒	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES .....1 NO 2	—<208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD ..... ▒▒ GIRLS DEAD ..... ▒▒	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL.	NONE.....00 TOTAL..... ▒▒	—<345
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ↓ NO → PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE BIRTH: Was this child born in the last six years? IF NO, CIRCLE '00.' TWO OR MORE BIRTHS: How many of these children were born in the last six years?	NONE.....00 TOTAL IN LAST SIX YEARS..... ▒▒	—<345

211	Now I would like to record the names of all your births in the last six years, whether still alive or not, starting with the most recent one you had. RECORD NAMES OF ALL BIRTHS IN THE LAST 6 YEARS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

212	213	214	215	216	217 IF ALIVE:	218 IF ALIVE	219a IF ALIVE:	219b IF DEAD:	220
What name was given to your (most recent/previous) birth? (NAME)	Were any of these births twins?	Is (NAME) a boy or a girl?	In what month and year was (NAME) born? PROBE: What is his/her birthday?	Is (NAME) still alive?	How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS.	Is (NAME) living with you?	RECORD HOUSEHOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD).	How old was (NAME) when he/she died? IF '1 YR' PROBE: How many months old was (NAME)?	Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
01	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (NEXT BIRTH)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐ ↓ (NEXT BIRTH)	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	
02	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2
03	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2
04	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2
05	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2
06	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2
07	SING... 1 MULT.. 2	BOY .. 1 GIRL . 2	MONTH ☐☐ YEAR ☐☐☐☐	YES.....1 NO.....2 ↓ (GO TO 220)	AGE IN YEARS ☐☐	YES.....1 NO.....2	LINE NUMBER ☐☐	DAYS...1 ☐☐ MONTHS...2 ☐☐ YEARS....3 ☐☐	YES .....1 NO 2

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
221	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTH(S) IN BIRTH TABLE.	YES.....1 NO.....2	
222	COMPARE 210 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK: NUMBERS ARE SAME ☐ NUMBERS ARE DIFFERENT ☐ < (PROBE AND RECONCILE) CHECK: FOR EACH BIRTH: YEAR OF BIRTH IS RECORDED. FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED. FOR EACH DEAD CHILD: AGE AT DEATH IS RECORDED. FOR AGE AT DEATH 12 MONTHS OR ONE YEAR: PROBE TO DETERMINE EXACT NUMBER OF MONTHS		☐ ☐ ☐ ☐
223	CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2003[1] OR LATER. IF NONE, RECORD '0'.		☐
224	Are you pregnant now?	YES.....1 NO.....2 UNSURE.....8	<226
225	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS..... ☐☐	
226	CHECK 223: ONE OR MORE BIRTHS IN 2003[1] OR LATER ☐ NO BIRTHS IN 2003 OR LATER ☐		<345

[1]For fieldwork beginning in 2006, 2007, 2008, 2009 or 2010, the year should be 2001, 2002, 2003, 2004 or 2005, respectively.

SECTION 3: GENERAL MALARIA KNOWLEDGE / PRACTICES

250	HAVE YOU EVER HEARD OF AN ILLNESS CALLED MALARIA?	YES.....1 NO.....2	IF 2, SKIP TO 264
251	CAN YOU TELL ME THE MAIN SIGNS OR SYMPTOMS OF MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	FEVER……..1 FEELING COLD……..2 HEADACHE……3 NAUSEA AND VOMITING……4 DIARRHEA……5 DIZZINESS……..6 LOSS OF APPETITE……7 BODY ACHE OR JOINT PAIN……..8 PALE EYES……9 SALTY TASTING PALMS……..10 BODY WEAKNESS……11 REFUSING TO EAT OR DRINK……12 OTHER (SPECIFY)_____ _____..13 DON'T KNOW……14	
252	IN YOUR OPINION, WHAT CAUSES MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	MOSQUITO BITES……1 EATING IMMATURE SUGARCANE……..2 EATING COLD NSHIMA……..3 EATING OTHER DIRTY FOOD……..4 DRINKING DIRTY WATER……..5 GETTING SOAKED WITH RAIN……6 COLD OR CHANGING WEATHER……7 WITCHCRAFT……8 OTHER (SPECIFY)_____ _____....9 DON'T KNOW.....10	
253	HOW CAN SOMEONE PROTECT THEMSELVES AGAINST MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	SLEEP UNDER A MOSQUITO NET……..1 SLEEP UNDER A INSECTICIDE TREATED MOSQUITO NET……..2 USE MOSQUITO REPELLANT……..3 AVOID MOSQUITO BITES……..4 TAKE PREVENTIVE MEDICATION……..5 SPRAY HOUSE WITH INSECTICIDE……6 USE MOSQUITO COILS……..7 CUT THE GRASS AROUND THE HOUSE……8 FILL IN PUDDLES (STAGNANT WATER)……..9 KEEP HOUSE SURROUNDINGS CLEAN……..10 BURN LEAVES……11 DON'T DRINK DIRTY WATER……..12 DON'T EAT BAD FOOD (IMMATURE SUGARCANE/LEFTOVER FOOD)……..13 PUT MOSQUITO SCREENS ON THE WINDOWS……14 DON'T GET SOAKED WITH RAIN……..15 OTHER (SPECIFY)_____ _____.....16 DON'T KNOW……..17	
254	WHAT ARE THE DANGER SIGNS AND SYMPTOMS OF MALARIA? MULTIPLE RESPONSES POSSIBLE	SEIZURE / CONVULSIONS……..1 GOES UNCONSCIOUS……2 ANY FEVER……3 VERY HIGH FEVER……4 STIFF NECK……5 WEAKNESS……..6 NOT ACTIVE……7 CHILLS/SHIVERING……8	

	PROBE ONCE (ANYTHING ELSE?)	NOT ABLE TO EAT……9 VOMITING……..10 FAINTING……11 CRYING ALL THE TIME……12 RESTLESS, WON'T STAY STILL……..13 DIARRHEA……14 OTHER (SPECIFY:_____) ……..15 DON'T KNOW……16	
255	IN YOUR OPINION, WHICH PEOPLE ARE MOST AFFECTED BY MALARIA IN YOUR COMMUNITY? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	CHILDREN……1 ADULTS……2 PREGNANT WOMEN……3 OLDER ADULTS……4 EVERYONE……5 OTHER (SPECIFY)_____ _____....6 DON'T KNOW.....7	
256	HAVE YOU EVER HEARD OR SEEN ANY MESSAGES / INFORMATION ABOUT MALARIA?	YES.....1 NO.....2	IF 2, SKIP TO 260
257	WHERE DID YOU SEE OR HEAR THESE MESSAGES/INFORMATION? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	GOVERNMENT CLINIC/HOSPITAL…….1 COMMUNITY HEALTH WORKER……2 FRIENDS/FAMILY……3 WORKPLACE……..4 DRAMA GROUPS……5 PEER EDUCATORS……..6 POSTERS/BILLBOARDS……7 ON TV……8 ON THE RADIO……..9 IN THE NEWSPAPER……10 OTHER (SPECIFY) _____ _____.....11 DON'T KNOW……12	
258	HOW LONG AGO DID YOU SEE OR HEAR THESE MESSAGES?	MONTHS..... | |	
259	WHAT TYPE OF MALARIA MESSAGES/INFORMATION DID YOU SEE OR HEAR? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	MALARIA IS DANGEROUS……1 MALARIA CAN KILL……2 MOSQUITOES SPREAD MALARIA……3 SLEEPING UNDER MOSQUITO NET IMPORTANT……4 WHO SHOULD SLEEP UNDER MOSQUITO NET……5 SEEK TREATMENT FOR FEVER……6 SEEK TREATMENT FOR FEVER WITHIN 24 HOURS/PROMPTLY……7 IMPORTANCE OF HOUSE SPRAYING…8 NOT PLASTERING WALLS AFTER SPRAYING……9 ENVIRONMENTAL SANITATION ACTIVITIES……10 OTHER(SPECIFY)……11 DON'T KNOW……12	
260	HAS ANYONE EVER PROVIDED YOU WITH EDUCATION / INFORMATION ON MALARIA **AT YOUR HOME**?	YES……..1 NO……2	IF 2, SKIP TO 264
261	FROM WHOM DID YOU RECEIVE THIS EDUCATION / INFORMATION **AT YOUR HOME**? PROBE, BUT DO NOT PROVIDE ANSWERS	HEALTH CARE WORKER……..1 COMMUNITY HEALTH WORKER……2 FRIENDS/FAMILY……..3 EMPLOYER……4 PEER EDUCATORS……..5 OTHER (SPECIFY)_____.....6 DON'T KNOW……7	

262	HOW LONG AGO DID SOMEONE VISIT YOUR HOME TO PROVIDE EDUCATION / INFORMATION **AT YOUR HOME**?	MONTHS.....| |_|_|	
263	WHAT TYPE OF INFORMATION/EDUCATION ABOUT MALARIA DID YOU RECEIVE **AT YOUR HOME**? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	MALARIA IS DANGEROUS……1 MALARIA CAN KILL……2 MOSQUITOES SPREAD MALARIA……3 SLEEPING UNDER MOSQUITO NET IMPORTANT……4 WHO SHOULD SLEEP UNDER MOSQUITO NET……5 SEEK TREATMENT FOR FEVER…….6 SEEK TREATMENT FOR FEVER WITHIN 24 HOURS/PROMPTLY……7 IMPORTANCE OF HOUSE SPRAYING…8 NOT PLASTERING WALLS AFTER SPRAYING……..9 ENVIRONMENTAL SANITATION ACTIVITIES……10 OTHER(SPECIFY)……11 DON'T KNOW……12	
264	HAS THE COMMUNITY HEALTH WORKER IN YOUR VILLAGE EVER HELPED HANG A MOSQUITO NET IN THIS HOUSE?	YES.....1 NO.....2 DON'T KNOW……3	
265	HAVE ANY MOSQUITO NETS IN THIS HOUSE BEEN USED FOR ANY REASON OTHER THAN SLEEPING?	YES.....1 NO.....2	IF 2 SKIP TO 267
266	WHAT WAS IT USED FOR? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	FISHING……1 COVERING / PROTECTION……2 SCREENS FOR WINDOWS……..3 CLOTHING, WEDDING VEILS……..4 OTHER_____..5 DON"T KNOW……..6	
267	WHAT MOSQUITO NET COLOR DO YOU PREFER? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	BLUE……1 GREEN……2 RED……..3 WHITE……4 BLACK……5 OTHER _____...6	
268	WHAT MOSQUITO NET SHAPE DO YOU PREFER? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	CONICAL……..1 RECTANGULAR……..2 OTHER _____.....3	
269	IN GENERAL, HOW OFTEN DO YOUR CHILDREN SLEEP UNDER A MOSQUITO NET?	ALWAYS ……1 SOMETIMES…..……2 NEVER……3	
270	WHY DO THE CHILDREN WHO SLEEP IN THIS HOUSE SOMETIMES NOT SLEEP UNDER A MOSQUITO NET? MULTIPLE RESPONSES PROBE ONCE (ANYTHING ELSE?)	THEY ALWAYS DO SLEEP UNDER NET……1 TOO HOT……..2 TOO COLD……3 CHILD CRIES……4 CHILD AFRAID……5 NOT ENOUGH NETS……6 NET NOT HUNG UP……..7 USED BY ADULTS……8 NET NOT USED WHEN TRAVELING…..9 NET WORN OUT / POOR CONDITION..10 NETS BAD FOR CHILDERS' HEALTH…11 OTHER (SPECIFY)_____ _____...12 DON'T KNOW……..13	

Section 3A. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

301	ENTER IN 302 THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask you some questions about your last pregnancy that ended in a live birth, in the last 6 years.		
302	FROM QUESTIONS 212 AND 216 (LINE 01)	LAST BIRTH NAME _____ LIVING ☐ DEAD ☐	
303	When you were pregnant with (NAME), did you see anyone for antenatal care?[1] IF YES: Whom did you see? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE..... B AUXILIARY MIDWIFE..... C OTHER PERSON TRADITIONAL BIRTH ATTENDANT……D COMMUNITY/VILLAGE HEALTH WORKER……E OTHER _____ X (SPECIFY) NO ONE ..... Y	
304	During this pregnancy, did you take any drugs in order to prevent you from getting malaria?	YES ..... 1 NO ..... 2 DON'T KNOW 8	☐ →310
305	Which drugs did you take to prevent malaria?[2] RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR.....A CHLOROQUINE ..... B OTHER_____ X (SPECIFY) DON'T KNOW .....Z	
306	CHECK 305: DRUGS TAKEN FOR MALARIA PREVENTION	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐	→310
307	How many times did you take SP/Fansidar during this pregnancy?	TIMES ..... ☐☐	

[1]Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.

[2] Add response categories for additional drugs used to prevent malaria during pregnancy, if any. Repeat Questions 306-309 for any other recommended IPT drugs.

		LAST BIRTH NAME _____	
308	CHECK 303: ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE 'A', 'B', OR 'C' CIRCLED ☐ OTHER ☐ _____	→310
309	Did you get the SP/Fansidar during an antenatal visit, during another visit to a health facility, or from some other source?	ANTENATAL VISIT ..... 1 ANOTHER FACILITY VISIT ..... 2 OTHER SOURCE _____ 6 (SPECIFY)	
	Did you purchase the SP/Fansidar?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→310
	How much did you pay for the SP/Fansidar?	In Kwacha ☐☐☐☐	
310	CHECK 215 AND 216: ONE OR MORE LIVING CHILDREN BORN IN 2003[1] OR LATER ☐ NO LIVING CHILDREN BORN IN 2003[1] OR LATER ☐ _____		→345

[1] For fieldwork beginning in 2006, 2007, or 2008, the year should be 2001, 2002, or 2003, respectively.

SECTION 4. FEVER IN CHILDREN

311	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN IN 2003[1] OR LATER. (IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN IN 2003[1] OR LATER, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children less than 5 years old. (We will talk about each one separately.)		
312	NAME AND LINE NUMBER FROM 212	YOUNGEST CHILD LINE NUMBER..... ▒▒ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER..... ▒▒ NAME _____
313	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES..... 1 NO ..... 2 (GO TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) =→ DON'T KNOW..... 8	YES..... 1 NO ..... 2 (GO BACK TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) =→ DON'T KNOW..... 8
314	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'.	DAYS AGO..... ▒▒ DON'T KNOW.....98	DAYS AGO..... ▒▒ DON'T KNOW.....98
315	Did you seek advice or treatment for the fever from any source?	YES..... 1 NO ..... 2 (SKIP TO 317) =→	YES..... 1 NO ..... 2 (SKIP TO 317) =→
316	Where did you seek advice or treatment?[2] Anywhere else? RECORD ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....F OTHER PUBLIC _____G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC .....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K FIELD WORKER.....L OTHER PVT. MEDICAL _____M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....F OTHER PUBLIC _____G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC .....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K FIELD WORKER.....L OTHER PVT. MEDICAL _____M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)
316a	How many days after the fever began did you first seek advice or treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS ..... ▒▒	DAYS ..... ▒▒

[1] For fieldwork beginning in 2006, 2007, or 2008, the year should be 2001, 2002, or 2003, respectively.
[2] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
316b	Did (NAME) receive a finger stick or heal stick to test the fever/illness?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8
316c	Was a diagnostic blood test for malaria performed?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (2 or 8 THEN SKIP TO 317) =——┘	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 2 or 8 THEN SKIP TO 317) =——┘
316d	Did you request the test or was it offered to you?	OFFERED ..... 1 REQUESTED 2	OFFERED ..... 1 REQUESTED 2
316e	What type of diagnostic blood test for malaria performed?	Microscopy ..... 1 Malaria test kit/ rapid diagnostic test. 2 DON'T KNOW 8	Microscopy ..... 1 Malaria test kit/ rapid diagnostic test. 2 DON'T KNOW 8
316f	Was the result of the diagnostic blood test for malaria shared with you?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (2 or 8 THEN SKIP TO 317) =——┘	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 2 or 8 THEN SKIP TO 317) =——┘
316g	What was the result of the diagnostic blood test for malaria?	Positive for malaria ..... 1 Negative for malaria ..... 2 DON'T KNOW 8	Positive for malaria ..... 1 Negative for malaria ..... 2 DON'T KNOW 8
317	Is (NAME) still sick with a fever?	YES ..... 1 NO ..... 2 DON'T KNOW 8	YES ..... 1 NO ..... 2 DON'T KNOW 8
318	At any time during the illness, did (NAME) take any drugs for the fever?	YES ..... 1 NO ..... 2 (SKIP 344) =——┐ DON'T KNOW 8	YES ..... 1 NO ..... 2 (SKIP 344) =——┐ DON'T KNOW 8
319	What drugs did (NAME) take?[1] Any other drugs? RECORD ALL MENTIONED. ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STILL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	ANTIMALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D COARTEM / ACT ..... E OTHER ANTIMALARIAL_____ F (SPECIFY) OTHER DRUGS ASPIRIN ..... G ACETAMINOPHEN/ PARACETAMOL ..... H IBUPROFEN ..... I OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	ANTIMALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D COARTEM / ACT ..... E OTHER ANTIMALARIAL_____ F (SPECIFY) OTHER DRUGS ASPIRIN ..... G ACETAMINOPHEN/ PARACETAMOL ..... H IBUPROFEN ..... I OTHER _____ X (SPECIFY) DON'T KNOW ..... Z
320	CHECK 319: ANY CODE A-F CIRCLED?	YES ☐ NO ☐ (GO BACK TO 313 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)	YES ☐ NO ☐ (GO BACK TO 313 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)

320A	CHECK 319: SP/FANSIDAR ('A') GIVEN?	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)
321	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8

[1] Revise list of drugs as appropriate; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
322	For how many days did (NAME) take the SP/Fansidar? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... [ ] DON'T KNOW 8	DAYS ..... [ ] DON'T KNOW 8
323	Did you have the SP/Fansidar at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the SP/Fansidar first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
339a	Did you purchase the SP/Fansidar?	YES ..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
339b	How much did you pay for the SP/Fansidar?	In Kwacha [ ]	In Kwacha [ ]

324	CHECK 319: WHICH MEDICINES?	CODE 'B' CIRCLED ☐ → (SKIP TO 328) CODE 'B' NOT CIRCLED ☐	CODE 'B' CIRCLED ☐ → (SKIP TO 328) CODE 'B' NOT CIRCLED ☐
325	How long after the fever started did (NAME) first take chloroquine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
326	For how many days did (NAME) take chloroquine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ▒▒ DON'T KNOW 8	DAYS ..... ▒▒ DON'T KNOW 8
327	Did you have the chloroquine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the chloroquine first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 88
327a	Did you purchase the cholorquine?	YES ..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
327b	How much did you pay for the choloquine	In Kwacha ▒▒▒	In Kwacha ▒▒▒
328	CHECK 319: WHICH MEDICINES?	CODE 'C' CIRCLED ☐ → (SKIP TO 332) CODE 'C' NOT CIRCLED ☐	CODE 'C' CIRCLED ☐ → (SKIP TO 332) CODE 'C' NOT CIRCLED ☐
329	How long after the fever started did (NAME) first take Amodiaquine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
330	For how many days did (NAME) take Amodiaquine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ▒▒ DON'T KNOW 8	DAYS..... ▒▒ DON'T KNOW 8
331	Did you have the Amodiaquine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the Amodiaquine first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
331a	Did you purchase the Amodiaquine?	YES ..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
331b	How much did you pay for the Amodiaquine?	In Kwacha ▒▒▒	In Kwacha ▒▒▒
332	CHECK 319: WHICH MEDICINES?	CODE 'D' CIRCLED ☐ CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)	CODE 'D' CIRCLED ☐ CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)
333	How long after the fever started did (NAME) first take Quinine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
334	For how many days did (NAME) take Quinine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ▒▒ DON'T KNOW 8	DAYS..... ▒▒ DON'T KNOW 8
335	Did you have the Quinine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK:	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP 5	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP 5

	Where did you get the Quinine first?	OTHER_____ 6 (SPECIFY) DON'T KNOW 8	OTHER_____ 6 (SPECIFY) DON'T KNOW 8
335a	Did you purchase the Quinine?	YES ..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
335b	How much did you pay for the Quinine?	In Kwacha ☐☐	In Kwacha ☐☐
336	CHECK 319: WHICH MEDICINES?	CODE 'E' CIRCLED ☐ CODE 'E' NOT CIRCLED ☐ ˇ(SKIP TO 340)	CODE 'E' CIRCLED ☐ CODE 'E' NOT CIRCLED ☐ ˇ(SKIP TO 340)
337	How long after the fever started did (NAME) first take COARTEM ?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
338	For how many days did (NAME) take COARTEM ? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ☐☐ DON'T KNOW 8	DAYS ..... ☐☐ DON'T KNOW 8
339	Did you have the Coartem at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the ACT first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
339a	Did you purchase the Coartem ?	YES ..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340

339b	How much did you pay for the Coartem ?	In Kwacha ⌐▒▒|▒▒¬	In Kwacha ⌐▒▒|▒▒¬
340	CHECK 319: WHICH MEDICINES?	CODE 'F' CIRCLED ☐ CODE 'F' NOT CIRCLED ☐ (SKIP TO 344)	CODE 'F' CIRCLED ☐ CODE 'F' NOT CIRCLED ☐ (SKIP TO 344)
341	How long after the fever started did (NAME) first take (NAME OF OTHER ANTIMALARIAL)?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
342	For how many days did (NAME) take (NAME OF OTHER ANTIMALARIAL)? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ▒▒ DON'T KNOW 8	DAYS ..... ▒▒ DON'T KNOW 8
343	Did you have the (NAME OF OTHER ANTIMALARIAL) at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the (NAME OF OTHER ANTIMALARIAL) first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____6 (SPECIFY) DON'T KNOW 8
344		GO BACK TO 313 IN NEXT COLUMN, OR, IF NO MORE CHILDREN, GO TO 345.	GO BACK TO 313 IN FIRST COLUMN OF NEW QUESTIONNAIRE, OR, IF NO MORE CHILDREN, GO TO 345.
345	RECORD THE TIME.	HOUR ..... ▒▒ MINUTES ..... ▒▒	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____ DATE: _____

Consent document for the household survey.

Introduction

The National Malaria Control Centre, Ministry of Health, PATH Malaria Control and Evaluation Partnership in Africa (MACEPA), Catholic Medical Missions Board, the World Health Organization and malaria control partners want to learn how well malaria prevention program is working in Zambia. We would like to ask you some questions about bednet use in your home, and also some general questions about your child[ren]'s health.

We are also doing a survey of malaria in children. To do this, we will test children for malaria parasites in the blood. One way to test for malaria parasites in the blood includes taking a small sample of blood by fingerprick and examining under a microscope and in a laboratory. Another way is to look at anaemia (low levels of blood), by taking a small sample of blood by fingerprick and examining with a hemocue machine. The World Health Organization (WHO) has set up a guide for us to look at both. We are using this guide to help with the malaria program in Zambia.

Purpose of the survey

We want to use the WHO guide to see if your country's malaria program works. We also want to test if a communication campaign increases bednet use among children in this community. We will ask you some questions about bednet use in your home, and also about your child[ren]'s health. We will also see how common malaria is among young children in the community by testing for parasites in the blood and also by testing for low levels of blood. We will visit people in their homes and look at people that come to health facilities. This will help us learn how best to measure the effects of malaria control in the community.

Procedures

If you agree to take part, we will ask you a few questions and a nurse will take a small amount of blood from your child's finger.

We will ask you questions about bednet use in your home, and about other things that are linked to malaria. We will also ask some questions about your health and about your child[ren]'s health. This should only take about 30 minutes.

We will take only up to 5 drops of blood from your child. One drop of blood will be wiped off. The second drop of blood will be used to test for malaria in the lab using a microscope. The third drop of blood will be used to test for low levels of blood (anemia) here in the house. The fourth drop will be used for a rapid malaria diagnostic test here in the house. The remaining drop of blood will be put on paper for additional laboratory analysis to confirm the type of malaria found if needed. The last drop will be used in case the slides become damaged or unreadable and it will be discarded after the survey results has been analysed.

The results for low levels of blood and for the rapid malaria diagnostic test will be given to you today. If your child has low levels of blood, malaria or history of fever, we will give you treatment. This will be the same treatment your child would get if you went to your health center. This will cost you and your family nothing. If the nurse thinks that your child is very ill, we will give you transportation to the nearest health clinic and assure that the child is provided with the necessary health care.

Lab test results will be ready after one week. If your child has malaria, a survey staff member will return to your house to give treatment for malaria to your child. This will only happen if your child has not already been treated today. Even if you do not wish to take part, you can still ask to see the nurse and get the correct treatment. Even if you do not agree to take part, if your child is ill, you should visit the nearest health clinic if your child is not better in 3 days or is worse over time.

Risks and Benefits

Your child will feel a pinch that lasts a few seconds when we take the blood tests. For any malaria health problem that we find, the nurse will give the treatments that the Ministry of Health suggests.

These drugs are proven safe and effective but any drugs can cause side effects in a small number of patients. The nurse will discuss these with you.

Voluntariness
It is your choice to be in this survey. It will not affect the care that the nurse will give you or your child[ren] should you wish to receive it. If you do agree to take part, your answers to all questions and your child's test results will be kept private to the extent the law allows. If you agree to take part, you can also decide not to answer any of the questions that you do not want to, and you can refuse the blood tests.

If you have any questions or clarification pertaining to this survey please feel free to ask the field nurse or the medical officer in charge in the field whose name and contact information is given below. (field nurse name and telephone here) or Study Coordinator: Dr. Mulakwa Kamuliwo, Acting Coordinator, National Malaria Control Centre, Chainama Hospital College Grounds, Lusaka, Zambia, Tel: 282455; Fax: 282427.

Thank you very much for your time. Would you like to take part in this survey?

Statement of Parental Permission for malaria surveillance (signature or thumbprint required)
The above has been read to me, and I agree to let my child take part.

Signature: _____ Date: _____

Thumb print:

Participant's name: _____

For persons who cannot sign
The above consent was read and the person agreed to take part.

Signature: _____ Date: _____

Witness's name: _____

Statement of consent (signature or thumbprint required):
The above has been read to me and I agree to take part.

Signature: _____ Date: _____

Thumb print:

Participant's name: _____

For persons who cannot sign
The above consent was read and the person agreed to take part.

Signature: _____ Date: _____

Witness's name: _____

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