ZAMBIA NATIONAL MALARIA INDICATOR SURVEY 2012

Government of the Republic of Zambia, Ministry of Health

Zambia National Malaria Indicator Survey 2012

This report summarizes the findings of the 2012 Zambia National Malaria Indicator Survey carried out in April and May 2012 by the Ministry of Health, Central Statistics Office, PATH Malaria Control and Evaluation Partnership in Africa (MACEPA), the United States President's Malaria Initiative, the World Bank, UNICEF, and the World Health Organization.

Contents

Acronyms

ANC	Antenatal clinic
ART-LUM	Artemether-lumefantrine
CDC	US Centers for Disease Control and Prevention
CHW	Community health worker
COMBOR	Community Malaria Booster Response
CSA	Census supervisory areas
CSO	Central Statistical Office
DFID	UK Department for International Development
DHS	Demographic and Health Survey
GFATM	The Global Fund to Fight HIV, Tuberculosis and Malaria
Hb	Haemoglobin
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
NMCP	National Malaria Control Programme
NMSP	National Malaria Strategic Plan
PATH	Program for Appropriate Technology in Health
PDA	Personal digital assistant
PMI	US 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
ZISSP	Zambia Integrated Services Strengthening Program

Acknowledgments

This report presents the results of the Zambia National Malaria Indicator Survey 2012, a comprehensive, nationally representative household survey designed to measure progress toward achieving the goals and targets set forth in the National Malaria Strategic Plan 2011–2015. 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 Zambia Integrated Services Strengthening Program (ZISSP); the United States (US) President's Malaria Initiative (PMI); the World Bank; Comprehensive HIV AIDS Management Programme (CHAMP); First Quantum Minerals, Ltd.; and the World Health Organization (WHO).

At the Ministry of Health, Dr Peter Mwaba, Permanent Secretary, and Dr Elizabeth Chizema Kawesha, Director of Public Health and Research, provided overall survey leadership and guidance. At the NMCC, Dr Mulakwa Kamuliwo, Deputy Director, Public Health and Research, Malaria; Dr Chibesa Wamalume, Case Management Officer; Moonga Hawela, Chief Parasitologist; Mercy Mwanza, Surveillance and Information Officer; Busiku Hamainza, Operations Research Officer; Pauline K. Wamalume, Information Education Communication Officer; and Felix Ngoma, 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, John Kalumbi, Director, and Godwin Sichone, 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, Chris Lungu, Kafula Silumbe, Marie Reine Rutagwire, Muleba Mwatafwali, Sosenna Assefa, and Matches Mulenga provided logistics support, survey organization, accounting, support for design and analysis, and report writing. Manny Lewis and and Laura Newman edited and formatted the report. From PMI, Allen Craig of the US 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 ZISSP, Brian Chirwa, Patrick Chewe, and Dayton Makusa provided coordination during the survey planning process and technical support during training and field work. Fred Masaninga from WHO provided support for activities, 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.

Dr. Peter Mwaba
Permanent Secretary
Ministry of Health

Preface

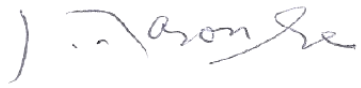
The success of the malaria control programme in Zambia continues to inspire similar efforts across the region. Through our strong partnerships and focused efforts, malaria control remains a priority of the Ministry of Health. Key to the success of the program has been the continued emphasis on measurement of progress around key indicators. Measurement is critical to inform our decisions and donors as we continue to strive for malaria-free areas in the country.

The Zambia National Malaria Indicator Survey 2012 represents the fourth large-scale effort to benchmark progress of malaria control efforts—interventions and disease burden—since the launch of the second National Malaria Strategic Plan in 2006–2010. Now well into our third National Malaria Strategic Plan 2011–2015, Zambia continues to lead the way in the African region with four successive malaria indicator surveys.

Managing a malaria control programme is a very dynamic process and the Zambia programme is still heavily dependent on donor aid for its success. In 2010, we reported on the challenges of delayed procurements and reduced insecticide-treated net (ITN) coverage in many malaria-endemic areas of the country. Consequently, in late 2010 and 2011 we prioritized deliveries of ITNs to underserved areas. In this report we are pleased to see progress from these decisions as well as in many other key strategic areas.

Despite these successes, the malaria parasite continues to challenge us. This demands that we continue our efforts to exploit its weaknesses and not look away, but stand firm and continue the assault in new and innovative ways.

With our persistence and good will, we will win this battle. With our emphasis on measurement of our progress and evidenced-based decision-making, we will continue the good fight until we achieve our goal of a malaria-free Zambia.



Hon. Dr. Joseph Kasonde, MP
Minister of Health

Executive summary

The Ministry of Health, along with its partners, through the National Malaria Control Programme continues to provide quality malaria control prevention and treatment services in an aggressive approach to reducing malaria and malaria-related burden. Monitoring the status of the delivery of these services is critical for understanding progress in the fight against malaria. The Zambia Government and its partners continue to be a driving force for malaria control in the region, and these survey results indicate both the tremendous progress and the challenges that have occurred during the last two to three years.

This report presents the results of the Zambia National Malaria Indicator Survey (MIS) 2012, a nationally representative household survey assessing coverage of key malaria interventions and malaria-related burden among children under age five years. The 2012 MIS report also compares results from previous surveys conducted in 2006–2010. The 2012 survey was developed and conducted by the Ministry of Health and several key malaria partners including the Central Statistical Office (CSO), the Malaria Control and Evaluation Partnership in Africa (MACEPA, a programme at PATH), the World Health Organization (WHO), the United States President's Malaria Initiative (PMI), the Zambia Integrated Services Strengthening Program (ZISSP), the World Bank, and the University of Zambia.

The MIS was based on a nationally representative two-stage cluster sample of 4,000 households surveyed from 160 standard enumeration areas randomly selected from all ten provinces to provide representative national and urban and rural estimates. Field work was conducted during April and May 2012 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 First Response® Malaria AG HRP2 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 2012 MIS indicate 72% of Zambian households have at least one mosquito net, and 68% of households have at least one ITN, representing an increase from 2010; substantial progress was made in replenishing ITNs in several provinces that showed decreased coverage in 2010.

Forty-nine percent (49%) of all Zambians slept under a mosquito net the night before the survey, an increase from 2010 despite challenges in increasing overall net availability. Over seventy-five percent (75%) of children under age five years who slept under a net the night before the survey slept under a treated net in Luapula and Eastern provinces, two of the most malarious regions in the country. The number of districts included in the IRS programme increased from 36 to all districts since the 2010 survey, with an increasing number of rural, more malarious areas targeted for spraying. Nationally, in 2012, 25% of households in Zambia reported being sprayed. Seventy four percent (74%) of households nationally reported having either an ITN or being sprayed in the past year.

Nearly three-quarters (72%) of pregnant women reported at least two doses of intermittent preventive treatment (IPT) during recent pregnancies and over half reported at least three doses of IPT. Further, the night before the survey, 58% of all pregnant women 15 to 49 years slept under an ITN.

Since 2004, the national first-line antimalarial treatment has been artemether-lumefantrine (ART-LUM). From 2010 to 2012, reported fever prevalence among children was reduced, and even more of these febrile children who received an antimalarial received the recommended ART-LUM for treatment. More than half of these febrile children seeking care

reported a finger stick, suggesting tremendous progress in scaling diagnostic testing services for malaria.

Malaria parasite prevalence was found to be 14.9%, and severe anaemia prevalence was found to be 6.8% among children under age five years. This represents a slight decrease in both measures since 2010 and a general trend in decreasing malaria burden nationally since 2006.

The 2012 MIS 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 2012 and beyond.

Chapter 1: Introduction

Zambia has made great strides in improving the coverage and extent of malaria control services offered throughout the country over the past decade. Since the second National Malaria Strategic Plan 2006–2010, the efforts of the Government of the Republic of Zambia, in conjunction with many partners, have been focused on scaling up malaria control interventions, including prevention and treatment services. 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 subsequent National Development Plans and National Health Strategic Plans. In line with these efforts, the Ministry of Health (MOH), through the National Malaria Control Centre (NMCC), has developed a further National Malaria Strategic Plan (NMSP) 2011–2015, aimed at significantly sustaining the gains achieved during initial scale-up efforts of malaria control interventions toward the achievement of the national vision of "a malaria-free Zambia."

The NMCC, in collaboration with its 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 Roll Back Malaria (RBM) baseline and follow-up surveys in 2001 and 2004, NetMark evaluation surveys in 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 and 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 and 4% in 2008) among children less than five years of age.

The 2006, 2008, and 2010 surveys 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 2012 Zambia MIS was to evaluate progress toward achieving the goals and targets set forth in the NMSP 2011–2015. The specific objectives were:

1. To collect up-to-date information, building on the experience of the MIS 2006, 2008, and 2010 on coverage of the core malaria interventions included in the NMSP 2011–2015.
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 2012 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. An additional oversample of rural areas aligned with IRS enumerated areas was also included in the sample. This was done to aid in evaluating the impact of IRS.

Zambia is administratively divided into 10 provinces. Each province is in turn subdivided into districts. Each district is further subdivided into constituencies and wards. In total, Zambia has 74 districts, 150 constituencies, and 1,421 wards. For statistical purposes each ward is subdivided into census supervisory areas (CSAs) that, in turn, are subdivided into standard enumeration areas (SEAs). The SEAs, which are geographical areas classified as either rural or urban, have information on the number of households and the population size. This demarcation is done through a mapping exercise.

The MIS 2012 was based on the sampling frame from the 2010 census of population and housing conducted by the Central Statistics Office (CSO 2012). The sampling frame has 25,631 SEAs and 2,815,897 households. The number of households was used as a measure of size for selecting primary sampling units.

Sample sizes have been calculated with the assumption that future cross-sectional surveys will be conducted for comparison with these results. Sample size determination is based on an expected reduction in parasitaemia levels among rural populations from the 2010 MIS results and according to the MIS Sampling Guidelines documentation (RBM 2005). The MIS conducted in Zambia in 2010 provided a national severe anaemia (measured as haemoglobin less than 8 g/dl) prevalence of 9% and a malaria parasite (measured by slide microscopy) prevalence of 16% for children under age 5. For rural areas, the estimates were 10.2% and 20.4%, respectively. With an estimated 77% of households with at least one child under age 5 (and assuming 46% with a children 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 10% relative standard error requires at least 2,600 households in the rural domain.

The 2012 MIS sampled additional rural households within IRS-targeted areas identified through enumerations carried out by NMCC since 2008. Including these additional

households helped determine the extent to which IRS has benefited communities in Zambia through reductions in malaria burden. IRS oversampling was drawn from among the 836 clusters from rural, IRS-targeted areas of districts so that at least 600 total households (24 SEAs) would be included. The remaining allocation of MIS 2012 SEAs were assigned to an urban domain, which accounted for an additional 800 households (32 SEAs).

To achieve the sample's total requirement of 4,000 households, 25 households were selected from each of 160 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) fitted with geo-positioning units. All households within an SEA were digitally listed, 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 2012: 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 level, 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 women's 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. It included the following topics:

- 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, only 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)—First Response® Malaria AG HPR2, Premier Medical Corp., Ltd. A final drop was placed on 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) guidelines. Children with a positive RDT result who did not clinically fit 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 who were 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 8,000 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. Dell Axim X51s PDAs were used for data collection. 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, describing 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 2012. 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 SEAs. These health professionals, primarily female registered nurses, were responsible for conducting household interviews. Teams were assigned to each of the ten provinces, with additional teams allocated for working among the larger provinces as the selection determined.

Training was conducted in Lusaka during the last two weeks of March 2012. 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 starting 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 (Ref: 002-03-12), on behalf of the MOH in Zambia, PATH on behalf of the MACEPA project, and the CDC reviewed and either approved the protocol or approved it as non-research evaluation.

Chapter 2: Characteristics of households and women respondents

Characteristics of households

The Zambia MIS 2012 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 1 presents the de facto household population by five-year age groups according to sex and residence. The data show that there are slightly more women in Zambia than men, comprising 52.4% and 47.6%) of the population, respectively. The population under age 15 years makes up about 46.8% 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 1**), especially in urban areas. The gap indicates there are more women than men in both of these age groups.

Table 1. 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 2012)

	Urban			Rural			Total		
Age	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0–4	16.3	15.5	15.9	23.2	21.0	22.0	20.4	18.7	19.5
5–9	12.1	13.3	12.7	16.5	16.0	16.3	14.7	14.9	14.8
10–14	12.3	12.9	12.6	11.9	12.8	12.4	12.1	12.8	12.5
15–19	10.9	10.4	10.7	7.0	7.7	7.4	8.6	8.9	8.7
20–24	8.1	10.7	9.5	6.2	8.0	7.2	7.0	9.2	8.1
25–29	9.1	10.3	9.7	6.6	6.7	6.7	7.8	8.2	7.9
30–34	7.3	7.2	7.3	6.1	6.6	6.4	6.6	6.9	6.8
35–39	6.7	5.8	6.2	5.7	4.9	5.3	6.1	5.3	5.7
40–44	5.6	3.2	4.3	4.6	3.4	4.0	5.0	3.3	4.1
45–49	3.7	2.9	3.3	3.2	2.9	3.1	3.4	2.9	2.8
50–54	2.9	3.4	3.2	2.5	2.6	2.6	2.7	2.9	2.8
55–59	2.5	1.6	2.0	1.6	1.8	1.7	2.0	1.7	1.8
60–64	1.2	1.1	1.1	1.7	1.5	1.6	1.5	1.3	1.4
65–69	0.4	0.5	0.4	1.0	1.6	1.3	0.7	1.1	0.9
70–74	0.4	0.5	0.4	0.7	0.9	0.8	0.6	0.7	0.7
75–79	0.4	0.4	0.4	0.7	0.9	0.8	0.6	0.7	0.6
80+	0.2	0.2	0.2	0.7	0.6	0.6	0.5	0.4	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

continued

Table 1. 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 2012)

	Urban			Rural			Total		
Age	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***	***Male***	***Female***	***Total***
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number	1,587	1,838	3,425	6,467	7,036	13,503	8,054	8,874	16,928

Figure 1. Age pyramid of sampled population of Malaria Indicator Survey (Zambia 2012)

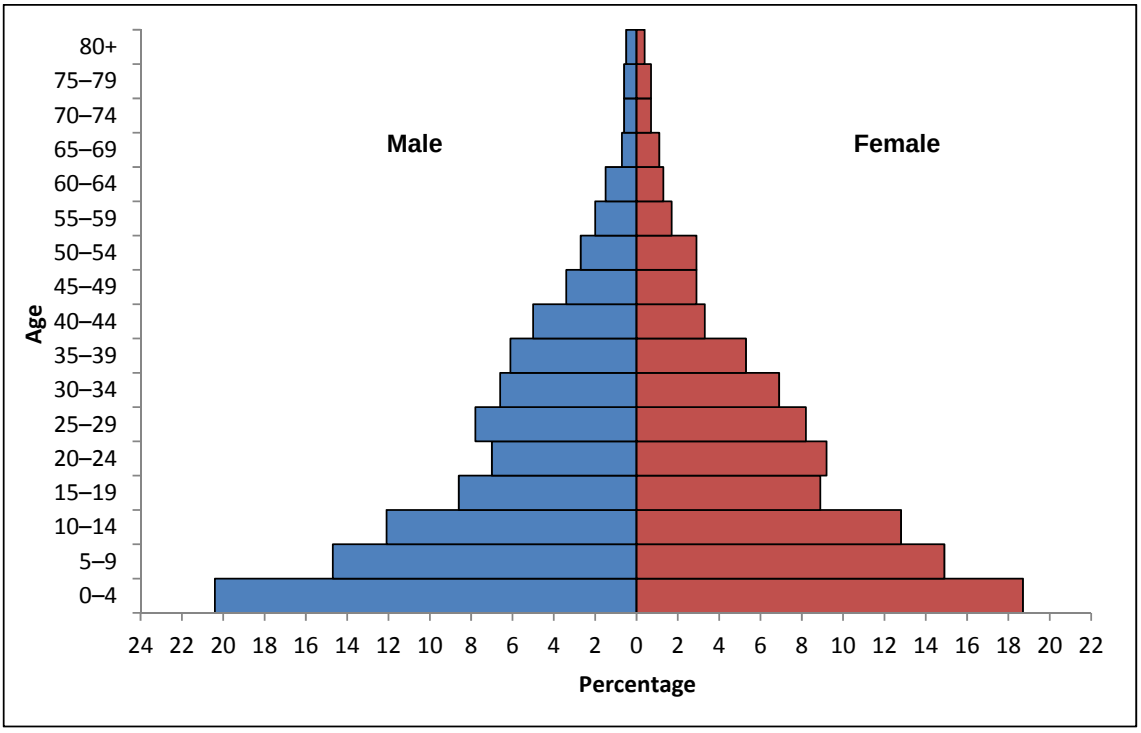


Table 2 presents the household composition among those surveyed. The percent of households headed by men was similar for both rural and urban areas. In the distribution of the number of usual household members, rural and urban areas are also very similar, except for households with two or three members.

Table 2. Household composition
Percent distribution by sex of head of household and by household size, according to residence (Zambia 2012)

	Residence		
Characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Sex of head of household			
Male	75.6	74.4	74.9
Female	24.4	25.6	24.1
Number of usual members			
1	8.9	9.6	9.3
2	11.5	12.9	12.3
3	13.5	15.1	14.4
4	18.3	17.8	18.0
5	15.6	14.9	15.2
6	12.7	12.1	12.4
7	9.3	7.6	8.3
8	5.1	5.1	5.1
9+	5.0	5.0	5.0
Total	100.0	100.0	100.0
Number	750	3,050	3,800

Table 3 shows that nearly two-thirds (63.0%) of urban households reported having electricity, compared to 5.3% of rural households. Nationally, the most common sources of drinking water were unprotected wells (23.4%), public taps or standpipes (14.7%), protected wells (13.4%), and water piped into yard or plot (13.3%). In rural areas, the most common sources of drinking water were unprotected wells (33.3%) and tube wells or boreholes (19.0%), while urban households mostly reported using water sources piped into yard or plot (30.7%), public taps or standpipes (29.3%), or water piped into the dwelling (19.1%). The most common toilet facilities reported in households were open pits or pit latrines without slabs (37.3%) or pit latrines with slabs (23.4%). The majority of both urban and rural households surveyed had earth, sand, or dung floors (55.4%) or cement floors (40.5%).

Table 3. Household characteristics
Percent distribution of households by household characteristics, according to residence (Zambia 2012)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Electricity			
Yes	63.0	5.3	28.7
No	37.0	94.7	71.3
Source of drinking water			
Piped into dwelling	19.1	0.4	7.9
Piped into yard/plot	30.7	1.4	13.3
Public tap/standpipe	29.3	4.8	14.7
Tube well or borehole	2.0	19.0	12.1
Protected well	8.0	17.1	13.4
Unprotected well	8.8	33.3	23.4
Protected spring	0.2	0.9	0.6
Unprotected spring	0.3	10.7	6.4
Rainwater	0.0	0.1	0.0
Surface water (river/dam/lake/spring/pond)	1.1	12.0	7.6
Bottled water	0.0	0.0	0.0
Other	0.5	0.4	0.4
Sanitation facilities			
Flushed to pipe sewer system	21.4	0.6	9.0
Flushed to septic tank	12.7	0.5	5.5
Flushed to pit latrine	1.2	0.1	0.5
Flushed to somewhere else	0.3	0.1	0.2
Ventilated improved pit latrine	3.5	0.9	1.9
Pit latrine with slab	39.9	12.1	23.4
Pit latrine without slab/open pit	17.7	50.6	37.3
Hanging toilet/hanging latrine	0.0	0.4	0.3
No facility/bush/field	2.9	33.8	21.3
Other	0.4	0.8	0.6
Flooring material			
Earth/sand/dung	13.9	83.6	55.4
Wood planks	0.0	0.0	0.0
Parquet or polished wood	0.0	0.0	0.0
Vinyl or asphalt strips	0.4	0.0	0.2
Ceramic tiles	5.5	0.2	2.4

Table 3. Household characteristics
Percent distribution of households by household characteristics, according to residence (Zambia 2012)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Flooring material (continued)			
Cement	77.9	15.0	40.5
Carpet	0.8	0.2	0.4
Other	1.5	1.0	1.1
Total	100.0	100.0	100.0
Number	750	3,050	3,800

Table 4 shows that nearly 60% of Zambian households possess a radio. Just over half (50.5%) of households have either a landline telephone or a cell phone, including more than three-quarters (76.1%) of households in urban areas.

Table 4. Household durable goods, livestock, and land ownership
Percent of households possessing various durable consumer goods, any livestock, and land ownership, by residence (Zambia 2012)

	Residence		
Household characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Radio	77.9	47.4	59.8
Television	65.6	13.3	34.5
Telephone or cell phone	76.1	33.1	50.5
Refrigerator	41.9	2.7	18.6
Bicycle	46.8	20.4	36.1
Motorcycle	1.4	0.7	1.0
Car/truck	10.2	1.3	4.9
Any livestock	87.4	42.4	60.6
Owns land	76.9	13.6	39.2
None of the above	23.1	3.4	15.4
Number	750	3,050	3,800

Wealth index

The “wealth index” is used to present results in this survey and is a proxy measure of the relative standard of living. In the MIS 2012, the wealth index is based on the reported household ownership of consumer goods and assets, household characteristics such as the type of household toilet facilities and available source of drinking water, and other characteristics that may relate to the household’s relative socioeconomic status. The wealth

index was created by assigning a factor weight to each asset or characteristic generated through principal component analysis. The factors were summed for each household, creating a total score, which was subsequently ranked and divided into quintiles from one (lowest) to five (highest). The index was based on data from each household for the entire sample and the wealth index is presented for each set of indicators in the report.

Characteristics of women respondents

Eligible women ages 15 to 49 years were interviewed using the women's questionnaire. **Table 5** shows that a majority (58.5%) of women were ages 15 to 29 years, and more than half of them lived in rural areas (52.6%). More than half of the women reported less than a secondary-level education (56.0%). The women surveyed were mainly Protestants (62.5%) or Catholics (19.5%), and women most often cited belonging to either the Bemba (33.4%), Nyanja (13.7%), or Tonga (12.6%) ethnic groups.

Table 5. Background characteristics of women respondents
Distribution of women ages 15 to 49 years by background characteristics (Zambia 2012)

Characteristic	Percent	Number
	(1)	(2)
Age		
15–19	17.8	581
20–24	21.5	657
25–29	19.2	586
30–34	16.2	527
35–39	11.9	380
40–44	7.5	276
45–49	5.9	193
Residence		
Rural	52.6	2,450
Urban	47.4	750
Province		
Central	6.4	306
Copperbelt	17.8	318
Eastern	12.8	512
Luapula	7.8	366
Lusaka	19.5	384
Muchinga	6.6	193
Northern	8.5	373
North-Western	4.8	181
Southern	12.2	392
Western	3.7	175
Education		
No education	10.3	450
Primary	45.7	1,678

continued

Table 5. Background characteristics of women respondents
Distribution of women ages 15 to 49 years by background characteristics (Zambia 2012)

Characteristic	Percent	Number
	(1)	(2)
Secondary	39.2	974
Higher	4.8	98
Religion		
Catholic	19.5	635
Protestant	62.5	1,950
Muslim	0.3	7
Traditional	0.4	17
Other	17.2	591
Ethnic group		
Bemba	33.4	1,065
Tonga	12.6	437
North-Western	8.0	243
Baroste	6.4	227
Nyanja	13.7	382
Mambwe	2.9	87
Tumbuka	5.6	172
Other	17.4	587
Total	100.0	3,200

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 in rural areas, and 2) IRS, targeted 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 ITN distribution is to have universal coverage for all people where the potential exists for malaria transmission. 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 campaigns, malaria in pregnancy, equity which targets vulnerable groups (orphans, aged, chronically ill), Community Malaria Booster Response (COMBOR), Malaria School Health Programme, and commercial market distribution for sustainability. The mass distribution campaigns have been implemented since late 2005 with expected replacements after approximately three years of use. These campaigns have been conducted in all districts in all ten provinces over the past several years as funding for ITNs has become available.

The ownership and use of mosquito nets, whether insecticide-treated or not,[1] is the primary prevention strategy for reducing malaria transmission in areas of Zambia where IRS is not targeted. **Table 6** shows that 72.1% of households in Zambia had a mosquito net, with 69.5% of households having a net that had been treated with insecticide at some time. More importantly, 68.1% of households had an ITN and 56.9% had more than one ITN. The average number of ITNs per household was 2.4. Ownership of nets (all categories) was typically higher in rural than urban areas, suggesting the prioritization of rural areas through mass distribution has been largely successful. For example, average number of ITNs per urban household was 2.10, compared to 2.56 in rural areas. In Luapula Province, 93.5% of households reported having at least one mosquito net, and 90.0% of households reported owning at least one ITN. This is the highest percentage of mosquito net and ITN ownership reported among the provinces, owing partly to distribution efforts in 2011 by STEPS-OVC and the MOH of ITNs provided by the UK Department for International Development (DFID). Northern and Eastern provinces also benefited from large ITN distributions in 2011, distributed by the MOH, STEPS OVC, and other local partners, with ITNs supplied by financing from the Global Fund to Fight HIV, TB and Malaria (GFATM) and the World Bank.

Malaria control programme partners place the largest emphasis of ITN distribution on the mass distribution strategy. This promotes full coverage of vulnerable populations, such as children and pregnant women, but also seeks to prevent transmission among other household members. The mass distribution is a 'pro-poor' strategy in that poorer households reported larger number of ITNs across all indicators of ownership than wealthier households.

[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 6. 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 2012)

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	67.0	56.7	2.32	64.4	54.1	2.19	62.3	52.2	2.10	750
Rural	75.6	62.8	2.68	73.0	61.0	2.59	71.9	60.2	2.56	3,050
Province										
Central	58.6	45.7	1.73	55.7	42.7	1.56	55.7	42.7	1.56	241
Copperbelt	68.4	60.3	2.40	68.1	60.2	2.39	62.4	55.4	2.39	358
Eastern	88.0	80.1	3.52	87.6	79.7	3.51	87.5	79.5	3.50	571
Luapula	93.5	85.3	3.88	90.2	82.6	3.76	90.0	82.6	3.76	410
Lusaka	58.1	47.7	1.87	55.8	44.9	1.74	55.4	44.6	1.74	416
Muchinga	74.3	65.5	2.75	62.7	54.0	2.25	62.2	53.6	2.23	254
Northern	83.9	69.0	3.03	83.1	69.0	3.01	83.1	69.0	3.01	415
North-Western	77.8	67.1	2.77	77.8	67.1	2.77	77.8	67.1	2.77	212
Southern	68.3	46.5	2.03	65.3	45.3	1.96	63.7	43.5	1.88	506
Western	63.2	48.7	2.01	55.9	45.4	1.84	51.9	41.9	1.70	242

continued

Table 6. 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 2012)

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	76.5	64.8	2.66	74.5	63.4	2.61	73.6	62.8	2.58	759
Second	76.3	61.2	2.59	73.9	59.8	2.52	72.6	58.7	2.48	763
Middle	71.3	60.5	2.51	67.6	57.7	2.40	66.7	56.6	2.35	758
Fourth	71.3	57.0	2.46	68.3	55.0	2.36	66.9	53.8	2.30	758
Highest	69.3	59.8	2.51	67.0	57.3	2.37	65.1	55.6	2.30	762
Total	72.1	60.3	2.53	69.5	58.2	2.43	68.1	56.9	2.38	3,800

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

Table 7. Household possession of long-lasting insecticidal nets (LLINs)
Percentage of households with at least one and more than one LLIN, and average number of LLINs per household, by background characteristics (Zambia 2012)

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	59.1	49.3	1.99	750
Rural	71.5	59.8	2.55	3,050
Province				
Central	55.7	42.7	1.54	241
Copperbelt	52.9	47.0	1.86	358
Eastern	87.4	79.5	3.50	571
Luapula	90.0	82.6	3.76	410
Lusaka	55.4	44.6	1.73	416
Muchinga	62.2	53.6	2.23	254
Northern	83.1	67.0	3.01	415
North-Western	77.8	67.1	2.77	212
Southern	63.6	43.3	1.88	506
Western	51.4	41.6	1.69	242
Wealth index				
Lowest	73.6	62.8	2.58	759
Second	72.5	58.7	2.48	763
Middle	64.8	55.0	2.30	758
Fourth	64.6	51.8	2.23	758
Highest	62.7	53.4	2.21	762
Total	66.5	55.6	2.32	3,800

[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 2011–2015 set targets of 100% coverage and 85% usage 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 2012, the use of ITNs was identified in each household by means of a complete net roster. The net roster identifies and lists each mosquito net available in the house, asks questions to ascertain its treatment status, and then asks about each individual that slept under that net the night before the survey. From this net roster method, the questionnaire gathers data on the use of nets the night before the survey for children, pregnant women, and all other household members.

Table 8 presents information on the use of mosquito nets by children. The results show that 59.9% of children under age five years were reported to have slept under a mosquito net the night before the survey, and 57.0% 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 2**). This trend has been consistent as ITN use has increased among children under five over the past several years. Usage of ITNs was higher for children in rural areas (60.1%) than in urban areas (50.9%). 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 more likely to have slept under ITNs than children in the least poor areas. For example, 64.9% of children in the lowest wealth quintile slept under an ITN compared to 53.3% in the highest quintile.

Eastern, Luapula, and Northern provinces reported the highest percentage of children sleeping under ITNs at 79.9%, 77.6%, and 65.0%, respectively. Lusaka and Southern provinces reported the lowest percentage of ITN use among children at 40.5% and 43.0%, respectively.

Considering only households with at least one mosquito net, use of ITNs among children under age five was 71.8% (**Figure 4**). 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 barrier to reaching optimal levels of ITN use among children under age five years, although the situation is improving as availability of ITNs at household level increases.

Figure 2. Insecticide-treated net (ITN) use among children under age five years by age (Zambia 2012)

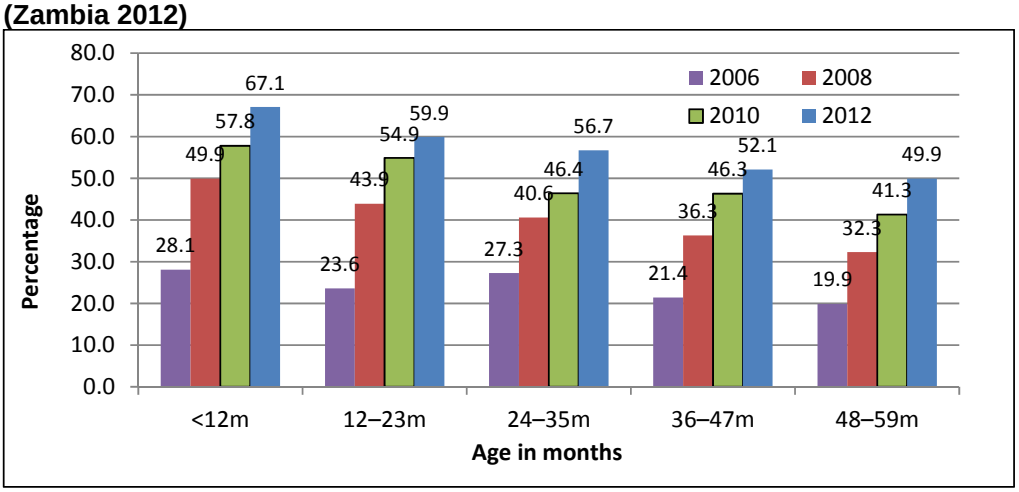


Table 8. Use of mosquito nets by children
Percentage of children under age five years who, the night before the survey, slept under a mosquito net, slept under an ever-treated net, and slept under an insecticide-treated net (ITN), by background characteristics (Zambia 2012)

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	69.0	67.8	67.1	674
1	63.7	61.2	59.9	681
2	60.2	57.7	56.7	684
3	55.1	52.8	52.1	744
4	52.5	51.0	49.9	668
Sex				
Male	59.0	57.7	56.6	1,721
Female	60.9	58.3	57.5	1,730
Residence				
Urban	55.7	52.8	50.9	522
Rural	62.0	60.6	60.1	2,929
Province				
Central	56.1	53.2	53.2	304
Copperbelt	60.5	59.7	54.9	154
Eastern	80.8	80.3	79.9	424
Luapula	79.8	77.8	77.6	402
Lusaka	43.0	40.5	40.5	274
Muchinga	60.4	51.1	51.1	235
Northern	65.5	65.0	65.0	484
North-Western	55.9	55.9	44.1	264
Southern	44.5	43.7	43.0	452
Western	52.0	46.8	45.1	226
Wealth index				
Lowest	66.8	65.4	64.9	738
Second	60.5	59.6	59.1	762
Middle	57.7	56.2	55.2	751
Fourth	59.1	56.8	55.9	664
Highest	57.6	54.7	53.3	536
Total	59.9	58.0	57.0	3,451

[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 percentage of all women ages 15 to 49 years and pregnant women who reported sleeping under mosquito nets the night before the survey. More than half (58.2%) of all women ages 15 to 49 slept under a mosquito net the night before the survey, and 54.3% slept under an ITN. For pregnant women, the percentages that slept under mosquito nets and ITNs were 61.7% and 58.2%, respectively.

Rural women were more likely to sleep under an ITN (60.2%) than urban women (47.6%). The same trend was observed among pregnant women; more rural pregnant women reported having slept under both a net and a treated net than urban pregnant women.

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

The percentage of pregnant women who slept under an ITN the night before the survey was higher in the lowest wealth quintile than in the highest quintile (74.8% and 45.1%, respectively).

Table 9. 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 2012)

	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	62.9	61.0	60.2	2,678	63.5	61.3	60.9	283
Urban	53.0	50.0	47.6	875	57.6	55.7	52.3	47
Province								
Central	50.3	46.5	46.5	355	56.4	38.8	38.8	33
Copperbelt	57.0	56.4	50.9	374	49.5	48.5	42.4	30
Eastern	74.9	74.2	74.0	547	88.8	88.8	88.8	52
Luapula	85.1	81.2	80.9	396	82.1	82.1	82.1	51
Lusaka	42.8	50.2	39.9	413	46.9	46.9	46.9	22
Muchinga	58.3	48.3	47.8	226	68.7	58.2	58.2	27
Northern	70.1	69.5	69.5	271	55.5	55.5	55.5	50
North-Western	64.5	63.6	63.6	124	72.9	72.9	72.9	21
Southern	47.5	45.7	43.4	445	45.8	45.8	43.2	31
Western	48.5	45.7	43.2	206	47.7	47.7	47.7	13
Wealth index								
Lowest	65.8	64.1	63.3	637	77.9	74.8	74.8	77

continued

Table 9. 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 2012)

	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)
Second	64.5	62.7	61.4	638	63.3	59.9	59.9	72
Middle	59.3	57.4	56.2	667	60.4	59.2	57.6	64
Fourth	57.0	54.3	53.3	717	60.7	60.7	60.7	70
Highest	54.2	51.4	49.3	894	51.8	49.0	45.1	47
Total	58.2	55.8	54.3	3,553	61.7	59.5	58.2	330

[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.

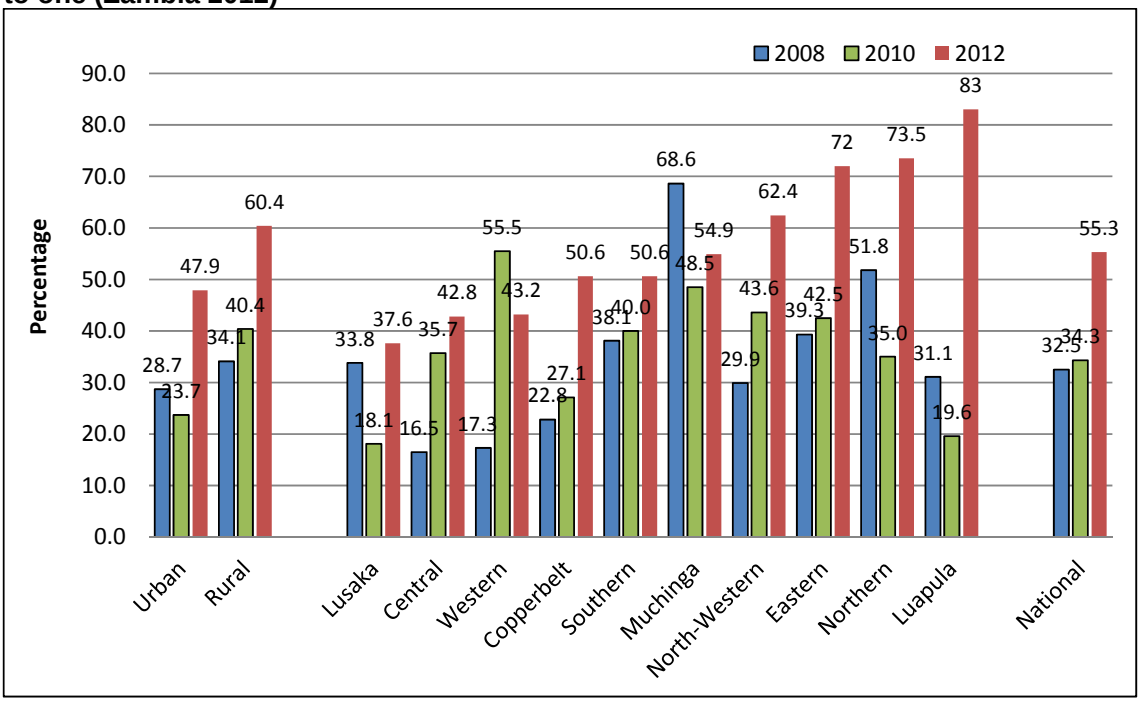
Coverage of mosquito nets and insecticide-treated nets among household members

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 to cover all sleeping spaces in households 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 3 presents the percentage of households achieving a one-to-one ratio of ITNs to sleeping spaces. Nationally, 55.3% of households reported having enough ITNs to cover all household sleeping spaces; rural areas reported far greater coverage of all sleeping spaces compared to urban areas (60.4% versus 47.9%, respectively). By province, Luapula showed the highest full coverage potential of sleeping spaces, reporting 83.0% of households with sufficient ITNs to cover all sleeping spaces. This is remarkable progress from 2010. Mass distribution campaigns—including household follow-ups to ensure ITNs were hung—have contributed greatly to increase the full coverage indicators. On the low end, Lusaka, Central, and Western provinces reported less than half of their households having sufficient ITNs to cover all sleeping spaces.

Figure 3. Percentage of households with an ITN-to-sleeping-space ratio of at least one to one (Zambia 2012)



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 10** shows that 48.9% of household members slept under an ITN the night before the survey. Slightly more females reported sleeping under ITNs than males (50.5% versus 47.0%, respectively) and more household members living in rural areas reported sleeping under ITNs than in urban areas (53.3% versus 42.5%, respectively). The latter is affected by the overall availability of more ITNs in rural areas than urban areas. Among the provinces, Eastern, Luapula and Northern provinces had the highest reported ITN use, while Lusaka, Southern, Central and Western provinces had the lowest.

Table 10. 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 2012)

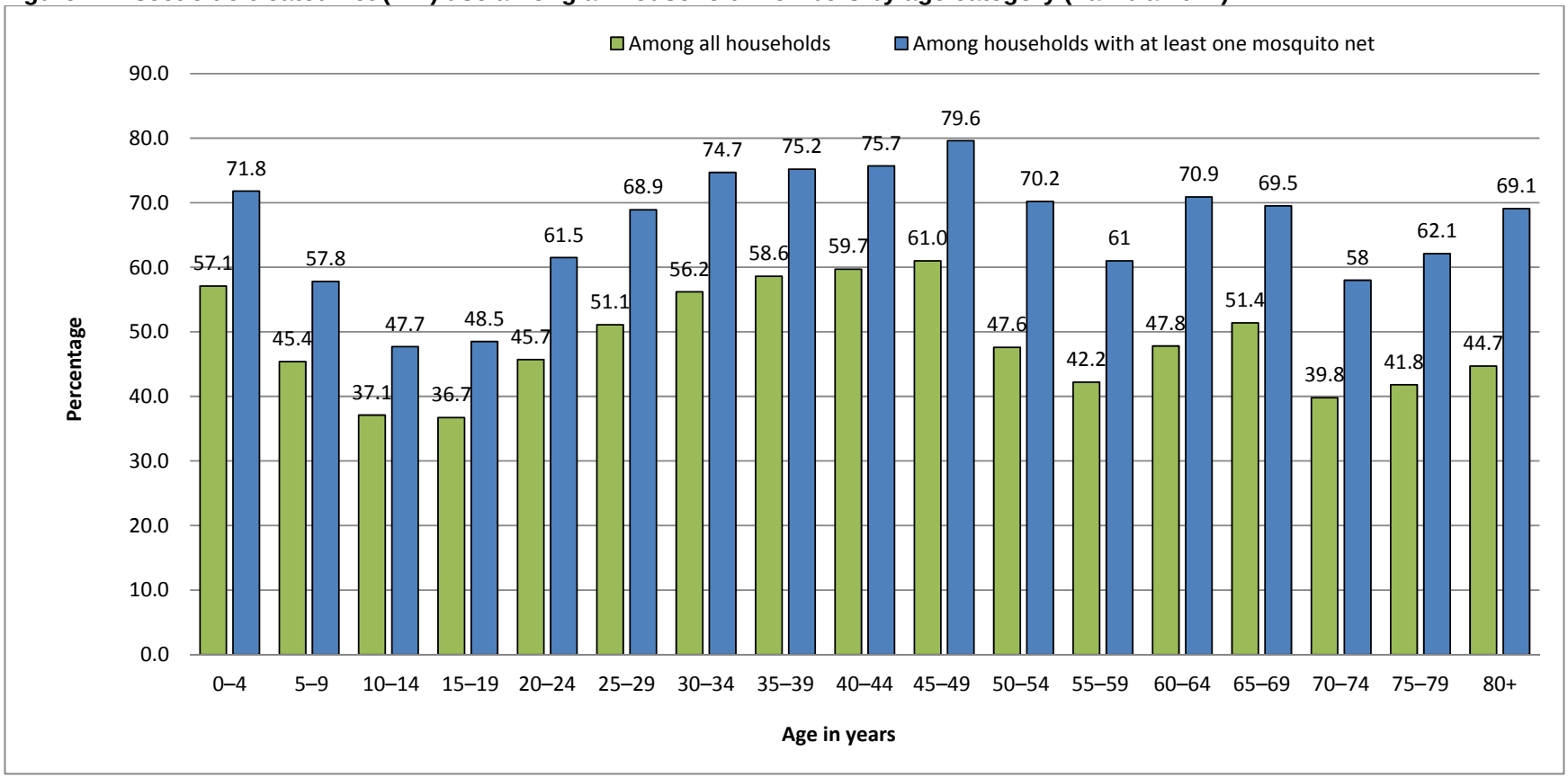
Background characteristic	Percentage of all household members who slept under a net last night	Percentage of all household members who slept under an ever-treated net last night	Percentage of all household members who slept under an ITN[1] last night	Number of all household members
	(1)	(2)	(3)	(4)
Sex				
Male	49.8	48.0	47.0	7,433
Female	54.2	51.9	50.5	8,749
Residence				
Urban	47.2	44.6	42.5	3,277
Rural	55.6	53.9	53.3	12,905
Province				
Central	40.0	36.7	36.7	1,637
Copperbelt	49.6	49.2	44.8	1,565
Eastern	71.5	71.0	70.9	2,449
Luapula	78.7	76.1	76.0	1,831
Lusaka	37.4	35.4	35.2	1,712
Muchinga	55.4	44.5	44.2	1,095
Northern	62.5	61.9	61.9	720
North-Western	54.9	54.4	54.4	943
Southern	39.1	38.0	36.3	2,126
Western	44.9	41.0	38.0	968
Wealth index				
Lowest	60.0	58.7	58.1	3,021
Second	56.7	55.1	54.1	3,066
Middle	51.1	49.1	48.2	3,271
Fourth	51.4	49.2	47.9	3,341
Highest	48.4	45.9	44.4	3,483
Total	52.2	50.1	48.9	16,182

[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 4 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 5 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 5 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 households with at least one mosquito net was 68.2%.

Figure 4. Insecticide-treated net (ITN) use among all household members by age category (Zambia 2012)



Indoor residual spraying

IRS is one of the primary malaria prevention strategies in Zambia and, as of 2011–2012, was carried out in parts of all districts throughout the country. **Table 11** presents the results for IRS reported by all households included in the sample.

Table 11. 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 2012)

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	18.9	3,050	93.0	5.0	4.8	506
Urban	33.8	750	91.1	2.0	4.4	253
Province						
Central	25.2	416	80.0	16.9	4.5	74
Copperbelt	48.8	358	84.4	5.5	4.4	162
Eastern	34.6	571	99.5	0.0	4.9	195
Luapula	16.3	410	99.4	0.0	5.3	44
Lusaka	11.9	416	87.5	2.5	4.1	49
Muchinga	30.1	254	95.1	0.0	4.7	48
Northern	10.0	415	100	0.0	5.1	37
North-Western	21.2	212	100	0.0	5.2	35
Southern	21.6	506	100	0.0	3.9	88
Western	12.2	242	100	0.0	4.5	27
Wealth index						
Lowest	16.5	759	97.4	2.6	5.0	110
Second	19.6	763	96.8	2.6	4.6	131
Middle	22.1	758	98.0	2.0	4.5	128
Fourth	27.2	758	95.9	2.4	4.7	172
Highest	30.8	762	85.7	4.6	4.4	218
Total	25.0	3,800	91.9	3.3	4.6	759

The results as seen in **Table 11** indicate that 33.8% of households in urban areas were sprayed in the previous 12 months, while 18.9% of rural households in these target districts had been sprayed. Households in Copperbelt, Eastern, and Muchinga provinces reported the highest percentage of households sprayed within the previous 12 months. More than 90% of this spraying was conducted by the government IRS programme. Central province reported the highest percentage of private agents conducting IRS activities (16.9%).

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 and peri-uban areas of districts. Poorer households are more likely to get their IRS through the government programmes than richer households.

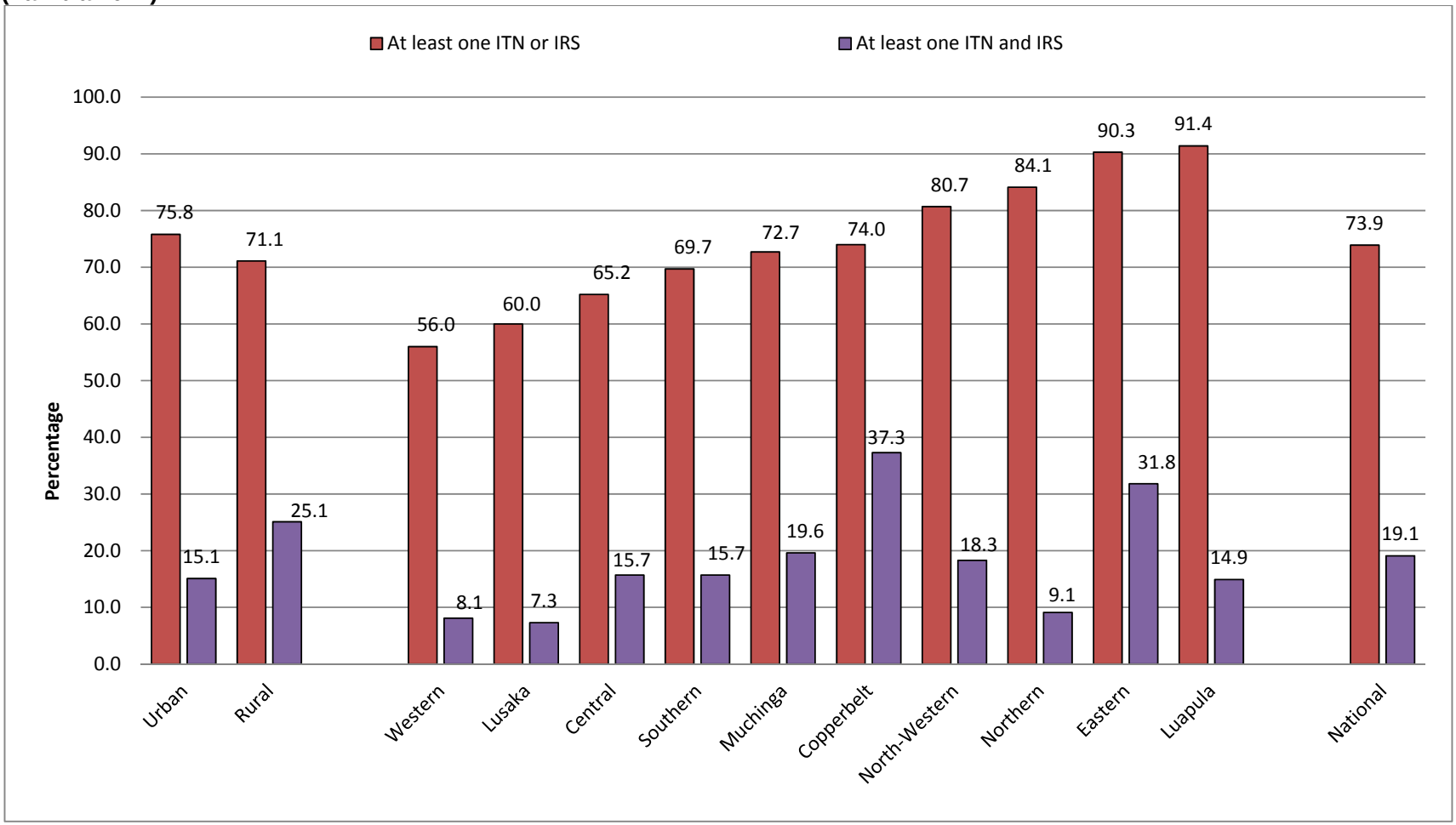
Among households sprayed within the previous 12 months, IRS activities were on average conducted within the past 4.6 months. Since the survey was conducted during April/May 2012, most houses were reportedly sprayed toward the end of 2011 and early 2012. Ideally IRS operations are completed in time for the onset of the rainy season and the subsequent malaria transmission season.

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 5** presents the percentage of households that reported having at least one ITN or/and IRS.

Nearly three-quarters (73.9%) of households reported having at least one ITN or reported having been sprayed within the previous 12 months before the survey. Luapula, Eastern, and Northern provinces reported the highest levels of coverage of either mosquito nets or IRS, largely driven by their high ITN coverage.

Nineteen percent of households reported ‘double coverage’—that is, having at least one ITN in their house and having their house sprayed. The provinces with the highest levels of double coverage were Copperbelt and Eastern.

Figure 5. Percentage of households with at least one insecticide-treated net (ITN) and/or indoor residual spraying (IRS) (Zambia 2012)



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. Recent policy recommendations from the World Health Organization point to benefits of more than two doses of IPT for prevention of malaria during pregnancy, including at each antenatal visit from the second trimester of gestation (WHO 2012). In Zambia, sulfadoxine-pyrimethamine (SP), also known as Fansidar, is currently the drug used for IPT.

Table 12 presents the results for the use of IPT by pregnant women during the last birth in the five years preceding the survey. Most mothers (87.7%) reported taking an antimalarial drug for prevention during their last pregnancy, and 84.1% of mothers received the antimalarial drug during a routine ANC visit. Among pregnant women, 72.4% took the recommended two or more doses of IPT. The vast majority of women received the two or more doses of IPT during the pregnancy where at least one of the doses was received during an ANC visit. Over half of women (52.4%) reported taking three or more doses of IPT during the last pregnancy at least of which was 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 (93.0% and 84.6%, respectively). Urban women also were more likely than their rural counterparts to receive IPT during an ANC visit (88.8% vs. 81.3%), and to have taken at least two doses during an ANC visit than rural women (74.6% and 67.0%, respectively).

Regional variations were also observed. Women in Copperbelt (85.3%) and Eastern (85.4%) provinces were more likely to have taken two doses of IPT during an ANC visit than those in other provinces. Women in Southern, Muchinga and Western provinces reported the lowest levels of two-dose IPT use during pregnancy during an ANC visit (47.4%, 53.5% and 55.9%, respectively).

Women with more education were more likely to take more of the recommended doses of IPT.

Table 12. 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 care (ANC) visit, by background characteristics (Zambia 2012)

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 took 3+ 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	Percentage of mothers who received 3+ doses of IPT, at least one of which was during an ANC visit	Number of mothers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residence								
Urban	93.0	93.0	77.8	63.7	88.8	74.6	61.0	323
Rural	84.6	84.6	69.4	48.8	81.3	67.0	47.4	1,674
Province								
Central	88.7	88.7	74.3	51.3	88.7	74.3	51.3	189
Copperbelt	94.9	94.9	85.3	72.6	94.9	85.3	72.6	127
Eastern	94.9	94.9	85.4	68.1	94.9	85.4	68.1	338
Luapula	89.7	89.7	76.6	57.5	89.7	76.6	57.5	242
Lusaka	94.0	94.0	75.1	60.1	84.8	67.9	54.3	177
Muchinga	72.0	72.0	53.5	32.2	72.0	53.5	32.2	138
Northern	89.7	89.7	74.4	53.5	89.7	74.4	53.5	278
North-Western	79.8	79.8	62.1	39.6	79.8	62.1	39.6	140
Southern	80.1	80.1	56.9	36.5	67.1	47.4	29.7	247
Western	70.6	70.6	61.4	46.2	61.5	55.9	45.2	121
Wealth index								
Lowest	84.0	84.0	72.5	51.4	83.0	71.5	51.4	429

continued

Table 12. 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 care (ANC) visit, by background characteristics (Zambia 2012)

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 took 3+ 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	Percentage of mothers who received 3+ doses of IPT, at least one of which was during an ANC visit	Number of mothers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Second	82.1	82.1	68.0	46.6	79.7	66.8	45.6	431
Middle	82.8	82.8	62.6	43.9	80.7	61.4	43.5	412
Fourth	89.5	89.5	75.3	57.2	83.9	70.5	54.1	376
Highest	93.6	93.6	78.0	62.9	88.5	74.2	59.6	349
Education								
None	82.3	82.3	67.7	46.9	80.7	66.0	46.4	346
Primary	87.0	87.0	70.2	51.0	83.3	67.6	49.4	1155
Secondary	91.3	91.3	77.0	61.0	86.8	73.7	58.2	452
Higher	88.9	88.9	87.0	73.6	86.2	84.3	70.9	44
Total	87.7	87.7	72.4	54.2	84.1	69.8	52.4	1,997

[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 ART-LUM as first-line therapy for uncomplicated malaria in children over 5 kg, and SP for uncomplicated malaria in children under 5 kg (MOH 2010). Quinine is designated as the recommended drug for complicated malaria.

According to the current malaria control strategy, Zambia aims to treat 85% of patients within 24 hours of symptom onset by the end of the current NMSP (2006–2012). Prompt presentation of febrile children to health facilities is essential to meeting this target.

Table 13 presents results for prevalence of fever among children under age five years and treatment-seeking behaviour for these children. Almost one-quarter (24.2%) of children had a fever in the last two weeks. Of these, 36.9% took an antimalarial drug, and 20.4% took the drug within 24 hours of symptom onset. Only 24.5% sought treatment from a health facility/provider within that time period. The highest prevalence of fever was seen in children ages 24 to 35 months (28.1%), followed by those ages 36 to 47 months (27.2%).

Among children with fever, 32.3% reported having a heel or finger stick when they sought treatment during their fever episode. This indicator is a proxy measure for testing rates among those seeing care. This rate of reporting finger sticks or heel sticks is nearly double the rate in 2010 (16.7%). Copperbelt and North-Western 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 (29.3% and 13.2%, respectively). However, children in rural areas were as likely to take an antimalarial drug for the febrile episode as were their urban counterparts (37.0% and 36.5%, respectively), and were as likely as urban children to take an antimalarial drug within 24 hours (19.9% and 20.8%, respectively).

In the lowest wealth quintile, 35.1% of children suffered from fever in the last two weeks, and 33.9% of those took an antimalarial drug. Nearly sixteen percent (15.8%) were treated promptly within 24 hours and almost one-quarter (22.0%) were seen by a health provider/facility in that time period. These figures are nearly identical to what was reported in the 2010 MIS for this lowest quintile.

Table 13. 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 2012)

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	19.0	561	29.0	37.2	22.1	28.2	115
12–23	24.0	549	27.2	32.2	16.0	22.1	143
24–35	28.1	503	42.5	41.5	24.1	24.4	138
36–47	27.2	539	31.7	36.3	20.6	24.2	170
48–59	22.6	468	29.8	37.6	18.8	24.2	121
Sex							
Male	24.8	1,296	31.1	35.7	20.8	27.2	338
Female	23.5	1,324	32.8	38.1	19.9	21.7	349
Residence							
Urban	13.2	352	31.1	36.5	22.8	25.2	44
Rural	29.3	1,575	32.6	37.0	19.8	24.3	643
Province							
Central	22.3	245	34.6	35.9	24.5	23.7	61
Copperbelt	17.7	148	56.6	64.4	24.1	29.4	28
Eastern	19.5	477	43.7	47.2	13.9	27.9	94

continued

Table 13. 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 2012)

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)
Luapula	39.7	365	28.5	50.8	32.6	23.3	139
Lusaka	17.7	209	14.4	6.6	5.1	20.3	39
Muchinga	17.2	200	27.7	37.2	25.1	34.9	38
Northern	37.3	404	26.4	34.2	18.1	22.3	131
North-Western	23.5	121	54.2	47.4	30.9	28.9	30
Southern	20.6	293	30.8	22.0	17.4	16.8	71
Western	33.5	158	19.9	19.8	17.6	27.3	56
Wealth index							
Lowest	35.1	601	28.9	33.9	15.8	22.0	198
Second	28.4	617	37.7	42.7	22.9	30.1	177
Middle	27.7	545	31.6	31.8	22.9	26.0	140
Fourth	20.0	468	27.1	38.3	24.2	18.0	111
Highest	15.1	389	35.1	37.9	17.9	24.2	61
Total	24.2	2,620	32.3	36.9	20.4	24.5	687

Table 14 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: 31.6% of children with fever in the last two weeks were treated with Coartem®, 3.1% with SP, and 2.0% with quinine (for severe malaria according to the treatment guidelines). Among children treated within 24 hours of onset of fever, 17.4% were given Coartem®, 1.4% SP and 1.4% quinine.

Children in urban areas were slightly less likely to report taking Coartem® than those in rural areas (29.9% urban vs. 32.0% rural), but were slightly more likely to receive Coartem® the same day or the next day than in rural areas (18.5% urban use within 24 hours vs. 17.1% rural use within 24 hours). Lusaka province reported the lowest use of Coartem®. The National Malaria Control Program and partners have invested heavily in reducing Coartem® consumption in Lusaka through a program of improving quality assurance for diagnostic testing services. Program reports suggest this has dramatically reduced diagnosis of malaria, especially for malaria parasitologically-confirmed test negatives and the resulting prescription of Coartem®.

Table 14. 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 2012)

	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	31.6	3.3	1.9	0.4	19.9	1.3	0.9	0.0	115
12–23	27.4	3.6	1.2	0.0	13.4	1.4	1.2	0.0	143
24–35	37.7	1.7	2.1	0.0	20.9	1.1	2.1	0.0	138
36–47	30.7	2.5	2.7	0.4	17.1	1.0	2.1	0.4	170
48–59	30.2	4.9	1.8	0.8	15.7	2.3	0.0	0.8	121
Residence									
Urban	29.9	4.3	2.2	0.0	18.5	2.1	2.2	0.0	44

continued

Table 14. 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 2012)

	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)
Rural	32.0	2.8	1.9	0.4	17.1	1.2	1.2	0.3	643
Province									
Central	23.9	12.0	0.0	0.0	14.8	9.7	0.0	0.0	61
Copperbelt	59.7	4.7	0.0	0.0	24.1	0.0	0.0	0.0	28
Eastern	37.6	5.0	4.6	0.0	12.9	0.0	1.0	0.0	94
Luapula	48.9	0.0	1.5	0.4	31.1	0.0	1.5	0.0	139
Lusaka	3.6	1.5	1.5	0.0	3.6	0.0	1.5	0.0	39
Muchinga	34.9	2.2	0.0	0.0	22.8	2.2	0.0	0.0	38
Northern	31.9	1.0	0.6	0.6	16.1	0.7	0.6	0.6	131
North-Western	37.2	5.1	5.1	0.0	23.3	5.1	2.5	0.0	30
Southern	13.7	3.4	3.7	1.2	10.1	2.3	3.7	0.1	71
Western	14.4	2.3	3.1	0.0	14.4	0.0	3.2	0.0	56
Total	31.6	3.1	2.0	0.3	17.4	1.4	1.4	0.2	687

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

Table 15 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 (73.9%) were obtained from a government health facility. The percentage of Coartem® received from community health workers (CHWs) increased from 2.1% in 2010 to 8.5% in 2012, reflecting the investments the MOH and partners have made in training CHWs to provide testing and treatment services for malaria in some parts of the country. Respondents also reported using medications already present in the home (3.2%) or purchased at a shop (8.5%). Three-quarters (75.4%) of Coartem® treatments were obtained through a government health facility. The source of antimalarial drugs apart from Coartem® was more difficult to determine reliably in 2012 due to the lower reported prevalence of fevers among children and the correspondingly lower numbers of treatments that were reported for those febrile children.

Table 15. 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 2012)

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®	2.6	8.5	75.4	5.3	7.0	1.3	100.0	213
SP/Fansidar	*	*	*	*	*	*	100.0	21
Quinine	*	*	*	*		*	100.0	14
Other antimalarial	*	*	*	*	*	*	100.0	2
All antimalarial drugs	3.2	8.1	73.9	5.3	8.5	1.1	100.0	250

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 16 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 g/dl.

Overall, malaria parasite prevalence was 14.9% with more parasitaemia among children in rural areas (20.2%) compared to urban areas (3.7%). On average, parasitaemia prevalence peaked among children aged four years and was highest in Luapula province (32.1%) and in the lowest wealth quintile (27.4%).

More than half (55.0%) of children were found to have anaemia, with younger children reporting the highest levels of anaemia. Eastern and Luapula provinces reported the highest levels of anaemia, at 66.2% and 63.2%, respectively. Severe anaemia was found to be the highest in Luapula and Western provinces at 12.0% and 10.8%, respectively.

Nationally, severe anaemia prevalence was 6.8%; it was higher in rural areas than urban areas (8.2% and 3.8%, respectively) and there was little difference in severe anaemia rates between males and females (6.7% and 7.0%). 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 et al. 2009). For this reason, the Zambia survey showed some discordant results with regard to parasite prevalence between microscopy (14.9%) and RDT (29.5%) 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 2012 and for comparison with previous malaria indicator surveys conducted in Zambia in 2006–2010.

Table 16. 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 2012)

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	9.8 (15.9)	10.3	0.08	70.0	7.2	523
12–23	11.7 (24.4)	10.2	0.09	66.7	9.9	595
24–35	16.3 (31.7)	10.7	0.09	53.8	6.9	620
36–47	16.2 (35.0)	10.9	0.09	45.2	6.0	672
48–59	19.6 (38.0)	11.1	0.09	42.4	3.9	596
Sex						
Male	14.7 (29.1)	10.6	0.06	56.8	6.7	1,510
Female	15.1 (30.0)	10.7	0.07	53.1	7.0	1,496
Residence						
Urban	3.7 (8.2)	11.0	0.11	46.2	3.8	409
Rural	20.2 (39.7)	10.5	0.06	59.2	8.2	2,597
Province						
Central	8.5 (12.8)	10.8	0.15	55.8	4.4	259
Copperbelt	4.7 (17.4)	11.0	0.19	46.6	3.5	225
Eastern	25.3 (51.1)	10.2	0.13	66.2	9.9	492

continued

Table 16. 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 2012)

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)
Luapula	32.1 (56.0)	10.2	0.15	63.2	12.0	356
Lusaka	0.0 (4.8)	10.9	0.14	47.5	4.4	196
Muchinga	19.4 (33.5)	10.9	0.34	50.2	8.3	219
Northern	23.7 (47.3)	10.5	0.16	59.0	9.3	450
North-Western	16.9 (32.5)	10.9	0.12	45.5	3.4	237
Southern	8.4 (10.0)	10.7	0.14	55.9	4.0	370
Western	12.6 (34.3)	10.4	0.17	58.2	10.8	202
Wealth index						
Lowest	27.4 (49.5)	10.1	0.11	66.0	11.0	658
Second	21.1 (42.8)	10.4	0.10	57.6	9.3	689
Middle	17.9 (35.1)	10.6	0.09	57.7	5.9	660
Fourth	13.9 (27.7)	10.7	0.09	50.6	6.6	585
Highest	1.8 (5.8)	11.0	0.11	47.8	3.1	414
Total	14.9 (29.5)	10.6	0.06	55.0	6.8	3006

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 and knowledge 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 NMCP and partner efforts to promote household-level utilization and penetration of malaria interventions.

Table 17 presents data on respondents' awareness of malaria, its primary symptom (fever), its route of transmission, and measures of prevention and control such as nets and IRS. Among 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 (95.8%) had heard of malaria, with little variation across most regions, urban and rural areas, wealth index, or education level. Western and Southern provinces reported lower levels of exposure to the idea of malaria than other areas of the country. This may be partly explained by their generally lower levels of malaria than in other areas of the country.

Overall, 77.5% of women recognized fever as a symptom of malaria. Women in rural areas were almost as likely to report this knowledge as those in urban areas (76.9% and 78.3%, respectively). There were marginal differences in this knowledge by province and increasing wealth quintile. Western province again had the lowest reported level of this knowledge.

Recognition of mosquitoes as the vector for malaria transmission is essential for consistent and successful use of prevention tools. Across Zambia, 89.4% of women reported that mosquito bites cause malaria. Women in urban areas were more likely to recognize this than those in rural areas (94.7% and 84.6%, 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 80.1% of women with no education recognizing the transmission source and all surveyed women with a higher education recognizing it. Regional differences were also observed; Western province reported the lowest levels of this knowledge.

Specific knowledge of prevention methods is also key to effective control. Overall, 86.2% of women reported that use of mosquito nets could prevent malaria. Urban women were more likely to note this than rural women (91.4% urban vs. 81.4% rural).

Table 17. 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 2012)

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	97.6	78.3	94.7	91.4	651
Rural	94.2	76.9	84.6	81.4	2,048
Province					
Central	93.7	78.5	85.6	77.4	207
Copperbelt	99.1	83.6	95.6	93.6	284
Eastern	95.2	76.3	85.4	83.5	490
Luapula	97.9	89.7	92.5	91.4	326
Lusaka	98.2	72.1	94.2	88.2	330
Muchinga	95.2	77.5	89.2	83.0	161
Northern	98.1	74.1	86.0	84.2	327
North-Western	93.7	78.8	81.0	79.6	153
Southern	89.7	75.0	85.7	83.0	272
Western	78.1	62.2	71.2	71.6	128
Wealth index					
Lowest	94.2	76.4	80.1	78.3	498
Second	90.8	69.5	79.3	76.9	484
Middle	93.4	78.3	86.2	82.5	486
Fourth	96.6	80.1	92.7	87.3	539
Highest	98.2	79.1	94.6	91.7	692
Education					
None	91.2	71.3	80.3	76.6	378
Primary	95.0	74.6	85.5	82.6	1407
Secondary	97.5	80.3	94.9	91.4	822
Higher	100.0	94.0	100.0	96.9	92
Total	95.8	77.5	89.4	86.2	2,699

Figure 6 presents the responses most often reported as methods of prevention of malaria. More women ages 15 to 49 years (61.8%) reported use of a mosquito net for malaria prevention, followed by use of a treated mosquito net (35.7%). Having your house sprayed and cleaning the area surrounding the home were next most often reported malaria prevention methods.

Figure 6. Among women ages 15 to 49 years, knowledge of malaria prevention methods (Zambia 2012)

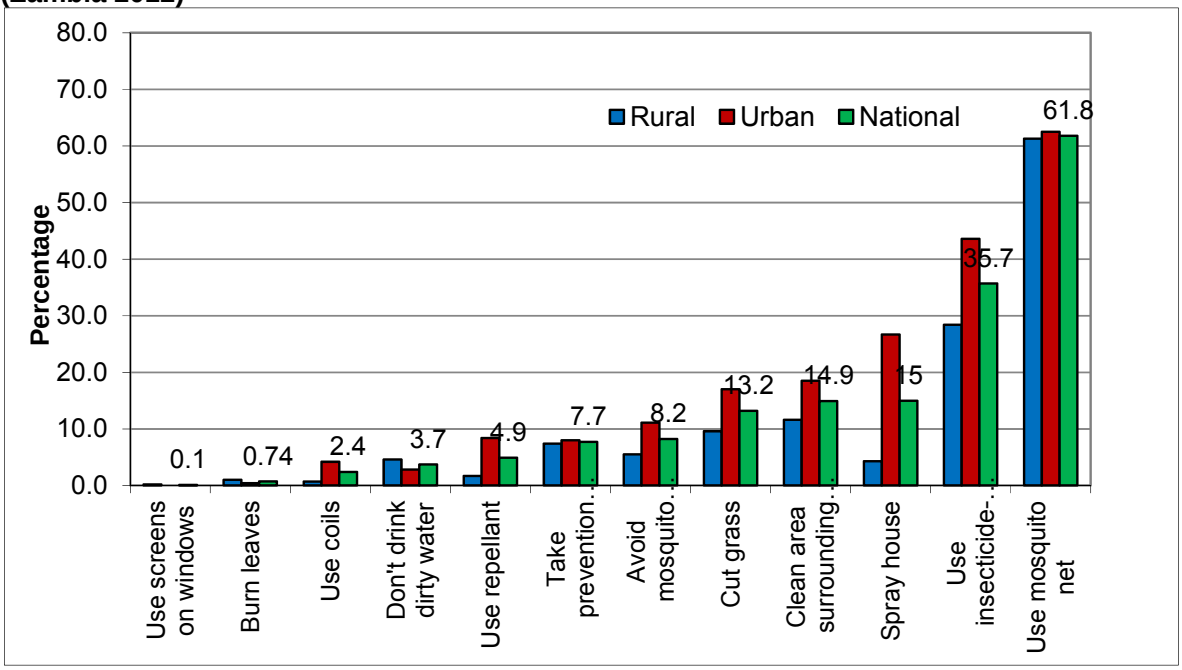


Table 18 presents information on exposure to malaria messages among women ages 15 to 49 years. Among women who reported having seen or heard messages, the average number of months prior to the survey that the messages were seen or heard was 3.2 months. Two-thirds (67.2%) of women reported government hospitals or clinics as the source of the messages. When asked about the content of the messages seen or heard, 41.8% reported seeing or hearing messages about the importance of sleeping under mosquito nets.

Table 18. Malaria messaging through information, education and communication strategies
Among eligible women ages 15 to 49 years who reported hearing a malaria message, 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, by background characteristics (Zambia 2012).

Background characteristic	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)
Residence				
Urban	3.0	62.6	46.9	634
Rural	3.3	71.7	37.1	1,912
Province				
Central	3.5	61.2	20.4	194
Copperbelt	2.8	80.7	57.3	302
Eastern	3.0	81.1	46.6	466
Luapula	3.1	84.3	51.4	317
Lusaka	2.9	54.9	38.8	321
Muchinga	4.6	63.0	14.3	154
Northern	2.9	66.0	39.1	318
North-Western	3.4	69.1	19.5	144
Southern	3.5	52.2	42.6	235
Western	3.2	81.1	40.8	94
Wealth index				
Lowest	3.4	78.3	39.3	463
Second	3.5	73.6	33.6	436
Middle	3.8	68.8	36.0	453
Fourth	3.1	73.0	39.0	516
Highest	2.8	60.2	47.4	676
Education				
None	3.6	75.1	30.2	361
Primary	3.3	71.5	39.8	1,325
Secondary	3.1	61.4	43.5	791
Higher	1.6	61.1	68.7	92
Total	3.2	67.2	41.8	2,456

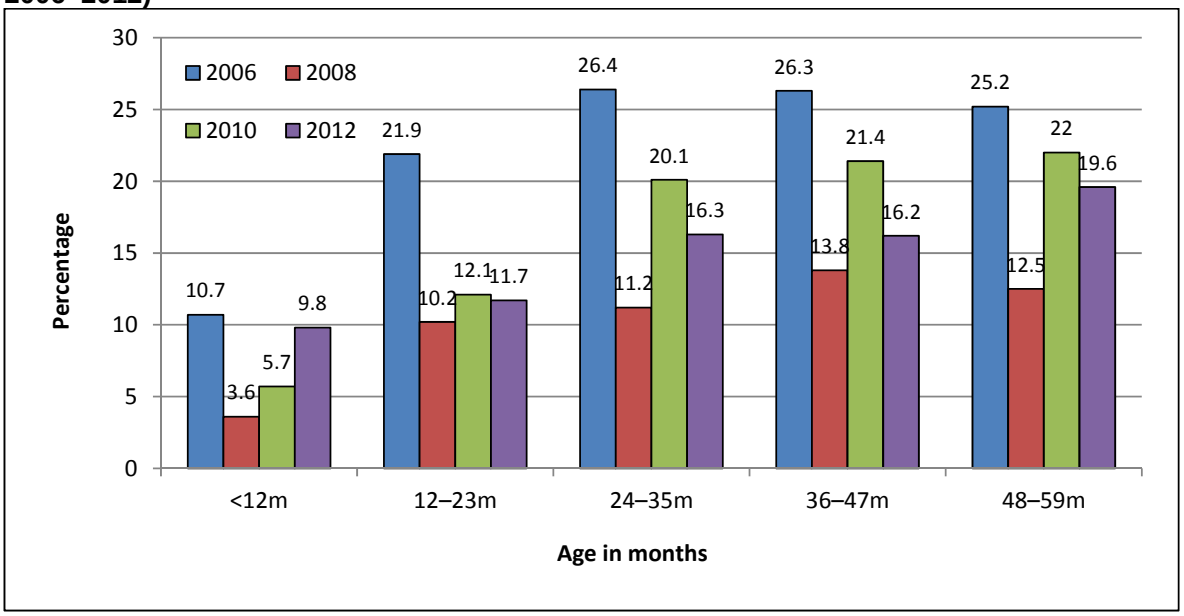
Chapter 6: Comparison of malaria indicator survey results, 2006–2012

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 surveys. In particular, the summary examines parasitaemia and anaemia rates, coverage and usage of ITNs, and IRS.

Malaria parasite and severe anaemia prevalence

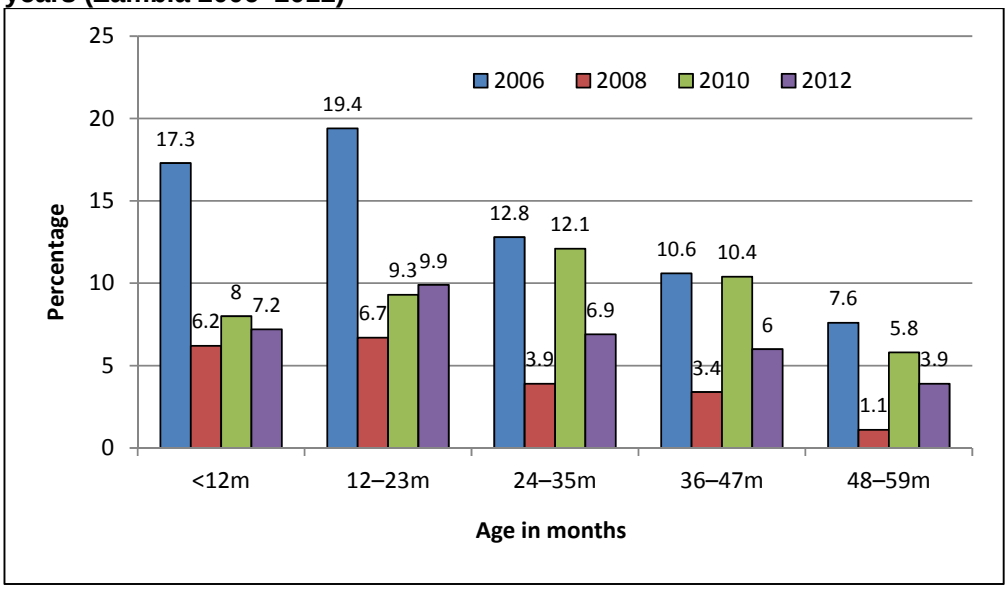
Malaria parasite prevalence, as measured by slide microscopy, and severe anaemia (Hb<8 g/dl) have changed quite dramatically across the surveys conducted in 2006, 2008, and 2012. Overall, malaria parasite prevalence by microscopy was found to be 21.8%, 10.2%, 16.0%, and 14.9% in 2006, 2008, 2010, and 2012 respectively while severe anaemia prevalence was found to be 13.8%, 4.3%, and 9.2% in 2006, 2008, and 2012, respectively. Malaria parasite rates typically increase with increasing age in the first five years of life. **Figure 7** 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 2012 seems to be greatest among children under age two.

Figure 7. Malaria parasite prevalence by age among children under age five years (Zambia 2006–2012)



Across all four surveys among children under age five, severe anaemia prevalence began to decline after age two (Figure 8). The increases in severe anaemia prevalence reported in 2010 were more substantial in older children than in younger children. By 2012, increases seen in 2010 had reduced in the older age groups.

Figure 8. Severe anaemia prevalence (Hb <8 g/dl) by age among children under age five years (Zambia 2006–2012)



By geographic residence, malaria parasite prevalence continues to be greatest in rural areas. **Figure 9** shows rural and urban prevalence since 2006. By 2012, urban areas reported slightly greater absolute decline in parasite prevalence by microscopy. From 2006 to 2012, the relative decline in microscopy prevalence nationally is 35%.

Figure 9. Malaria parasite prevalence among children under age five years by urban and rural areas (Zambia 2006–2012)

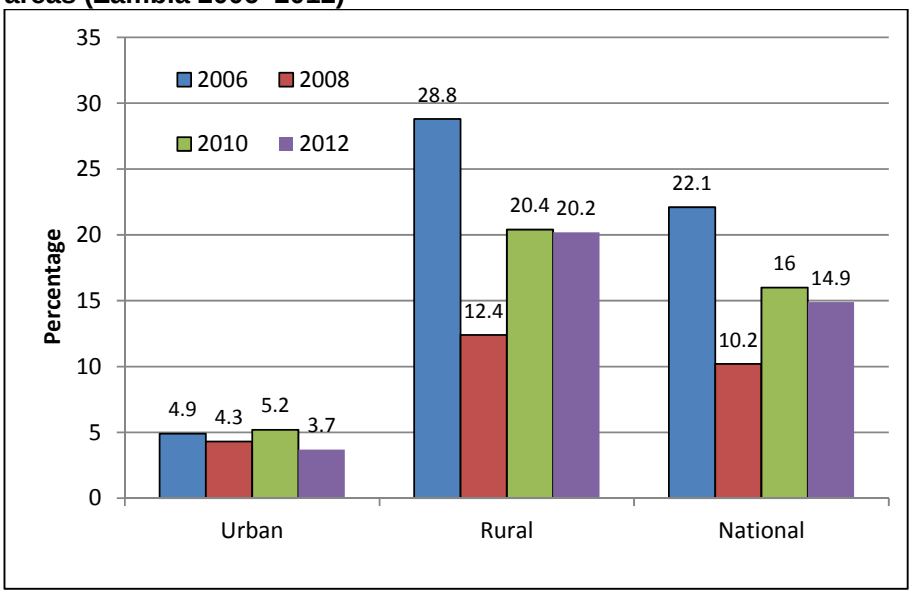


Figure 10 shows malaria parasite prevalence by microscopy patterns across the ten provinces in Zambia. Lusaka province initially had quite low levels of transmission and this stayed very low and stable over the last several years. Lusaka, Southern, Copperbelt, and Central provinces reported less than 10% parasitaemia in 2012. The largest relative decline in parasite prevalence by microscopy was observed in Copperbelt and Luapula provinces compared to 2010. Western and North-Western provinces had the largest relative increase in parasite prevalence compared to 2010.

Figure 10. Malaria parasite prevalence among children under age five years, by province (Zambia 2006–2012)

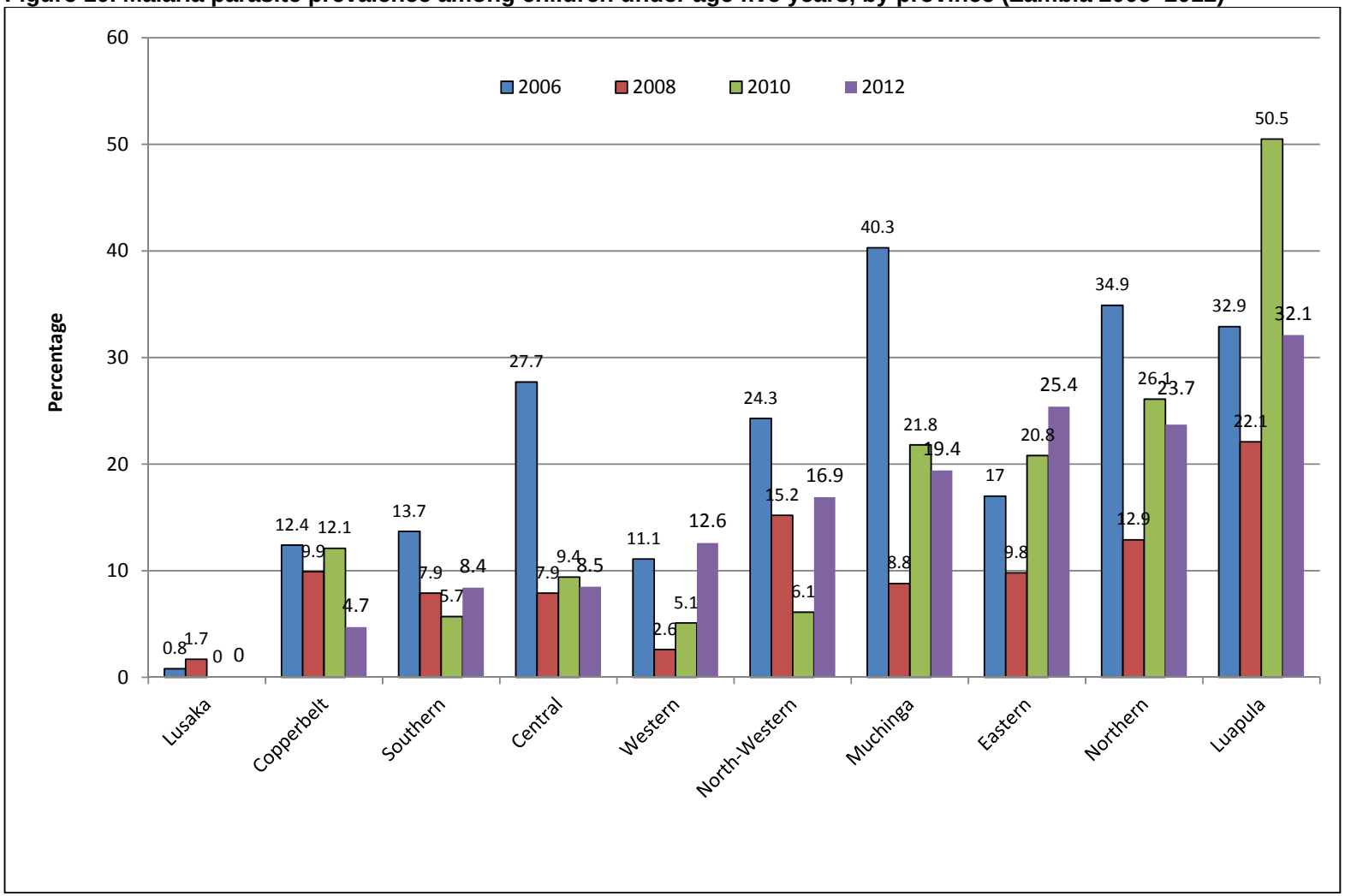
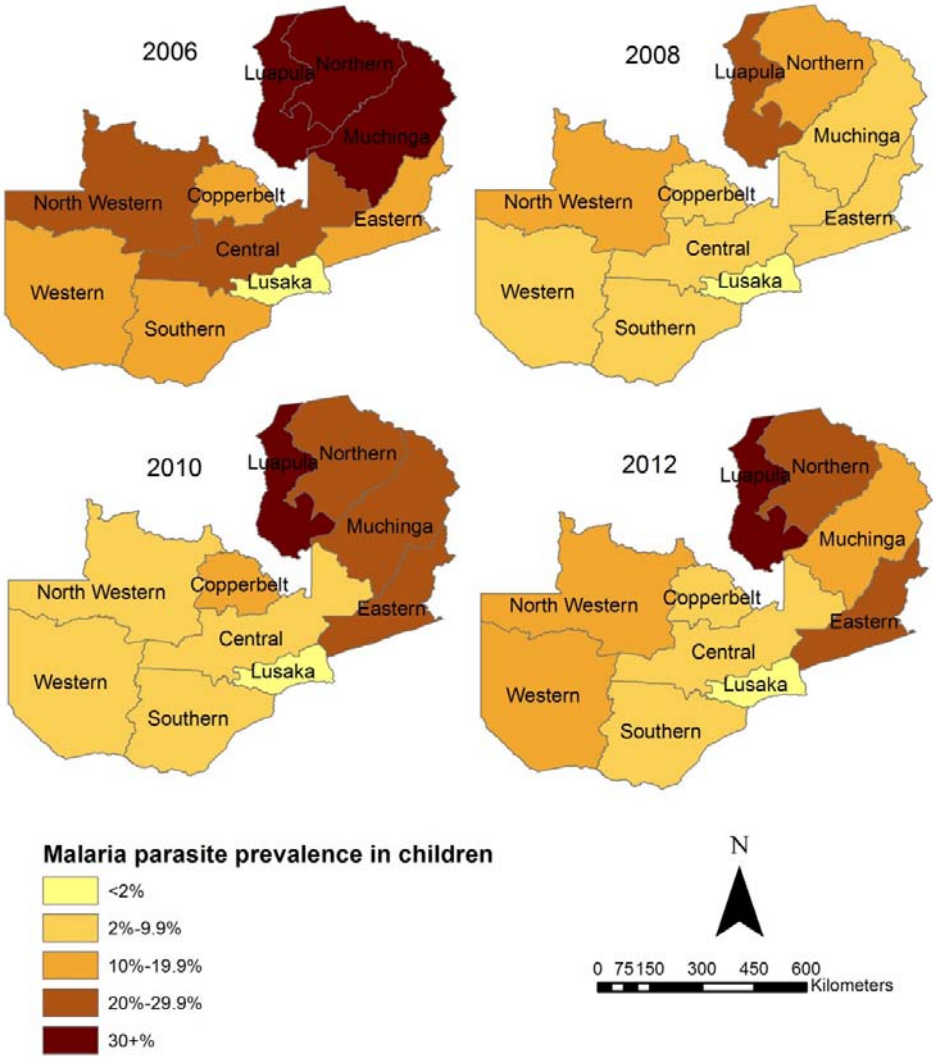


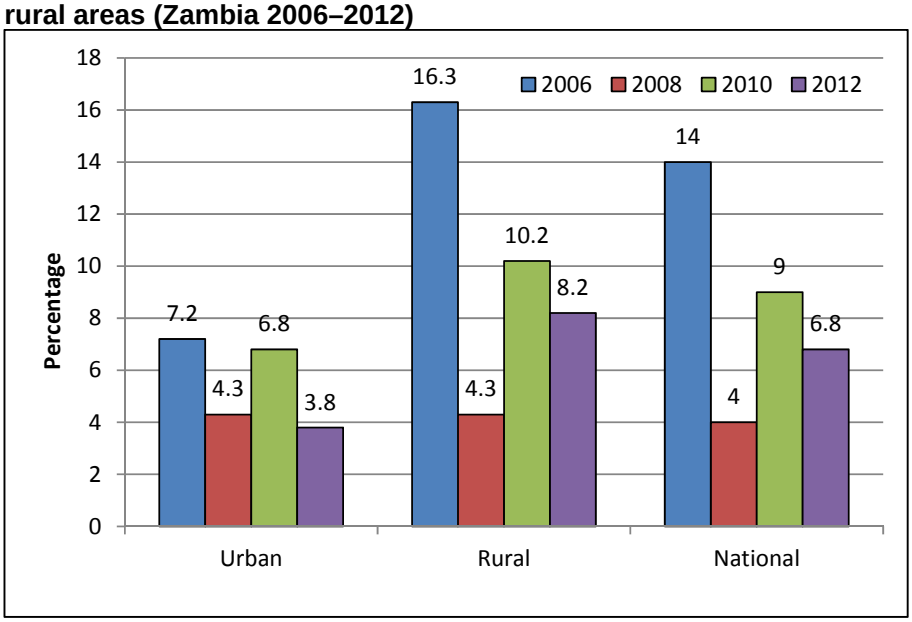
Figure 11 shows a spatial representation of malaria parasite prevalence from 2006 to 2012.

Figure 11. Percentage malaria parasite prevalence by province among children under age five years (Zambia 2006–2012)



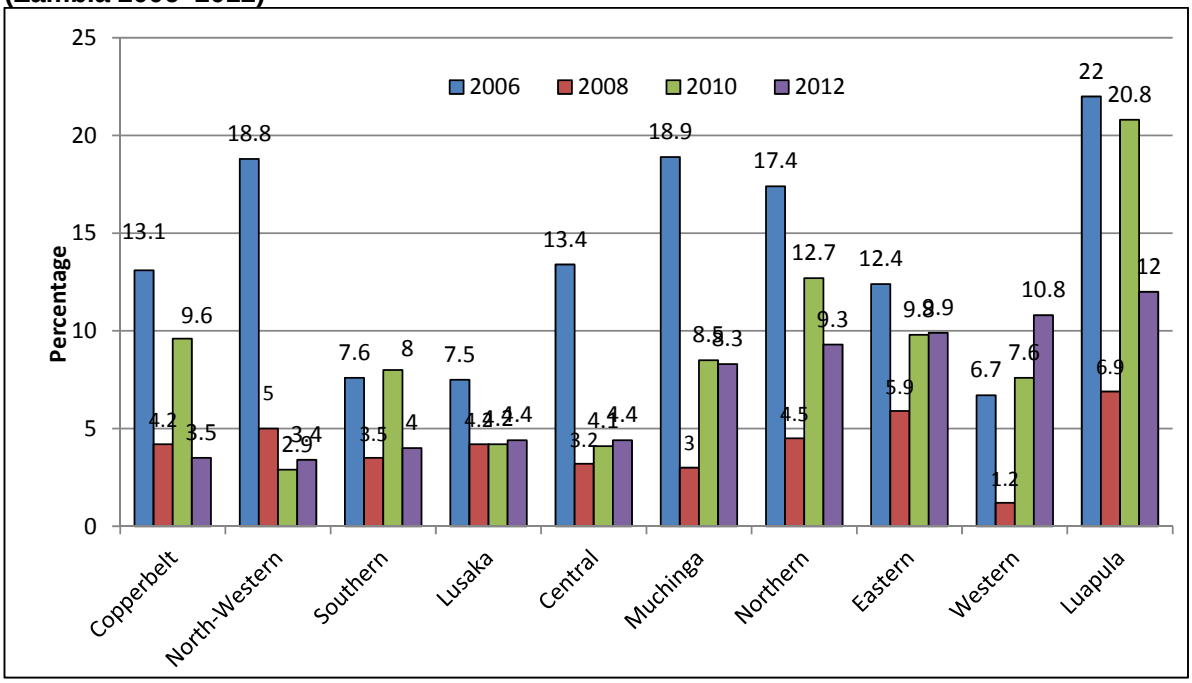
Severe anaemia prevalence has exhibited a geographic pattern similar to malaria parasite prevalence across the four surveys. Severe anaemia was much more prevalent in rural areas and, despite the apparent anomaly year in 2008, both urban and rural areas reported a consistent decline across the 2006 to 2010 to 2012 levels (**Figure 12**).

Figure 12. Severe anaemia prevalence among children under age five years by urban and rural areas (Zambia 2006–2012)



Among provinces, Copperbelt, Luapula, and Southern reported the largest declines in severe anaemia relative to 2010. Western province reported the only noteworthy increase in severe anaemia from 2010 while all other areas remained largely the same (**Figure 13**).

Figure 13. Severe anaemia prevalence among children under age five years by province (Zambia 2006–2012)



The trends in wealth quintile (**Figure 14**) demonstrate that poorer households showed declines from 2010 in malaria parasite prevalence relative to the less poor households. Less poor households showed an increase in parasite prevalence across the three highest levels of wealth status. Severe anaemia prevalence showed declines across all quintiles compared to 2010, with the largest declines in the poorest quintiles (**Figure 15**).

Figure 14. Malaria parasite prevalence among children under age five years by wealth quintile (Zambia 2006–2012)

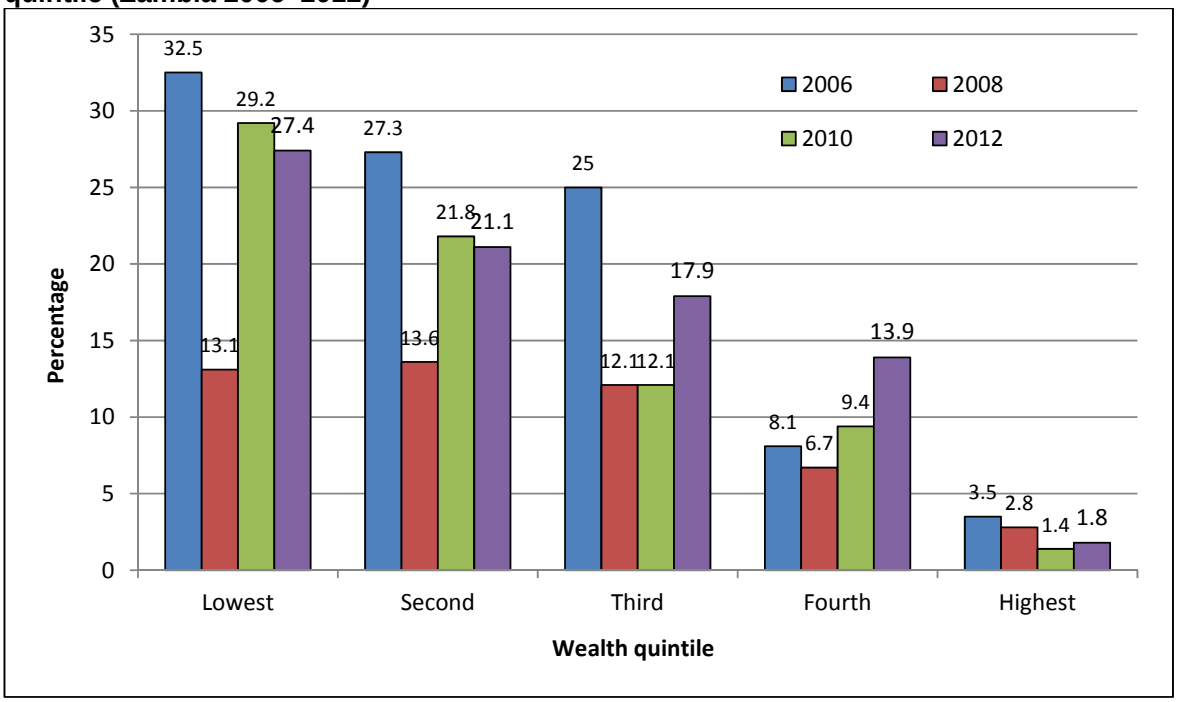
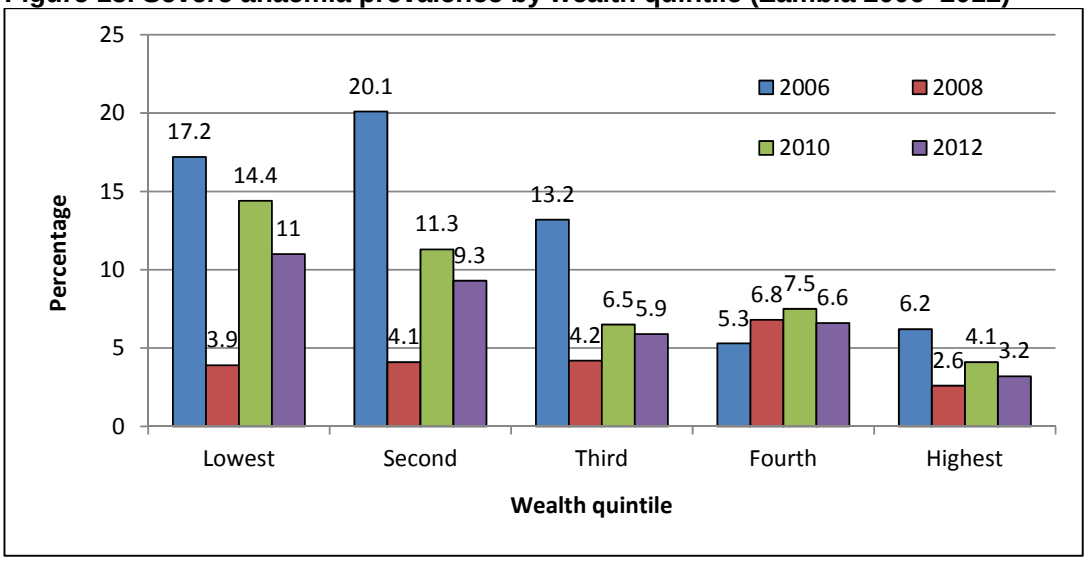


Figure 15. Severe anaemia prevalence by wealth quintile (Zambia 2006–2012)

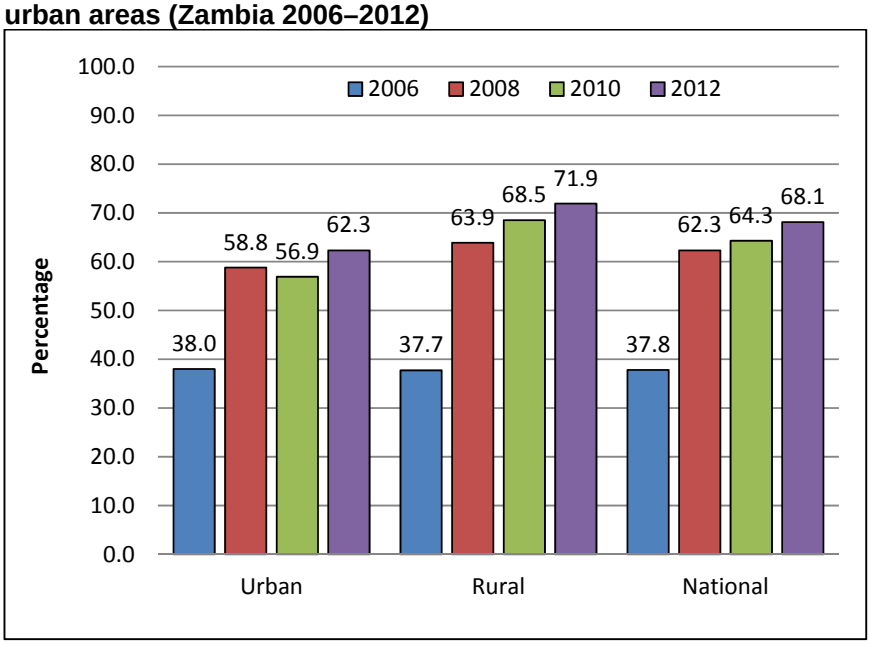


Insecticide-treated mosquito net ownership

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 rolling mass distributions every year (**Figure 16**). Large mass distributions were conducted in the rural areas of Eastern, Northern and Luapula provinces in response to the 2010 MIS results. These occurred during late 2010 and throughout 2011. In urban areas, a slight increase in coverage was observed between 2010 and 2012 despite ITNs being targeted toward more rural areas.

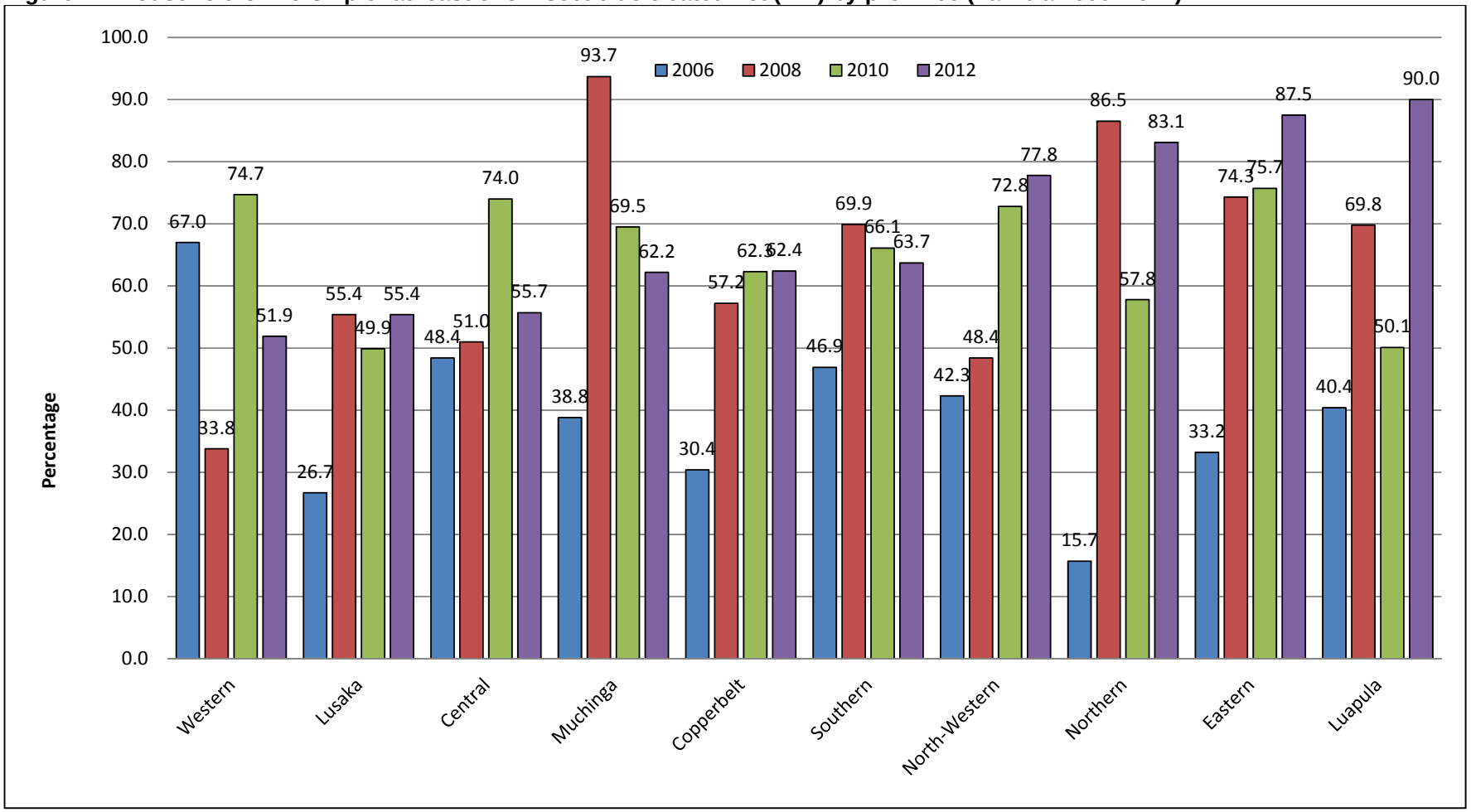
Figure 16. Household ownership of at least one insecticide-treated net (ITN) by rural and urban areas (Zambia 2006–2012)



ITN ownership has varied by province in Zambia (**Figure 17**). All but three provinces now have at least 60% coverage of households with at least one ITN. Central and Western provinces showed the most substantial decrease in ITN coverage since 2010. These two provinces were the last to receive the mass distribution prior to the 2010 survey and are the next due for replacement following the 2012 survey. Luapula and Northern provinces showed the greatest increase in ITN coverage. Eastern province was able to maintain coverage levels achieved in 2006–2012 period with a steady reasonable increase between 2010 and 2012.

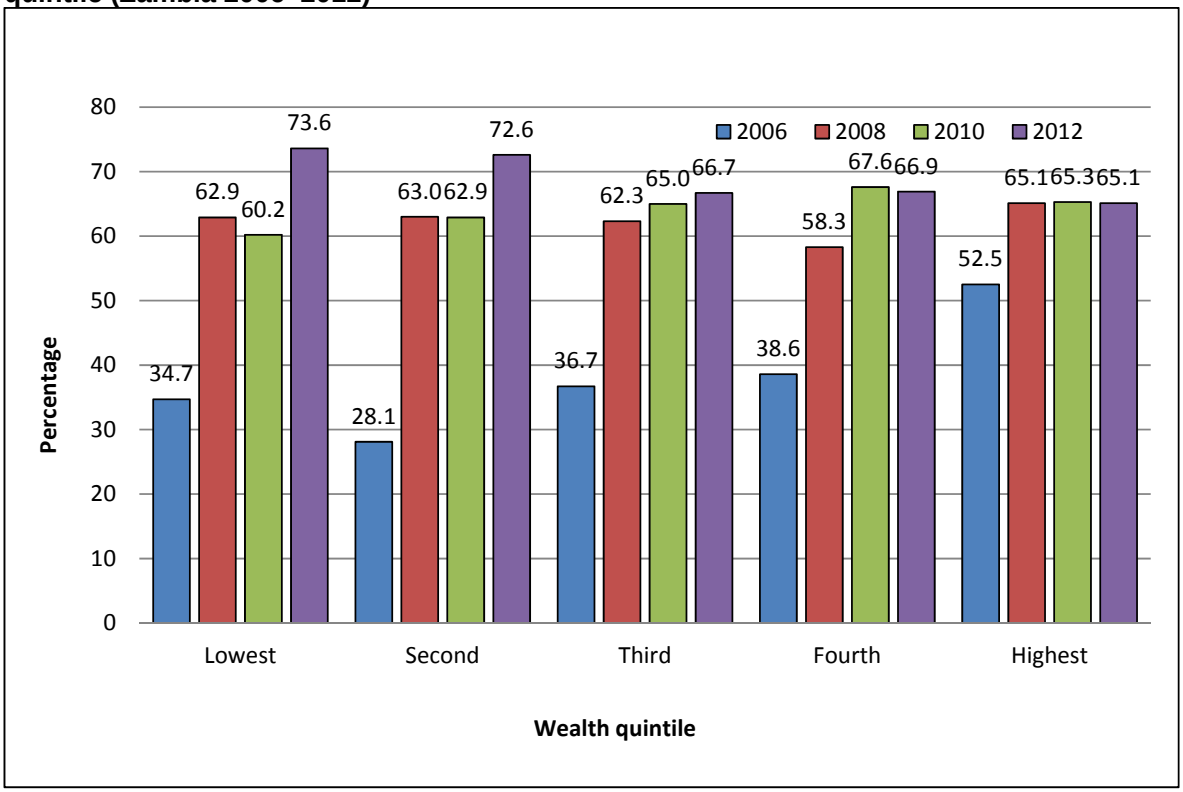
The scheduled system of rolling mass distributions for replacing ITNs is likely to continue to lead to a pattern of some areas being higher and then lower from one year to the next. The MIS results over time reflect this to a large degree. In 2012 after the MIS was conducted, areas of Western and Central were targeted for distribution. The current National Malaria Strategic Plan 2011–2015 calls for a more consolidated approach to mass ITN distribution to avoid gap years in provinces and to increase coverage in more provinces during a single calendar year with measurement of progress in the immediate transmission season following the distribution.

Figure 17. Household ownership of at least one insecticide-treated net (ITN) by province (Zambia 2006–2012)



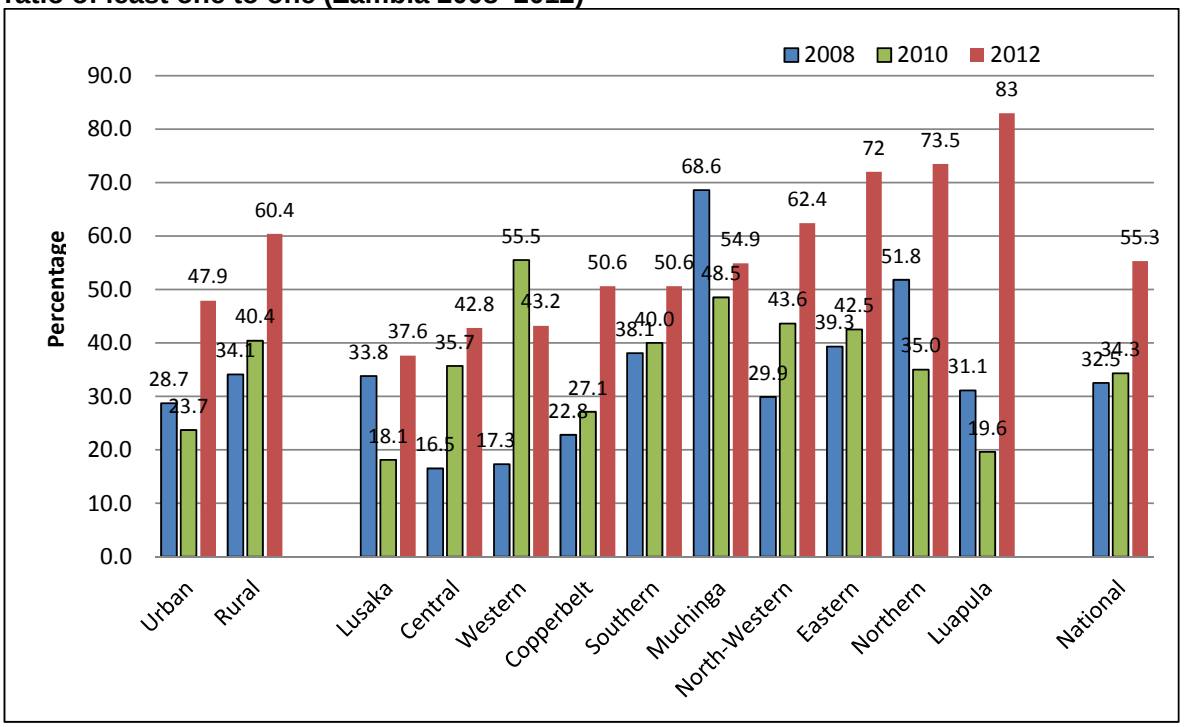
In terms of wealth quintiles, household ITN ownership has been relatively equitable between MIS 2008, 2010, and 2012 compared to results from MIS 2006 (**Figure 18**). The MIS 2012 revealed the largest increase in coverage among the poorest households relative to previous years.

Figure 18. Household ownership of at least one insecticide-treated net (ITN) by wealth quintile (Zambia 2006–2012)



In examining trends in full coverage availability of ITNs (a one-to-one ratio of ITNs to sleeping spaces), **Figure 19** shows tremendous progress across urban and rural areas as well as among the provinces, with significant improvement nationally. Among households that have ITNs, getting full coverage—sufficient ITNs to cover all the sleeping spaces—has been substantial. This is an indication that resources to distribute ITNs are being more efficiently used per household visited. Further, this creates the potential for increasing numbers of fully protected houses, an optimal approach toward malaria reduction. The only area showing a decline in this full coverage indicator was Western province, which was subsequently targeted for mass distribution after the 2012 MIS.

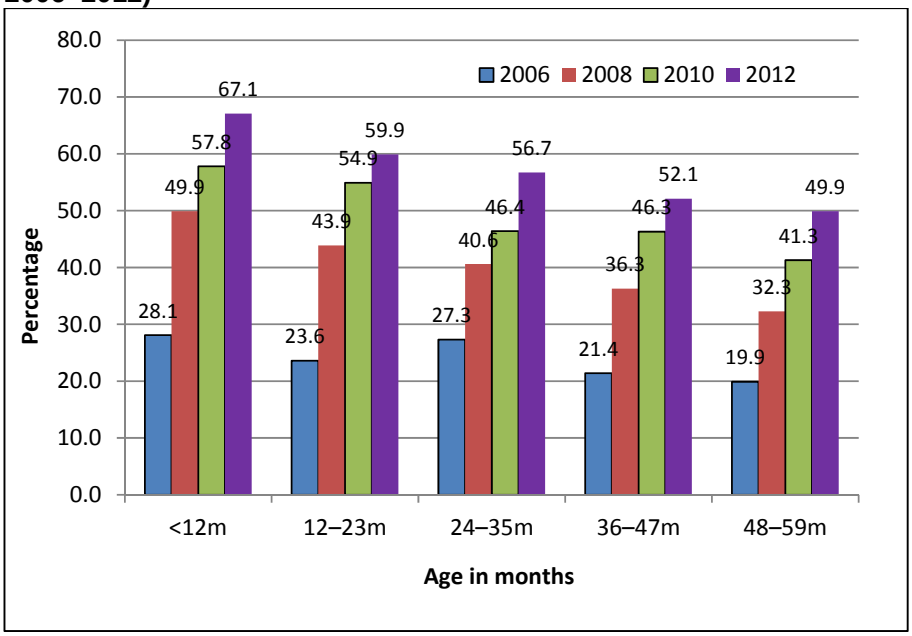
Figure 19. Percentage of households with an insecticide-treated net (ITN)-to-sleeping-space ratio of least one to one (Zambia 2008–2012)



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 2012 (**Figure 20**).

Figure 20. Insecticide-treated net (ITN) use by children under age five years by age (Zambia 2006–2012)



Since 2006, ITN usage among children under age five years has been higher in rural settings (**Figure 21**). This likely due to the malaria control program prioritizing ITNs for distribution to rural areas. In particular, Lusaka district, the largest urban area in the country, has not been prioritized for ITN distribution because of the low level of malaria. ITN usage rates among children under five have increased between each survey from 2006 to 2012.

Figure 21. Insecticide-treated net (ITN) use by children under age five years by rural and urban areas (Zambia 2006–2012)

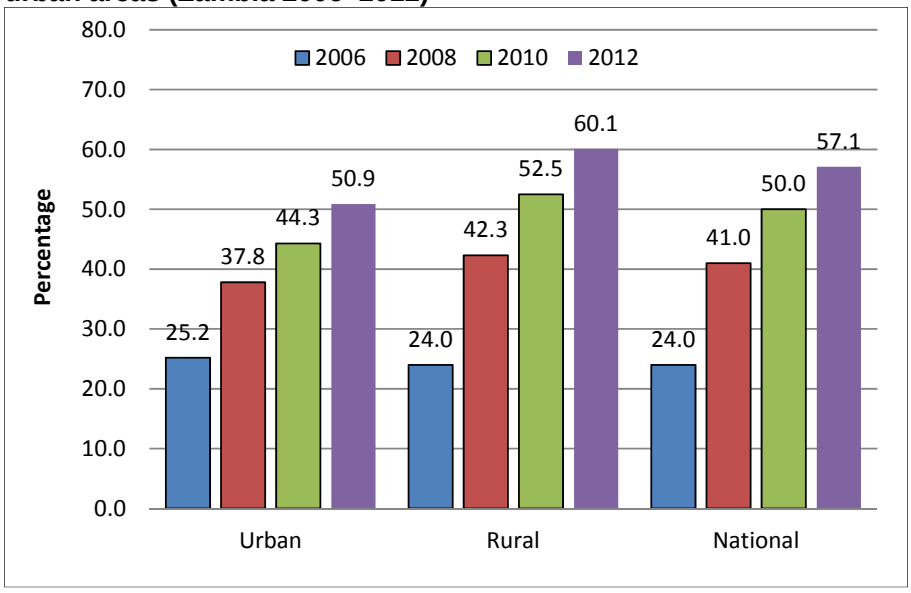


Figure 22 shows that ITN use among children has varied by province since 2006. ITN usage in Southern, Central, North-Western, and Western provinces declined between 2010 and 2012, whereas all other provinces reported an increase in ITN use among children from 2010 to 2012. Seven of the ten Zambian provinces reported at least 50% of children sleeping under an ITN by 2012, including the areas with the highest level of malaria burden.

Figure 22. Insecticide-treated net (ITN) use by children under age five years by province (Zambia 2006–2012)

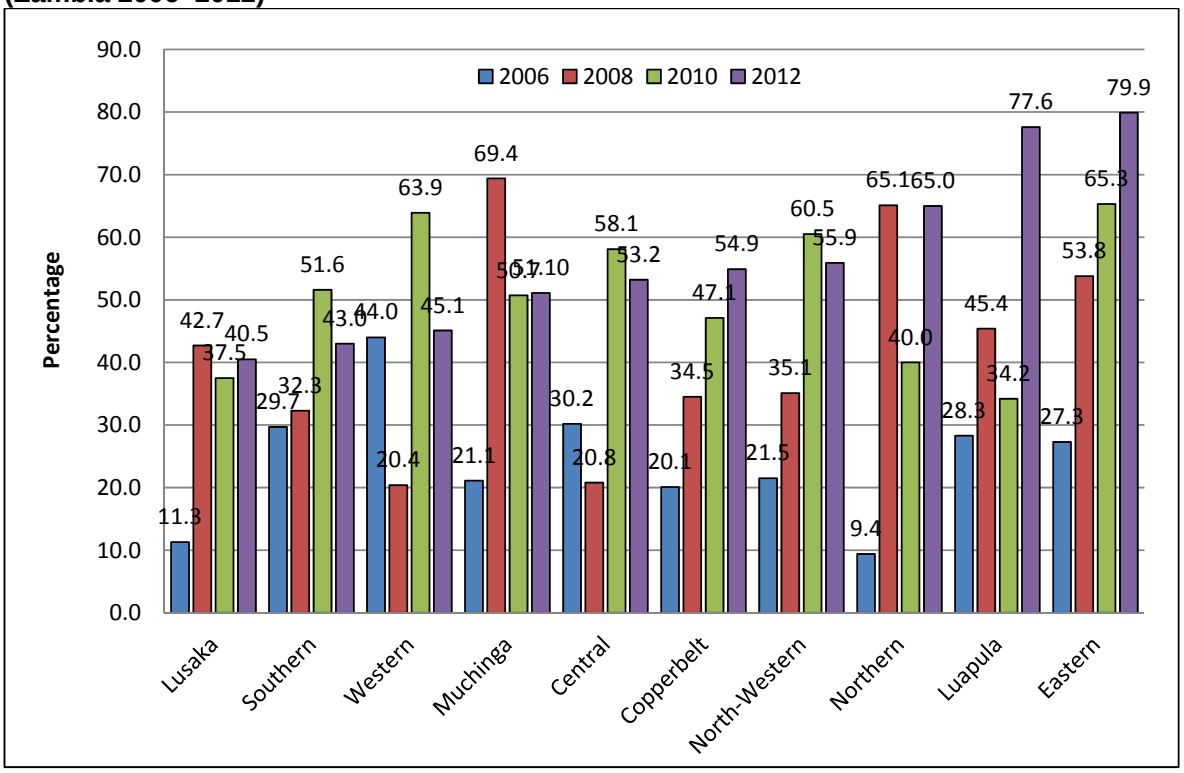
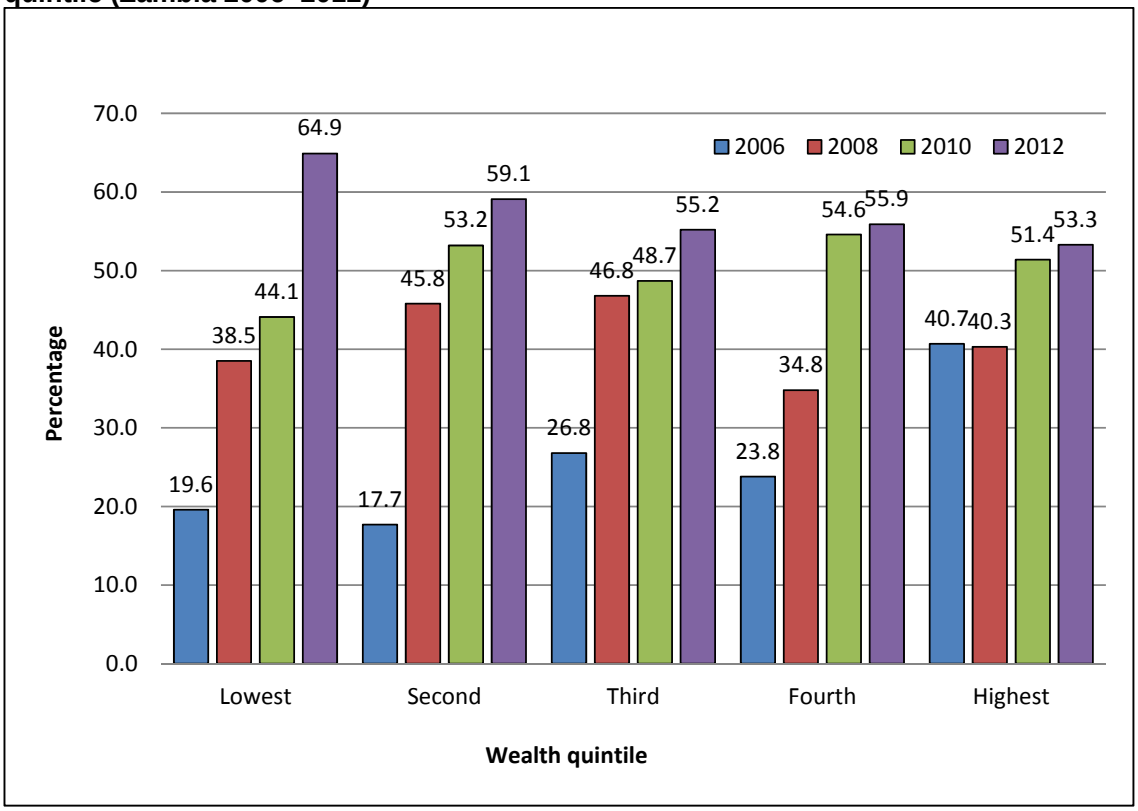


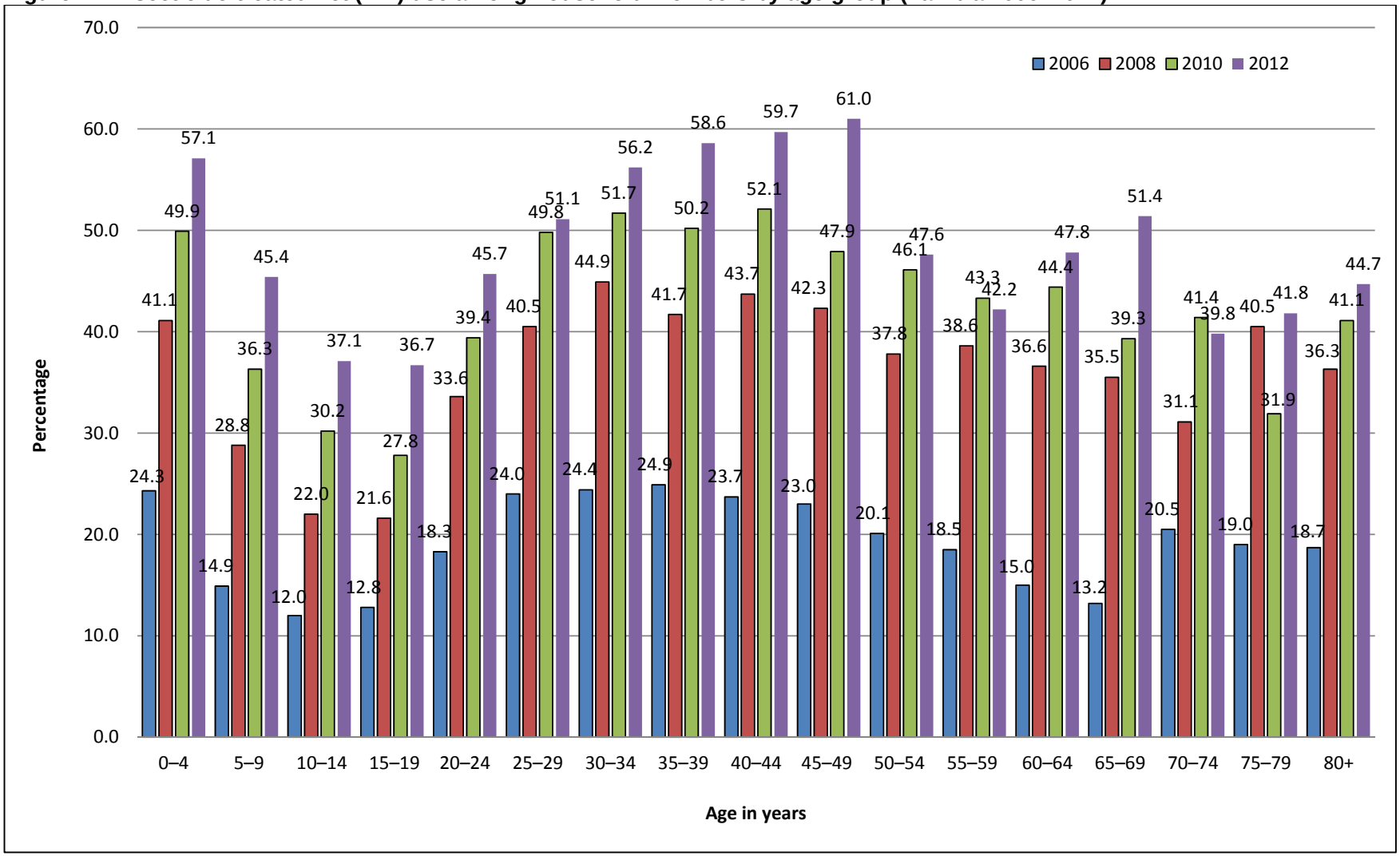
Figure 23 shows ITN use by wealth quintile. Results from the 2006 to 2012 surveys show that ITN use was initially higher in the highest wealth quintile than in lowest quintile. However, this disparity was reduced between 2008 and 2012. Between 2010 and 2012, ITN use increased the most in the poorest households.

Figure 23. Insecticide-treated net (ITN) use by children under age five years by wealth quintile (Zambia 2006–2012)



Among all household members, **Figure 24** presents the trends, by age category, in ITN use the night before the survey. Age trends in ITN use were consistent across all four 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, to 48.9% in 2012.

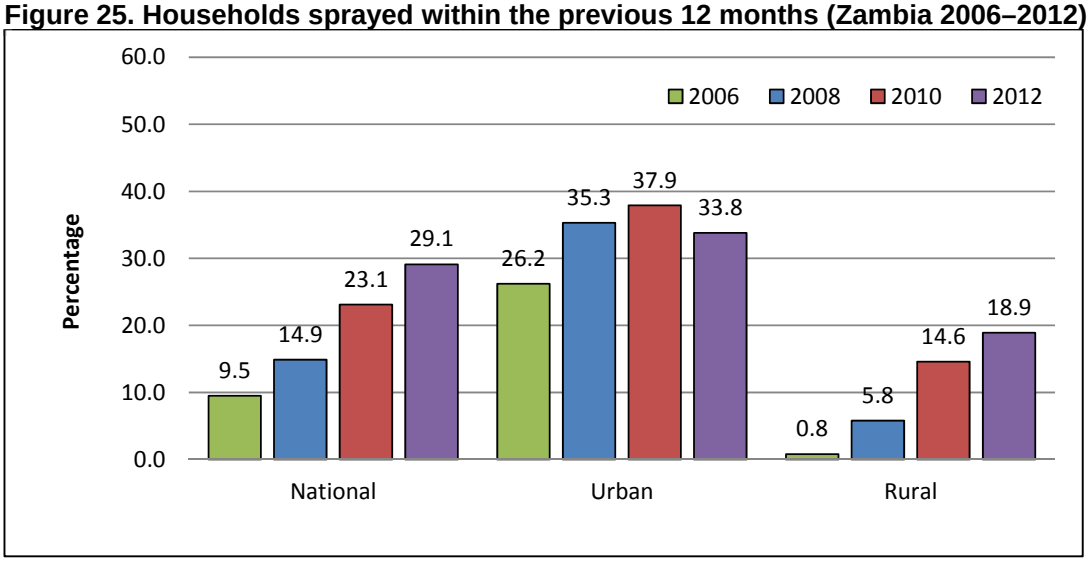
Figure 24. Insecticide-treated net (ITN) use among household members by age group (Zambia 2006–2012)



Indoor residual spraying

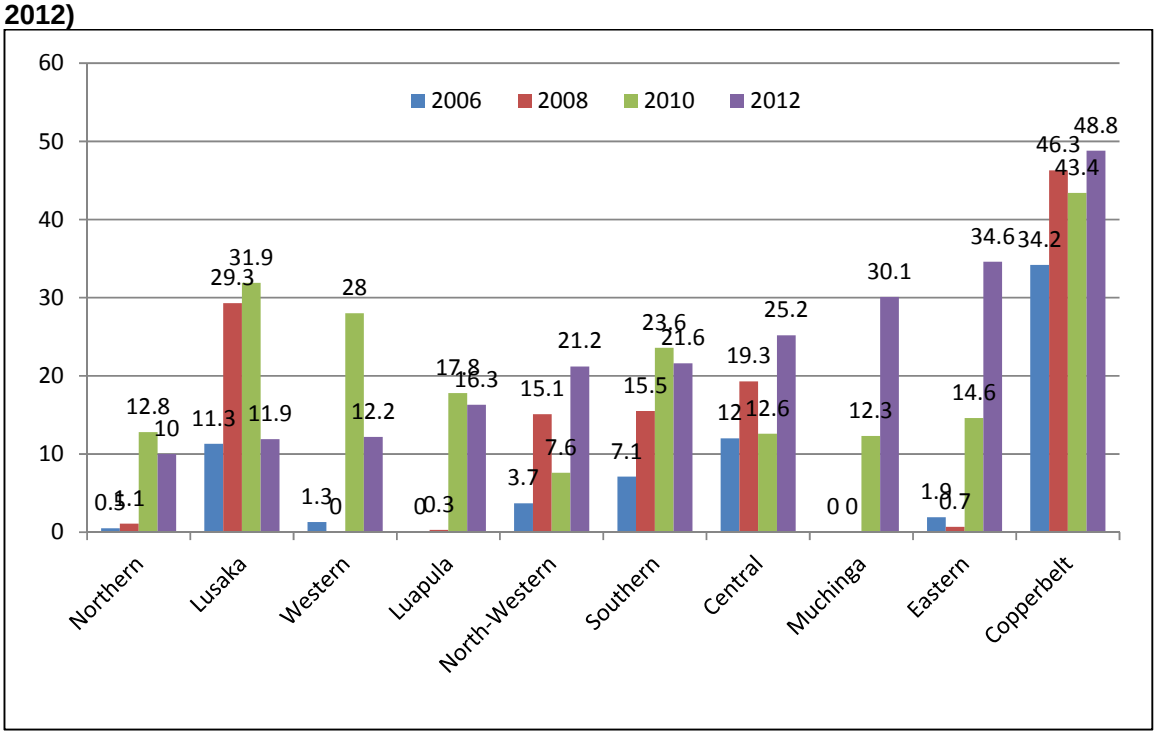
Over the last several years, Zambia has increased the number of districts where IRS is deployed—from 15 districts in 2005–2006 to 36 districts in 2009, to all districts during the 2011–2012 spray season. IRS activities continue to expand within existing spray districts as funding allows. Although IRS initially was targeted toward urban and peri-urban areas of selected districts, since 2007 an increasing number of rural areas have also been sprayed to align service delivery better with malaria burden. Nationally, reported IRS coverage rates have increased from 9.5% in 2006 to 29.1% in 2012 (**Figure 25**). This increase is most obvious in rural areas where in 2006, very few rural households reported spraying, but by 2012, nearly 19% of households reported spraying. IRS coverage declined in urban areas in 2012 compared to 2010 due to an emphasis among districts in prioritizing spraying to more malarious rural areas of targeted districts.

Figure 25. Households sprayed within the previous 12 months (Zambia 2006–2012)



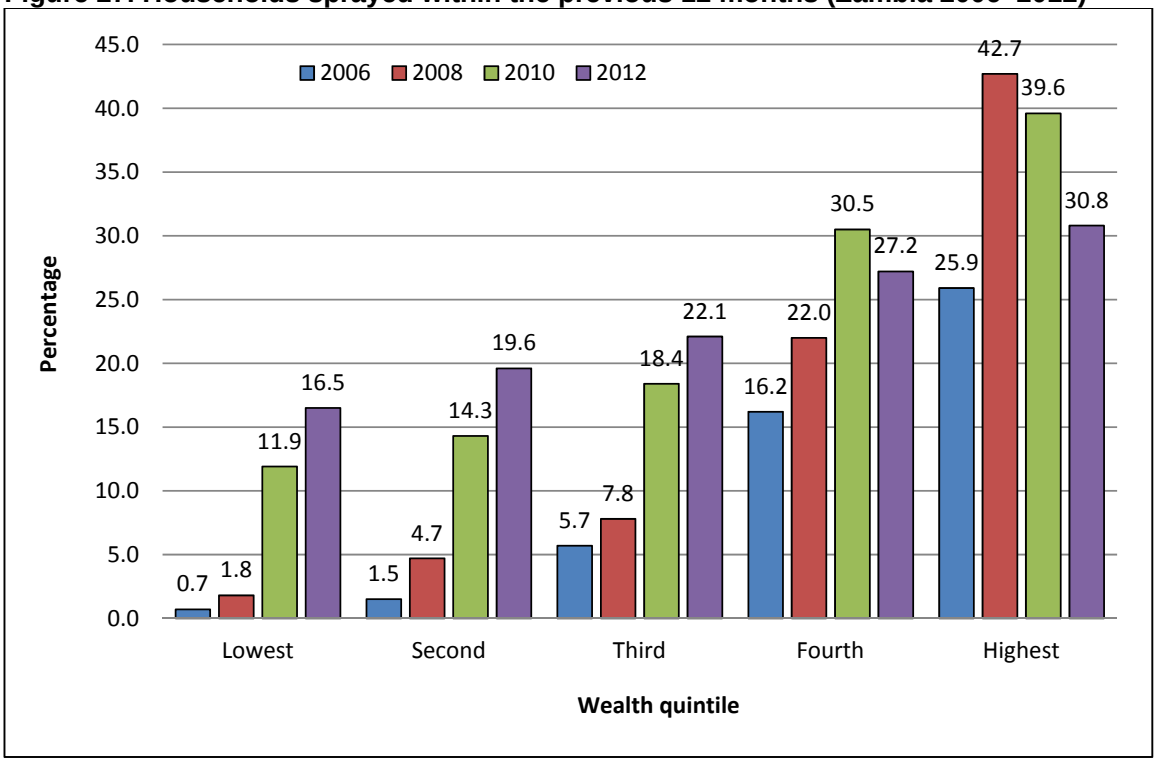
By province, IRS activities have continued to scale up in many areas of the country over the long term, although Western and Lusaka provinces reported a decline in spraying during the previous 12 months. Areas in North-Western, Central, Muchinga, and Eastern provinces reported the most dramatic increases in IRS coverage. Northern, Luapula, and Southern had little to no change in IRS coverage between 2010 and 2012.

Figure 26. Households sprayed within the previous 12 months, by province (Zambia 2006–2012)



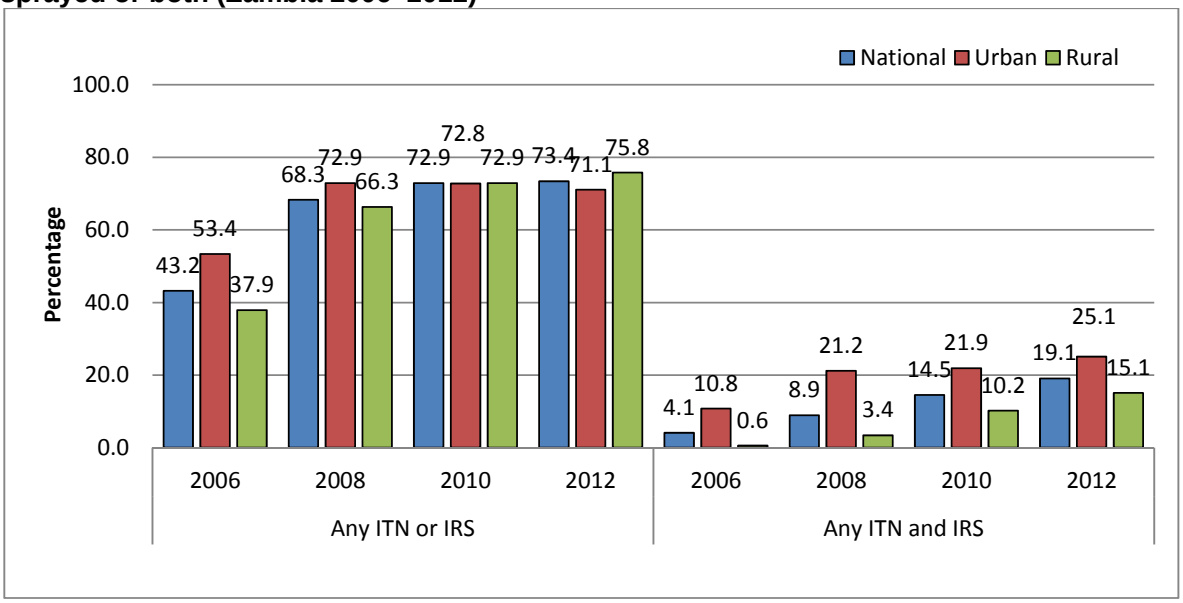
When an asset-based wealth index is considered, urban areas are more likely to account for higher wealth quintiles and therefore IRS tends to target wealthier households in urban and peri-urban areas **(Figure 27)**. By wealth quintile, IRS targeted a much larger share of the poorest households by 2012 than in previous years.

Figure 27. Households sprayed within the previous 12 months (Zambia 2006–2012)



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 from 2006 to 2012 is presented in **Figure 28**. In 2006, 43.2% of households reported having either an ITN or IRS. This increased to 73.4% by 2012. For households reporting having both at least one ITN *and* their house sprayed, the percentage increased from 4.1% in 2006 to 19.1% in 2012. Throughout this time period, the combined intervention was more likely to be reported in urban areas. However, the increase in the availability of both interventions in the household was more dramatic in rural households, mainly due to the expansion of IRS services into rural areas since 2008.

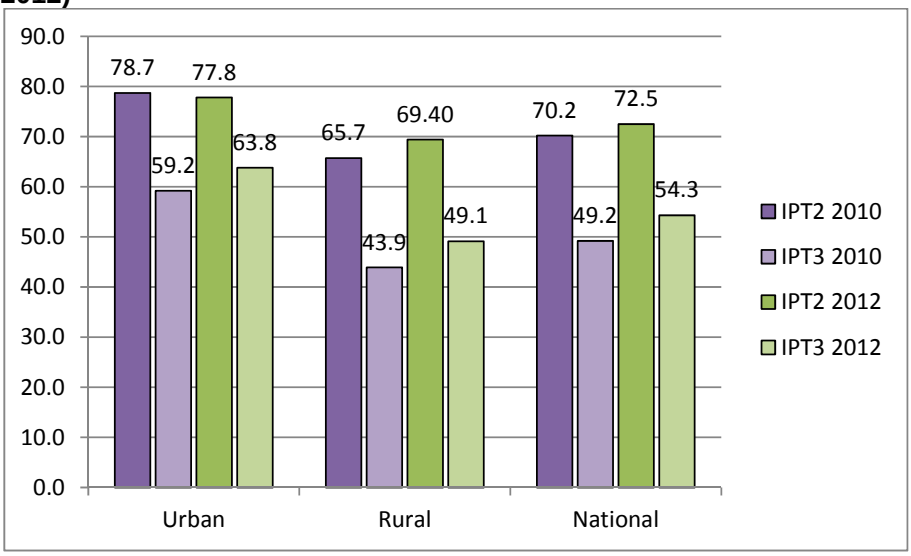
Figure 28. Households reporting either at least one insecticide-treated net (ITN) or house sprayed or both (Zambia 2006–2012)



Intermittent preventive treatment during pregnancy

Zambia is one of the leading countries in Africa for coverage of intermittent preventive treatment during pregnancy (IPTp). **Figure 29** presents coverage results among women with a recent birth from 2010 and 2012 for IPTp two doses and three doses. An increasing percentage of women reported IPTp two doses and three doses in 2012 with more than half (54.3%) of pregnant women reporting at least three doses.

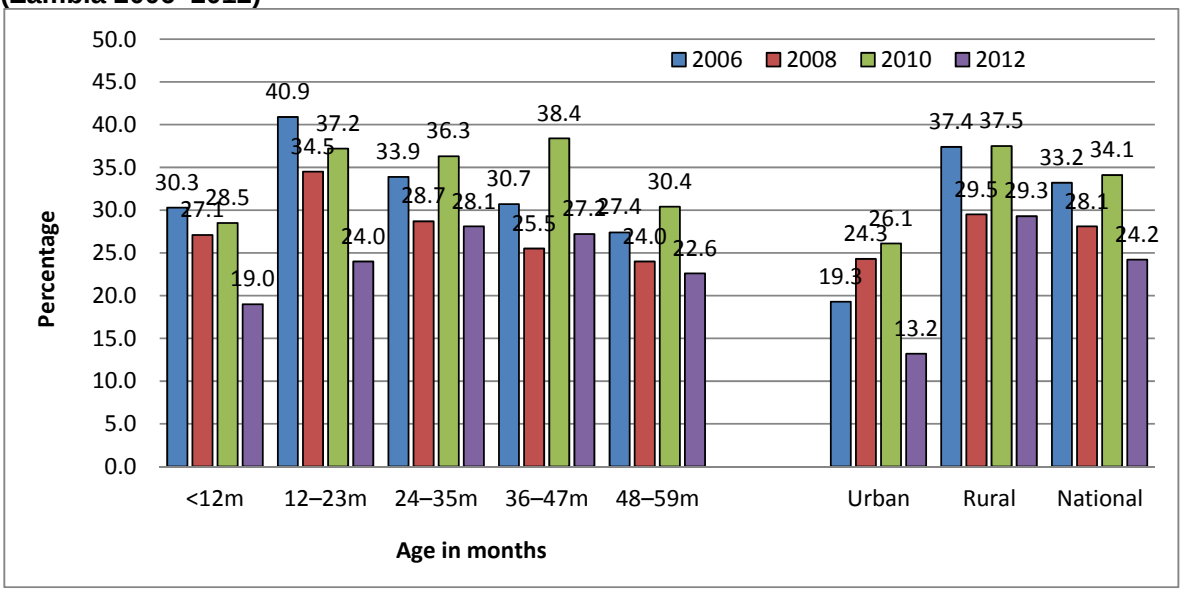
Figure 29. Women with recent births reporting coverage of intermittent preventive treatment during pregnancy (IPTp) two doses and three doses, by urban and rural areas (Zambia 2010–2012)



Fever prevalence and antimalarial treatment

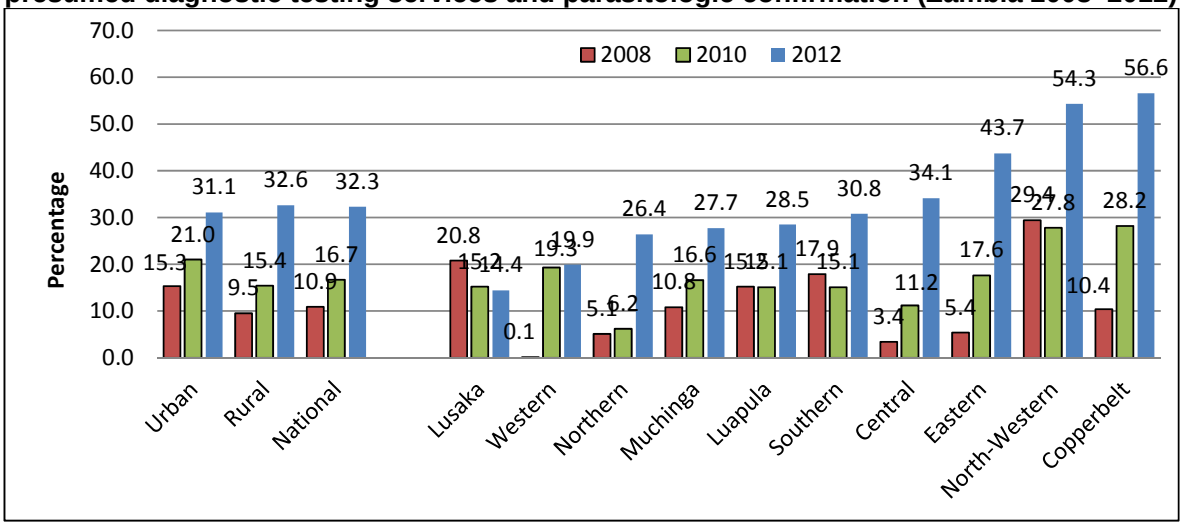
Fever prevalence among children under age five years fluctuated throughout the surveys conducted from 2006–2012. **Figure 30** represents fever prevalence among children during the two weeks preceding the survey by age and by urban and rural areas. The trend in fever prevalence follows a similar pattern to malaria prevalence among children under five years by age with initial lower levels among those younger than one, peaking by age two, and then a steady decline after. All categories presented reported less fever in 2012 than 2010.

Figure 30. Fever prevalence in the preceding two weeks among children under age five years (Zambia 2006–2012)



Since 2008, malaria surveys have asked questions on the prevalence of finger sticks for febrile children who sought care for fever. This can provide some insight as to the availability of diagnostic testing services and thus parasitologic confirmation for children with malaria symptoms. **Figure 31** shows that the percentage of febrile children receiving finger sticks during care-seeking increased dramatically since 2010, nearly doubling nationally; this increase was seen in rural and urban areas. All provinces reported large increases in the percentage of febrile children receiving finger sticks, except for Lusaka and Western provinces, which showed little or no change since 2010. While it is difficult to ascertain facility-level clinical practices from household surveys, it is assumed that many of the finger sticks are likely malaria RDTs, which have been scaled up throughout the country since 2007.

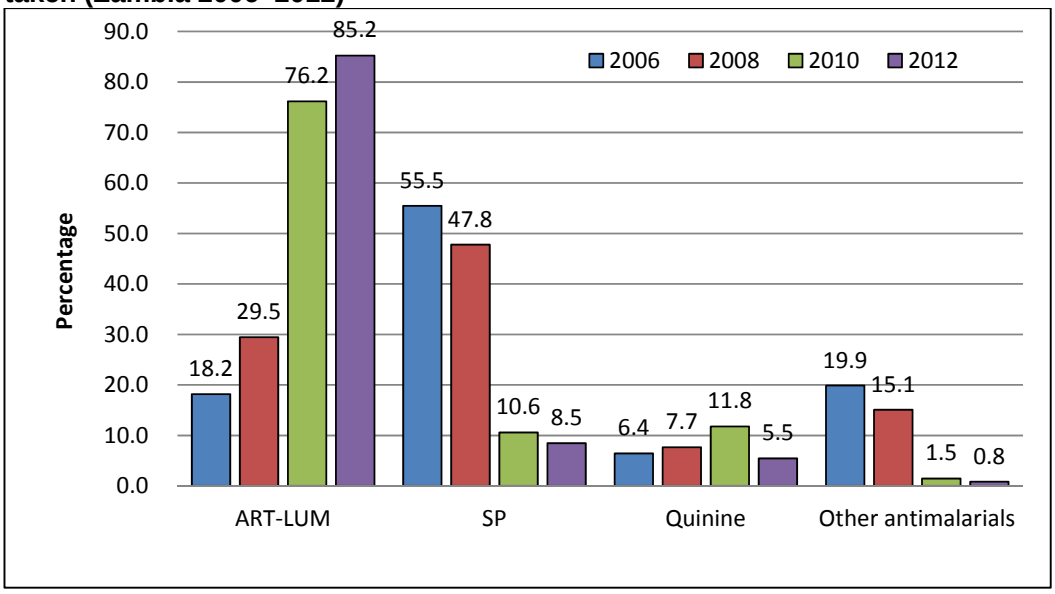
Figure 31. Percentage of febrile children under age five years with a reported finger stick for presumed diagnostic testing services and parasitologic confirmation (Zambia 2008–2012)



Antimalarial treatment practices among febrile children have also shown dramatic changes since 2006. Overall treatment of febrile children with antimalarial drugs declined from 52.8% in 2006, to 43.1% in 2008, to 34% in 2010, but in 2012 the percentage slightly increased to 36.9%. Due to the increasing availability of malaria RDTs, it is assumed that this 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 2012). 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 32** shows that ART-LUM, which is 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 change 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 2012.

Figure 32. Among febrile children taking antimalarial drugs, the percentage of each drug taken (Zambia 2006–2012)



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. For example, nearly all women (more than 95%) surveyed in 2008 through 2012 have heard of malaria. An increasing number of women interviewed between 2008 and 2012 reported fever as symptom of malaria (71.1% in 2008, 75.3% in 2010, and 75.5% in 2012). Use of mosquito nets or ITNs have consistently been reported most often as a malaria prevention method in 2008 through 2012, with an increasing number of women reporting a treated net versus just any net.

Chapter 7: Conclusions

The Zambia National Malaria Indicator Survey 2012 builds on more than seven years of focused measurement activities to document progress toward the 2006–2010 and 2011–2015 National Malaria Strategic Plans. This survey is the fourth Malaria Indicator Survey over this period, and complements the Demographic and Health Survey 2007 as well.

Taken together, the results from four Malaria Indicator Surveys from 2006 through 2012 demonstrate continuous steady progress in scaling up intervention coverage and reducing the burden of malaria parasitaemia and anaemia. The year 2008 stands out as a time of unusually low malaria parasite prevalence and severe anaemia relative to all other measurements. If one considers this year as an anomaly, driven by favourable climatic and meterological conditions for reduced malaria transmission in addition to the successes early on in scaling prevention interventions and effective treatment, the remaining three surveys suggest consistent progress across all major indicators at improving malaria intervention coverage and reducing malaria burden.

Malaria parasite prevalence as measured by slide microscopy showed a slight decrease to 14.9% in 2012 compared to the 2010 level of 16.0%. This was largely a reduction in prevalence seen in those areas that were targeted heavily by mass ITN distributions, namely Luapula province, and also reductions in Copperbelt province, likely the result of insecticide rotation for IRS activities as a result of the 2010 MIS results and increased evidence of resistance to previously used insecticides. What is not well explained by the current description of results is the increasing disparity between positivity rates observed by microscopy and those observed by RDTs between 2010 and 2012. Further analysis is required to understand the performance of the new RDT used during 2012. Severe anaemia results reflect a similar situation to the parasite prevalence in that the greatest reductions in this indicator of more chronic malaria exposure were observed in areas with the highest levels of coverage interventions, notably in Luapula province. Nationally, severe anaemia prevelance dropped from 9.0% in 2010 to 6.8% in 2012.

Insecticide-treated net distributions that occurred after the 2010 MIS and prior to the 2012 MIS resulted in significantly higher and sustained coverage levels in areas targeted during this period, notably, Luapula, Northern, and Eastern provinces. Luapula province reported 90% of households with at least one ITN, and Eastern and Northern provinces reported more than 80% coverage with one ITN. These very high coverage levels were achieved with focused house-to-house distribution strategies targeting all household sleeping spaces and intensive engagement at community level. These efforts were carefully planned and allocated sufficient resources for distribution costs of roughly US$1 per ITN distributed. Very importantly, these survey results suggest the **quality** of ITN distributions—as measured by the levels of full coverage, ITNs-to-sleeping-space ratio, and all household members using a net—continued to rise relative to the more general coverage indicator of households with at least one ITN. More than half the households (55%) in Zambia reported sufficient ITNs to cover all sleeping spaces and nearly half (49%) of all household members nationally reported sleeping under ITNs. These are important indicators for the success of ITN distribution efforts targeting everyone, including the most vulnerable populations of pregnant women and children.

For ITN coverage, one significant challenge that remains is reaching the persistently under-covered, farthest-to-reach areas that comprise the majority of the remaining 30% of households without a single ITN. It is essential to continue to improve the quality of distributions and to prioritize resources for house-to-house distribution for those populations that do not access routine distributions through antenatal care and in areas that are the most difficult to reach. In addition, the swings in ITN coverage from one survey to another will persist as a reflection of the rolling nature of the ITN distribution campaigns. In order to address this, the current National Malaria Strategic Plan 2011–2015 recommends the approach of consolidating ITN distributions within a calendar year prior to planned measurements and with a frequency of every two to three years, with regular routine coverage supplied by antenatal distributions and the private sector and specialized distributions for

vulnerable populations in the interim. Commitment to this approach would help to rectify, for example, the results observed during the 2012 MIS where Western province showed a decrease in ITN coverage and usage and an increase in malaria parasite and severe anaemia prevalence. ITN distributions for Western were planned for mid to late 2012—after the MIS was concluded—as a result of donor procurements and the cycles of the rolling ITNs distributions.

Indoor residual spraying continued to demonstrate progress in expansion to more malarious rural areas of the country at the expense of urban and peri-urban areas as well as in rebalancing the issue of equity from the least poor households to the poorest households. Nationally, 30% of households reported being sprayed within the previous year, with nearly 20% of rural households reporting being sprayed. The government IRS program continues to be the largest supplier of IRS services; the private sector continues to play a significant role in IRS activities mainly in the mining areas of Copperbelt province.

Zambia remains one of the leading countries on the continent in provision of intermittent preventive treatment during pregnancy, in terms of two and three dose provision of SP. Nearly 50% of women with recent pregnancy reported receiving at least three doses of IPTp, and 73% of women reported at least two doses of IPTp.

Overall, ART-LUM continues to trend upward as the preferred antimalarial drug that febrile children received according to national policy. Among antimalarials received by febrile children, 85% of children reported receiving ART-LUM, still a highly efficacious antimalarial treatment. This improvement in treatment practice is in spite of decreasing fever prevalence and increasing reported uptake of diagnostic testing with finger sticks. More than half (57%) of febrile Zambian children reported receiving a finger or heel stick in 2012 during their care-seeking experience. This is a remarkable increase over 2010 and likely reflects the growing trend in offering testing services for malaria care across the country that has resulted from the scale-up of rapid diagnostic tests.

Overall, the MIS 2012 shows continued progress in offering malaria control services by the Ministry of Health and partners. The evidence presented in this report points to several directions that should be noted. In summary, the current interpretation of the Malaria Indicator Surveys suggests the following recommendations for national malaria control efforts:

1. Changes in parasite prevalence and severe anaemia, while reduced in some areas, have stagnated in several key areas of the country. It is recommended to examine approaches to maximizing the use of existing prevention and treatment interventions in combination to exact the greatest impact on localized malaria burden.
2. Re-establish high ITN ownership and use in areas of the country that dropped between 2010 and 2012 including Southern, Western, and Central provinces and encourage continued sustained coverage of ITN uptake and usage among all households and household members throughout the country.
3. The effort to reach the last 26% of households with malaria prevention is likely to be more difficult than reaching the 74% presently covered with ITNs or IRS. The National Malaria Control Program recommends house-to-house distribution for replacement and current strategies should align to attain the highest coverage possible. Full coverage at community level benefits all members of the community, including the most vulnerable populations of children under five and pregnant women.
4. Continue to strategically offer IRS services to areas with malaria to maximize the potential of malaria burden reduction, complementing current IRS and ITN efforts and in conjunction with an integrated vector-management framework.
5. Continue to 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.

This report presents valuable evidence to guide the National Malaria Control Program for the next few quarters to improve service delivery and track progress against national, regional, and international targets.

Additional resources

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Appendix A: Sample design

Introduction

The Malaria Indicator Survey (MIS) 2012, 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 2012 MIS.

Sampling frame and stratification

Zambia is administratively divided into ten (10) provinces. Each province is in turn subdivided into districts. Each district is further subdivided into constituencies and wards. In total, Zambia has 74 districts; 150 constituencies and 1,421 wards. For statistical purposes each ward is subdivided into Census Supervisory Areas (CSAs) which, in turn, are subdivided into Standard Enumeration Areas (SEAs). The SEAs which are geographical areas, classified as either rural or urban, have information on number of households and the population size. This demarcation is done through a mapping exercise.

Prior to the 2010 Census of Population and Housing, the Central Statistical Office (CSO), conducted a mapping exercise. Based on the 2010 Census results, data collected during the mapping exercise was updated. The updated list of Standard Enumeration Areas (SEAs) was the sampling frame for the Malaria Indicator Survey (MIS). The frame has 25,631 SEAs and 2,513,768 households.

The number of households was used as a measure of size for selecting primary sampling units. The SEAs are also stratified by urban and rural designations.

Sample allocation and selection

The 4000 households were initially allocated between rural, urban, and the IRS in proportion to the population of each domain according to the 2010 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

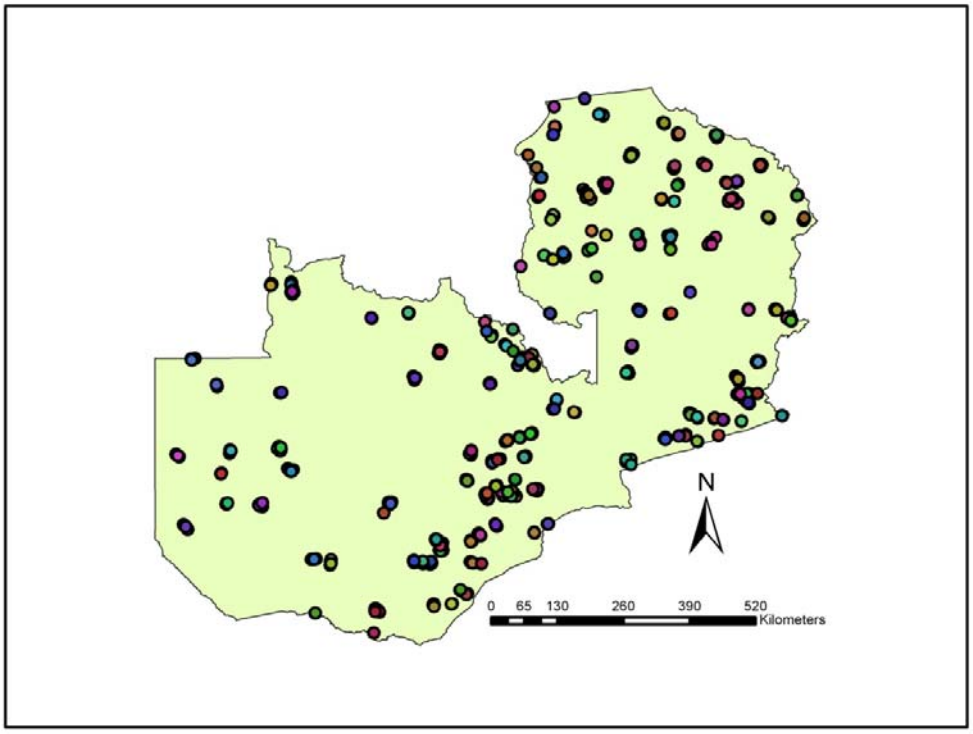
Domain	Proportion of households based on 2010 Census frame	Proportional allocation of sample households	Adjusted sample households	Number of clusters
IRS over sample	0.177	709	600	24
Rural	0.417	1,668	2,600	104
Urban	0.405	1,620	800	32
Total	**1.0**	4,000	4,000	160

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	1	14	2
Copperbelt	16	4	2	10
Eastern	23	5	17	1
Luapula	17	2	14	1
Lusaka	17	2	3	12
Muchinga	11	2	8	1
Northern	17	1	15	1
North-Western	9	1	7	1
Southern	21	4	14	3
Western	12	2	10	0
Total	**160**	**24**	**104**	**32**

Figure A.1. Sample clusters included Zambia MIS 2012



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 2010 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	800	3,200	4,000
Occupied households	781	3,126	3,907
Interviewed households	750	3,050	3,800
Household response rate (HRR)	96.0%	97.6%	97.3%
Interviews with women			
Number of eligible women	897	2,740	3,637
Number of eligible women interviewed	750	2,450	3,200
Eligible women response rate	83.6%	89.4%	88.0%

Appendix B: Survey personnel

Survey coordination, management, analysis and writing

Dr Peter Mwaba	Ministry of Health
Dr Elizabeth Chizema	Ministry of Health
Dr Mulakwa Kamuliwo	Ministry of Health
Mercy Mwanza	Ministry of Health
Busiku Haimanza	Ministry of Health
Moonga Hawela	Ministry of Health
Dr Peter Mumba	HSSP
Brian Chirwa	HSSP
Patrick Chewe	HSSP
Dr Allen Craig	President's Malaria Initiative (PMI)
John Miller	PATH MACEPA
Dr Fred Masaninga	World Health Organization

Sample design and selection

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Jacob Chirwa	Ministry of Health
Timothy Nzangwa	Improving Malaria Diagnostics
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Wendy Muzuni	

Personal digital assistant (PDA) programming

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Field work teams

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Mary Kavimbi	Nurse/team leader
Banda Evelyn Kasukumya	Nurse/team leader
Gilberta Mukuka Chama	Nurse
Febby Phiri Banda	Nurse
Theresa Chama Ngulube	Nurse
Francis Ngulube	Lab technician
Elemson Eric Ndhlovu	Lab technician
Geshom Musenge	Enumerator
Sinyemba Sinyemba	Enumerator

Copperbelt Province

Masoke Tembo	Lab technician
Gladys Mwamba Mulenga	Nurse
Melody Musoyo Mwebela	Nurse/team leader
Timothy Mvula	Lab technician
Agripa Mwiinga	Enumerator

Eastern Province

Nelson Kumwenda	Lab Technician
Josephine Chatama Mumbi	Nurse/team leader
Rabecca Ngwira	Lab Technician
Evalyn Mwale Phiri	Nurse
Rodgers Musonda	Lab technician
Nora Chipeta	Nurse/team leader
Joyce Nawakwi	Nurse
Mary Muyembe Simalimbu	Lab technician
Comfort Zyambo	Lab Technician
Boneventure Chilopa	Enumerator

Luapula Province

Ennie Zyambo	Lab Technician
Swema Manda Banda	Nurse
Chituki Mwenya	Lab Technician
Grace M. Kazimoto Mumba	Nurse/team leader
Mwansa Kapoka	Enumerator

Lusaka Province

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Concillia Mutukwa	Lab technician
Kanji Munkombwe	Lab technician
Beatrice Kangwa Chirwa	Nurse
Owen Mukonka Sikanyiti	Enumerator
Doris Nkowani Mwanza	Nurse
Alice Kumwenda	Nurse
Proscovia Miiye Banda	Lab technician
Malama Chakulanda	Lab technician
Justine Hambaba	Enumerator

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Angel Chinaka	Lab technician
Joseph Siwiti	Lab technician
Enelesi Lukhelo Banda	Nurse
Gift Mwenya	Enumerator

Northern Province

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Geofrey Chitundu	Lab technician
Melody P Chisopo Shawa	Nurse
Musonda Mabengwa	Lab technician/Team Leader
Edward Phiri	Enumerator

North-Western Province

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Stanley Chinyanta	Lab technician /team leader
Chiwela Kasanda	Lab technician
Jesse Zulu	Nurse
Steve Makina	Enumerator

Southern Province

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Gladys Yanduli	Nurse
Chuki Mvula	Lab technician

Sharon Mumba	Lab technician
Conrad Sikanyiti	Enumerator
Mable C. Mwaba	Nurse/team leader
Manyepa Mespa	Lab technician
Lebitina Banda	Lab technician
Logging Hachingabula	Nurse/team leader
Ernest Mpatishya	Enumerator

Western Province

Ireen Mubita	Nurse
Ackson Mkandawire	Lab technician
Phyllis Jere Mbinga	Lab technician/team leader
Evelyn N. Simasiku	Nurse
Tabakamulamu Liswaniso	Enumerator

Appendix C: Questionnaires

Zambia Malaria Indicator Survey 2012

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.

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)
			M F	YES NO	YES NO	IN YEARS	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	
01			1 2	1 2	1 2						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)
			M F	YES NO	YES NO	IN YEARS	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	TIME (24 Hours)	
06			1 2	1 2	1 2						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] Electricity? A radio? A television? A mobile telephone? A non-mobile telephone? A refrigerator? A bed? A chair? A table? A Cupboard? A sofa? A clock? A fan? A sewing machine? A cassette player? A plough? A grain grinder? A VCR/DVD? A tractor? A vehicle? A hammer mill?	YES NO ELECTRICITY 1 2 RADIO 1 2 TELEVISION 1 2 MOBILE TELEPHONE 1 2 NON-MOBILE TELEPHONE 1 2 REFRIGERATOR 1 2 BED 1 2 CHAIR 1 2 TABLE 1 2 CUPBOARD 1 2 SOFA 1 2 CLOCK 1 2 FAN 1 2 SEWING MACHINE 1 2 CASSETTE PLAYER 1 2 PLOUGH 1 2 GRAIN GRINDER 1 2 VCR/DVD 1 2 TRACTOR 1 2 VEHICLE 1 2 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 / /

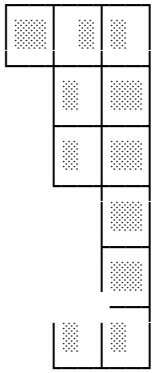
41	CHECK 34: NUMBER OF CHILDREN WITH HAEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 36.[1] NONE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT 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 2012

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	4	REFUSED	7	OTHER _____ (SPECIFY)
2	NOT AT HOME	5	PARTLY COMPLETED		
3	POSTPONED	6	INCAPACITATED		

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.

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 (2)	→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_____ (SPECIFY) F OTHER DRUGS ASPIRIN ..... G ACETAMINOPHEN/ PARACETAMOL ..... H IBUPROFEN ..... I OTHER _____ (SPECIFY) X DON'T KNOW ..... Z	ANTIMALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D COARTEM / ACT ..... E OTHER ANTIMALARIAL_____ (SPECIFY) F OTHER DRUGS ASPIRIN ..... G ACETAMINOPHEN/ PARACETAMOL ..... H IBUPROFEN ..... I OTHER _____ (SPECIFY) X 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 ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 328)	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 328)
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 ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 332)	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 332)
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: Where did you get the Quinine first?	AT HOME ..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER ..... 3 PRIVATE HEALTH FACILITY/WORKER ..... 4 SHOP ..... 5 OTHER_____6 (SPECIFY)	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	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: _____