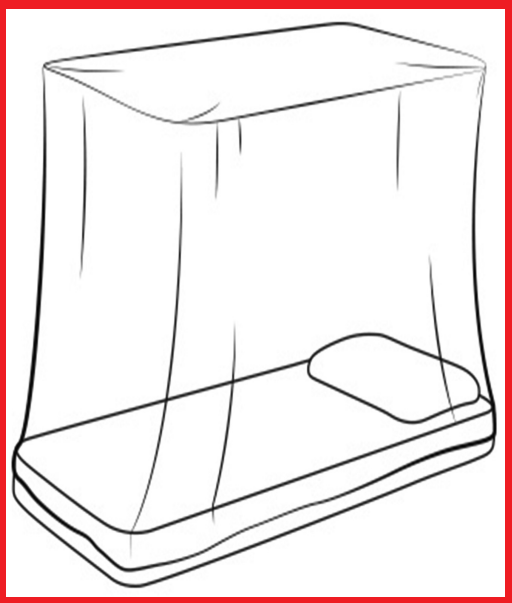
MALARIA INDICATOR SURVEY 2013



National Malaria Control Programme
Directorate of Preventive Health Services

REPUBLIC OF SOUTH SUDAN

MINISTRY OF HEALTH

PREFACE

Malaria continues to be a major public health problem in the Republic of South Sudan. According to the Malaria Indicator Survey 2009, the parasite prevalence ranged from less than 1% in the mid northern area to more than 40% in the greater Equatoria region. Its effects are greatest among children under age 5 and pregnant women. The Ministry of Health, in collaboration with its partners, has been implementing the National Malaria Strategic Plan 2016–2013 that is currently being reviewed; its goal is to achieve universal coverage in the prevention and treatment of malaria.

The Ministry of Health Republic of South Sudan, together with partner organizations, has mounted a concerted response focused on scaling up malaria prevention, diagnosis and treatment interventions–especially for pregnant women and children under 5 years who are particularly vulnerable. Considerable funding support for malaria control and prevention has been received from the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM) and other donors.

The 2013 South Sudan Malaria Indicator Survey (SSMIS) is the country's second nationally representative assessment of the coverage attained by key malaria interventions. These interventions are used in combination with measures of malaria-related burden and anaemia prevalence testing among children under age 5 and pregnant women.

Overall, there has been some progress in controlling malaria though we noted an increase in malaria prevalence using RDT for children under 5 from 25 percent in 2009 to 30 percent in this survey but a slightly no change in prevalence using microscopy. ITN ownership has increased from 53 percent in 2009 to 66 percent in the 2013 MIS. Since most ITNs are long lasting, we expect this coverage to increase further with continued mass distribution of LLINs. Similarly, use of ITN has increased for both children under 5 from 25 percent in the MIS 2009 to 46 percent and pregnant women from 36 percent in 2009 MIS to 50 percent. The coverage of pregnant women who receive at least two doses of intermittent preventive treatment (IPTp) has increased from 13 percent in 2009 to 26 percent in 2013.

Special gratitude goes to the supervisors, interviewers, nurses, laboratory technicians, and drivers for their tireless efforts. The commitment of the entire field staff of the 2013 SSMIS to ensuring a successful conduct of the survey is commendable. We are also grateful to the respondents for their cooperation in the survey.

These results represent the combined work of various agencies contributing to the overall scale up of malaria interventions. We would like to request that all partners make use of the information presented in this report as they implement projects to overcome the challenges depicted here. The report presents national and regional estimates and thus provides a good representation of malaria situation in South Sudan, The National Malaria Control Program and all stakeholders will now know where to focus their efforts in designing interventions for malaria control. To ensure better understanding and use of these data, the results of this survey will be shared at different planning levels.

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Undersecretary, Ministry of Health

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ACKNOWLEDGEMENT

The successful execution of the 2013 Malaria Indicator Survey (MIS) required the input of various individuals and organizations. The survey was a joint venture between the Ministry of Health, Republic of South Sudan and its malaria support partners.

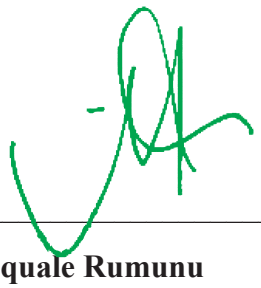
I take this opportunity to extend my heart felt thanks to the Minister of Health, Honorable Dr. Riak Gai Kok; the Undersecretary, Ministry of Health Republic of South Sudan, Dr. Makur Matur Kariom; the DG for External Relations and Coordination, Dr. Lul Riek Puot, the DG for Policy, Planning, Budgeting and Research, Dr. Richard Lino Loro Laku and all other DGs in the Ministry of Health not mentioned here, for providing overall strategic guidance for the MIS coordination committee. More importantly, I would like to thank the Survey Director Dr. Harriet Akello Pasquale and all the deputy survey directors from both the Laboratory Department of the Ministry of health and the National Bureau of Statistics for their untiring effort in planning and executing the survey.

I also acknowledge the critical contribution of the Malaria Technical Working Group (MTWG) members in planning, design and actual implementation of the 2013 Malaria Indicator Survey. Significant technical assistance was provided by Management Sciences for Health (MSH), Malaria Consortium (MC), Population Services International (PSI), World Health Organization (WHO), Interchurch Medical Assistance (IMA) and United Nations' Children Fund (UNICEF). The South Sudan National Bureau of Statistics (NBS) provided assistance to the MTWG in aspects of survey methodology and design, development of study tools and preparation of enumeration area (EA) maps.

Funding for the survey was provided by the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria through Population Services International, United States Agency for International Development (USAID) through Management Sciences for Health-SIAPS, World Health Organization, UNICEF and Roll-back Malaria (RBM) Partnership. The Ministry of Health would like to thank all the above organizations for the financial support.

I would also like to thank the National Malaria Control Programme (NMCP) for serving as the secretariat and coordinated all the survey activities. In this function the programme was supported by Management Sciences for Health – SIAPS and Malaria Consortium.

I am also grateful for the efforts of all officials at the national, state, county and lower levels who supported the planning and implementation of the survey. Finally, I would like to appreciate all the field workers and most importantly, would also like to thank the ten state Ministries of Health for their tireless efforts in coordinating and overseeing the survey activities and overseeing implementation of the survey.



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LIST OF ACRONYMS

ACT. . . . . .Artemesinin-combination therapy
ANC . . . . . .Antenatal Care
AS+AQ . . . . . .Artesunate plus Amodiaquine
CSA. . . . . .Census Supervisory Areas
DG. . . . . .Director General
DFID . . . . . .Department for International Development
DHS. . . . . .Demographic and Health Survey
EA . . . . . .Enumeration Area
GFATM . . . . . .Global Fund AIDS Tuberculosis and Malaria
GPS . . . . . .Global Positioning System
Hb . . . . . .Haemoglobin
HRP. . . . . .Histidine Rich Protein
HSSP. . . . . .Health Sector Strategic Plan
HSDP . . . . . . Health Sector Development Plan
IMA. . . . . .Interchurch Medical Assistance
IPT. . . . . .Intermittent Preventive Treatment
IRS . . . . . .Indoor Residual Spraying
ITN . . . . . .Insecticide Treated Net
LLIN . . . . . .Long Lasting Insecticide Treated Net
MC . . . . . .Malaria Consortium
MDG. . . . . .Millennium Development Goals
M & E . . . . . .Monitoring and Evaluation
MIS . . . . . .Malaria Indicator Survey
MOH . . . . . .Ministry of Health
MSH . . . . . .Management Sciences for Health
NGO . . . . . .Non Governmental Organization
NBS. . . . . .National Bureau Of Statistics
NMCP . . . . . .National Malaria Control Programme
PSI. . . . . .Population Services International
RDT. . . . . .Rapid Diagnostic Test
SEA. . . . . .Standard Enumeration Areas
SP . . . . . .Sulphadoxine-Pyrimethamine
SPLA. . . . . .Sudan People's Liberation Army
SSMIS. . . . . .South Sudan Malaria Indicator Survey
TOT. . . . . .Training of Trainers
TWG . . . . . .Technical Working Group
UNDP . . . . . .United Nations Development Program
UNICEF . . . . . .United Nations Children's Fund
WHO. . . . . .World Health Organization

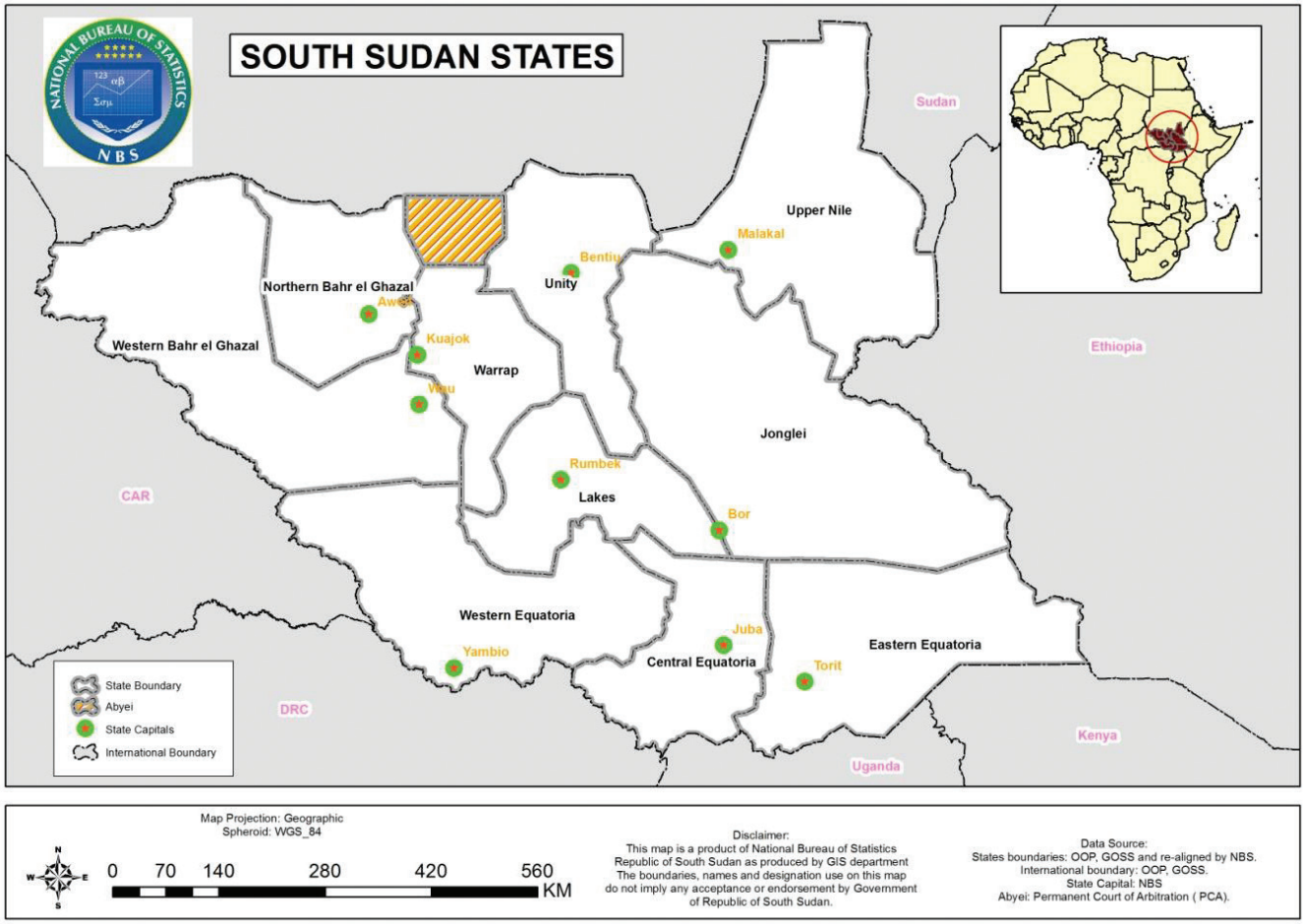
TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION 1

1.1 COUNTRY PROFILE



After decades of conflict between the northern and southern regions of Sudan which engulfed the country in two phases of civil war from 1955 to 1972 and 1983 to 2005 and resulted in the loss of 2.5 million lives. A Comprehensive Peace Agreement was signed in January 2005 between the Sudanese government and the Sudan People's Liberation Army (SPLA). One of the key clauses was the recognition of South Sudan's right to hold a referendum on whether to remain part of Sudan or secede to form a new nation. A referendum was held in January 2011 and resulted in a 98.8% approval of the option to secede. The Republic of South Sudan was established on July 9th 2011 and is therefore the youngest country in Africa.

Geography and Population

South Sudan is a land-locked country in East Africa, bordering six malarious countries: Central African Republic in the west, Democratic Republic of Congo in the southwest, Ethiopia in the east, Kenya and Uganda in the south and Sudan in the north. The country covers an area of approximately 650,000 km^2 of land mass, between 8° and 18° degrees south latitude and between 20° and 35° degrees east longitude, divided into 10 states with a total population of about 10 million as projected from the 2008 Population Census. The states are the basic planning levels for health service delivery. The climate is tropical with average temperatures ranging between 20°C and 37°C and relative humidity between 26% and 88%. Annual rainfall ranges between 1,000 mm in the South and 400 mm in the northern parts. Similarly, the duration of the rainy season varies from 7–8 months in the South to 5–6 months in the northern region. Malaria is endemic across the entire country with year-round transmission but peaking towards the end of the rainy season from September to November.

1.2 BACKGROUND ON MALARIA

The healthcare system in South Sudan suffers from poor infrastructure, inadequate equipment, insufficient number of trained medical staff, and severe underfunding; In 2011, only 2% of all government expenditures were allocated to health programs, in comparison with 29% for security and 7% for infrastructure. The Ministry of Health (MOH) operates a decentralised health care structure, in which services are structured into community, primary, secondary and specialised care levels linked by a referral system.

Malaria is the leading cause of morbidity and mortality in the country, accounting for 20% to 40% morbidity with over 20% of deaths reported at health facilities and 30% of all hospital admissions. The disease is endemic country-wide putting the entire population at risk of infection and exerting a greater toll in children under five and pregnant women. Malaria endemicity varies from hypo-endemicity, through meso-endemicity, hyper-endemicity to holo-endemicity. According to the Malaria Indicator Survey 2009, the parasite prevalence ranged from less than 1% in the mid northern area to more than 40% in the greater Equatoria region. The report further revealed that malaria prevalence was higher in rural areas than in urban areas and that pregnant women and children under five were more affected than other age groups. The HMIS data indicate a gradual increase in the number of cases and deaths due to malaria as reported by health facilities between 2008 and 2012.

Malaria Control in South Sudan

The MoH through the National Malaria Control Program (NMCP) is responsible for planning, coordinating, implementing and monitoring of malaria control interventions. While the NMCP in South Sudan is relatively young, the malaria control policy and strategic framework is well defined, with key WHO recommended interventions being scaled up and monitoring and evaluation systems established. A national strategic plan for malaria control was developed for the period of 2006–2013 with several malaria technical guidelines and tools to operationalize the plan. Malaria control is well articulated in the National Development Agenda, National Health Sector Strategic Plan (HSSP) and the 2012–2016 Health Sector Development Plan (HSDP). The HSSP prioritizes malaria control and prevention and endeavours to attain universal coverage with cost effective malaria interventions. Malaria is a key component of the basic package of health services and both curative and preventive interventions are delivered at all health system levels, including the community. The HSDP reflects the political will of the sovereign government of South Sudan to streamline and transform the weak health system, thus creating a platform for tailoring effective malaria control.

In 2009, the MoH/RSS and the RBM partners conducted the first nationally-representative Malaria Indicator Survey (MIS), measuring the coverage of the core RBM interventions and malaria-related disease burden. The survey was based on a standard set of instruments and protocol developed through the RBM-MERG. Further, the RBM-MERG recommends the Malaria Indicator Survey (MIS) to be conducted every 2 years within 6 weeks of the end of the rainy season in countries with endemic malaria transmission patterns, especially those in sub-Saharan Africa. In South Sudan, this corresponds to survey field work during the months of September-October.

The results of the survey provided a baseline of key malaria interventions, including prompt effective case management, possession and use of insecticide-treated mosquito nets (ITNs), availability of indoor residual spraying (IRS), and intermittent preventive treatment (IPT) for pregnant women. Further it reported on the national prevalence of malaria parasitemia (20->40%) and severe anemia (64%) among children less than 5 years of age. It was against this background that in order to evaluate the progress made against targeted core malaria control interventions as per the National Malaria Control Strategic Plan, South Sudan there was need to conduct the 2013 Malaria Indicator Survey.

1.3 OBJECTIVES OF THE 2013 MALARIA INDICATOR SURVEY

The 2006-2013 National Strategic Plan for Malaria Control in South Sudan aims to massively scale up malaria control interventions in the country. The 2013 South Sudan Malaria Indicator Survey (SSMIS) was, therefore, designed to measure progress toward achieving the goals and targets of this strategic plan by providing data on key malaria indicators, including ownership and use of bed nets, diagnosis and prompt treatment of malaria using artemisinin-based therapy (ACT), and behaviour change communication.

The following are the specific objectives of the 2013 SSMIS:

1. To assess the coverage of core malaria control interventions (Net ownership and Use, effective treatment of fever within 24 –hours of onset in children under 5 years , use of intermittent preventive treatment during pregnancy) targeted in the National Malaria Strategic Plan 2006 – 2013 as a follow-up from MIS , 2009.
2. To determine the prevalence of malaria parasites in children under 5 years and pregnant women.
3. To determine the prevalence of anemia in children under 5 years and pregnant women
4. To assess knowledge, attitudes, and practices regarding malaria in the general population

Secondary objective

- To strengthen the capacity of the National Malaria Control programme and partners for future implementation of the survey.

1.4 METHODOLOGY OF THE SOUTH SUDAN MIS

The 2013 South Sudan Malaria Indicator Survey (SSMIS) was implemented by the National Malaria Control Program with support from other Roll Back Malaria partners. It was carried out from October to November 2013 on a nationally representative sample of about 3,000 households. All women age 15-49 in the selected households were eligible for individual interviews. During the interviews, they were asked questions about malaria prevention during pregnancy and the treatment of fever among their children. In addition, the survey included testing for anaemia and malaria among children age 0-59 months using finger (or heel) prick blood samples and also tested pregnant women 15-49 years for anaemia and malaria.

Test results were available immediately and were provided to the pregnant women and to parents or guardians for children. Thick blood smears and thin blood films were also made in the field and transported to the Juba University Teaching Hospital. Microscopy was performed to determine the presence of malaria parasites and to identify the parasite species. As mentioned previously, the primary objectives of the 2013 SSMIS project are to provide information on malaria indicators and malaria prevalence, both for the nation and for each of the country's three regions.

1.4.1 Survey Organisation

The 2013 MIS was implemented by the **Ministry of Health, National Malaria Control Program (NMCP)** in collaboration with other stakeholders. A Technical Working Group (TWG) was set up comprising of stakeholders from **National Bureau of Statistics (NBS), Malaria Consortium, Population Services International (PSI), USAID (through Management Sciences for Health (MSH)), Interchurches Medical Assistants (IMA), WHO** and **UNICEF**. The MOH was responsible for general administrative management of the survey, including overseeing of day-to-day operations. The Ministry took primary responsibility for organizing the Technical Working Group and developing the survey protocol, participating along with NBS in recruiting, training, and monitoring field staff.

The **National Bureau of Statistics** assisted the MOH in the design of the MIS, especially in the area of sample design and selection. They provided technical input in the area of recruitment of field staff, data collection, survey methodology and design, sample size, questionnaire development, development of supervisors and interviewers manuals, and training of interviewers. The NBS also led the preparation of adequate enumeration area (EA) maps and state planning maps (soft and hard copies) that were used during the field work and also helps training in the taking of GPS coordinates.

Technical assistance was provided by **Management Sciences for Health, Malaria Consortium,** and **Population Services International.** Staff from these organizations assisted in several areas related to the survey.

Financial support for the survey was provided by **GFATM,** and **DFID** through **Population Services International (PSI).** USAID through MSH, **UNICEF** and **IMA** also contributed to the survey. **Other field support was provided by Malaria Consortium, BRAC, and IRC**

1.4.2 Sample Design

South Sudan is administratively divided into ten states and each state is in turn subdivided into counties. For statistical purposes each county is subdivided into Census Supervisory Areas (CSAs) and these are in turn subdivided into Standard Enumeration Areas (SEAs). The sample frame of this survey was the list of SEAs developed from the 2008 Population Census.

The sample for the 2013 SSMIS was designed to provide most of the key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of the three regions formed by grouping the 10 states that exist in South Sudan. The regions are as follows:

i. **Equatoria:** Eastern Equatoria, Western Equatoria and Central Equatoria

ii. **Bahr el Ghazal:** Western Bahr el Ghazal, Northern Bahr el Ghazal, Warrap and Lakes

iii. **Upper Nile:** Unity, Upper Nile and Jonglei

Table 1.1: Distribution of the South Sudan Population by region, Southern Sudan Population and Housing Census, 2008 and Population Projections for 2013

Region	Census Popn. 2008	Projected Popn. 2013
Upper Nile	2,908,765	3,830,457
Bahr el Ghazal	2,722,987	3,591,053
Equatoria	2,628,747	3,460,469
Total	**8,260,499**	**10,881,979**

The 2013 SSMIS sample was selected using a stratified, two-stage cluster design consisting of 150 clusters distributed equally in each of the three regions. A representative sample of approximately 3,000 households was selected for the survey, with a minimum target of 1000 completed individual women's interviews per region.

A complete listing of all households in the 150 selected clusters was carried out. This provided a sampling frame from which households were then selected for the survey. This was normally done by the survey team a day prior to actual interview. At the second stage, twenty households per EA were selected for interviewing from all households listed using equal probability simple random sampling. Every attempt was made to conduct interviews in the 20 selected households and up to 3 visits were made to ascertain compliance in case of absence of all (or any household members in the case of malaria parasite testing) to minimize potential bias.

All women aged 15-49 years who were either permanent residents of the households in the sample or visitors present in the household on the night before the survey were eligible to be interviewed along with the household head. In addition, all children aged 0-59 months who were listed in the household were eligible for the anemia and malaria testing component. Also women aged 15-49 years who were pregnant at the time of interview were tested for anemia and malaria.

1.4.3 Questionnaires

Two questionnaires were used in the SSMIS: a Household Questionnaire and a Woman's Questionnaire, which was administered to all women age 15-49 in the selected households. Both instruments were based on the standard Malaria Indicator Survey Questionnaires developed by The Roll Back Malaria and DHS programmes. These questionnaires were adapted to reflect the population and health issues relevant to South Sudan during a series of meetings convened with various stakeholders from the Ministry of Health and other government ministries and agencies, nongovernmental organisations, and international donors.

The **Household Questionnaire** was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, and relationship to the head of the household. The main purpose of the Household Questionnaire was to identify

women who were eligible for the individual interview and children age 0-59 months who were eligible for anaemia and malaria testing. The Household Questionnaire also collected information on characteristics of the household's dwelling unit, such as the source of water; type of toilet facilities; materials used for the floor, roof, and walls of the house; ownership of various durable goods; and ownership and use of mosquito nets. In addition, the questionnaire was used to record the results of the anaemia and malaria testing as well as the signatures of the interviewer and the respondent who gave consent.

The **Woman's Questionnaire** was used to collect information from all women age 15-49. These women were asked questions on the following main topics:

- Background characteristics (such as age, sex, residence, education, religion, and literacy)
- Birth history and childhood mortality
- Antenatal care and malaria prevention for most recent birth and pregnancy
- Malaria prevention and treatment
- Knowledge about malaria (symptoms, causes, prevention, and drugs used in treatment)

1.4.4 Anemia and Malaria testing

The 2013 MIS incorporated three "biomarkers," which were collected through finger (or heel) prick blood samples from children age 0-59 months to perform on-the-spot testing for (1) anemia, (2) malaria (by rapid diagnostic test), and (3) to prepare thick and thin blood smears to be read in the laboratory to determine malaria parasitemia. Each data collection team included two laboratory technicians who were responsible for carrying out the malaria and anemia testing and making the blood smear slides, as well as ensuring that medications for malaria were given in accordance with the appropriate treatment protocols. Informed consent for testing of children was requested from the child's parent or guardian at the end of the household interview.

Anemia testing: Because of the strong correlation between malaria infection and anemia, the MIS included anemia testing for children age 0-59 months and pregnant mothers. After obtaining informed consent from the child's parent or guardian and the pregnant mothers, blood samples were collected using a single-use, spring-loaded, sterile lancet to make a finger-prick. Laboratory technicians then collected a drop of blood on a microcuvette from the finger or heel prick. Hemoglobin analysis was carried out on site using a battery-operated portable HemoCue 301+ analyser which produces a result in less than one minute. Results were given to pregnant women and the child's parent or guardian verbally. Those whose children had a hemoglobin level of under 8 g/dl were given a referral card and urged to take the child to a health facility for follow-up care. Results of the anemia test for the children were recorded on the household questionnaire while the results of the women were recorded on the woman,s questionnaire.

Malaria testing using rapid diagnostic testing (RDT): Another major objective of the MIS was to provide information about the extent of malaria infection among children age 0-59 months and pregnant women. Using the same finger (or heel) prick for anaemia testing, a drop of blood was tested immediately using the rapid diagnostic test (RDT) "first response", which tests for Plasmodium falciparum. A tiny volume of blood is captured on the applicator and placed on the sample well of the device. Malaria RDTs have shown good sensitivity in a variety of field settings, and are increasingly advocated as a diagnostic test where reliable microscopy is not available. A potential problem for HRP2-based assays (RDT) is persistence of detectable circulating antigen for up to several weeks after parasites have been eradicated (Tjitra et al. 2001, Singh et al.2000 and Mayxay et al. 2001).

All field technicians were trained to perform the RDT according to manufacturers' instructions in the field. The technician read, interpreted and recorded RDT results after 15 minutes. They recorded the RDT results as either positive or negative, with faint test lines being considered as positive. Test results were provided to the child's parent/guardian and were recorded on the household questionnaire.

Children who tested positive for malaria using the rapid diagnostic test were offered a full course of treatment according to standard protocol for treating malaria in South Sudan.

Malaria testing using blood smears: In addition to the RDT, thick and thin blood smears were prepared in the field from each eligible child's and pregnant woman's blood. The slides were dried in a dust-free environment, stored in slide boxes and then transported to Juba Teaching Hospital for microscopy testing.

1.4.5 Fieldwork

Prior to the training in the states, a Training of Trainers (TOT) for the principal trainers was conducted. Participants comprised of people selected from the States. The States selected the personnel having been given the criteria to follow. The training of trainers was conducted in Juba and was coordinated by the National Malaria Control Program and National Bureau of Statistics. The participants of the TOT also carried out the pretest of the questionnaires.

After the TOT, 5 training venues were selected based on accessibility by the various teams from the different states. The trainers were then sent to these training centers to train the field workers with support from the central core team. These decentralised trainings took one week.

A total of 27 teams were trained for the survey, each team included a team supervisor, 2 interviewers and 2 data collectors forming at least two sub-teams of an interviewer and a blood collector in each main team. Immediately after the one week training, the teams were sent to the field to start on fieldwork.

1.4.6 Laboratory Microscopy

Blood slides were stained with Giemsa and read by a team of highly qualified senior laboratory technicians at Juba hospital. Based on standard laThe microscopists determined the presence and density (thick blood film) and species of the malaria parasites (thin blood film). If no asexual parasites or gametocytes were found after examination of 200 high power fields, the thick blood smear was considered negative and hence the corresponding thin was not read.

1.4.7 Data Processing

The processing of the MIS questionnaire data began over three months after the fieldwork. This was because of logistical problems. A local data processing consultant was hired to undertake the preparation of the data processing. Data processing staff were recruited and trained by NBS. Data were entered using the CSPro computer package. All data were entered twice (100 percent verification). Data cleaning was carried out by checking missing cases and inconsistent entries. A data analysis consultant was also hired to analyze the data and undertake report writing. The analysis was mainly based on descriptive statistics using standard tables.

1.5 RESPONSE RATES

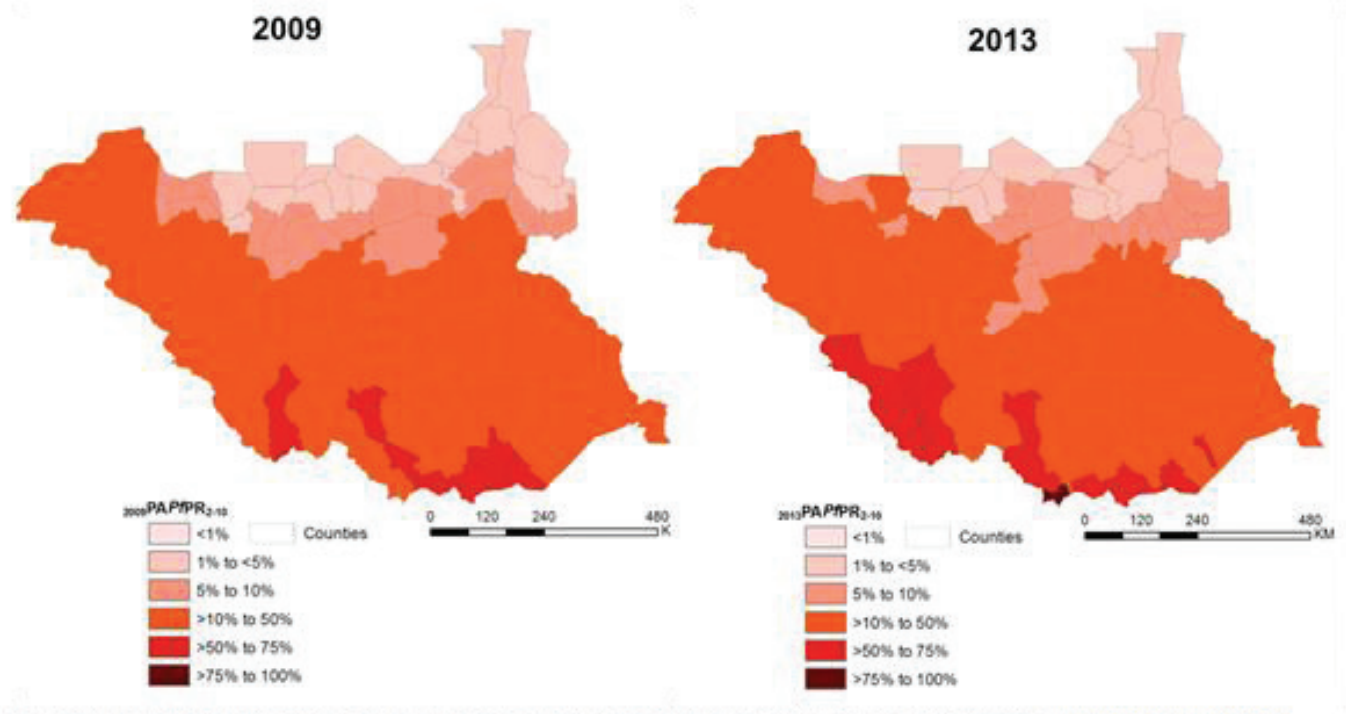
Table 1.2 shows response rates for the 2013 MIS. Of the 3,000 households expected to be interviewed from the selected sample, 2,897 were found at the time of the fieldwork. The shortfall is due to some enumeration areas which could not be done and a few households found to be vacant or destroyed. Of the existing households, 2,872 were successfully interviewed, yielding a household response rate of 98.7 percent.

In the households interviewed in the survey, a total of 3,836 eligible women were identified, of whom 3,254 were successfully interviewed yielding a response rate of 84.8 percent. The household response rate is almost the same in urban and rural areas (99 percent) but the women's response rates are slightly lower in the urban areas (79 percent) than in rural sample (86 percent).

Table 1.2: Results of Household and individual interviews
Number of households, number of interviews, and response rates, according to residence, South Sudan MIS 2013

Result	Rural	Urban	Total
Household Interviews			
Household occupied	2,418	479	2,897
Household interviewed	2,386	474	2,860
Household response rate[1]	98.7	99.0	98.7
Interviews with Women – 15-49 yrs			
Number of eligible women in households	3,078	758	3,836
Number of eligible women interviewed	2,652	602	3,254
Eligible women response rate[2]	86.2	79.4	84.8
1 **Household interviewed/Household occupied**			
2 **Women interviewed/Eligible Women**			

Malaria Prevalence Epidemiological Map



Developed by INFORM (Information for Malaria) project of the KEMRI Wellcome Trust Research Programme: www.inform-malaria.org

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

This chapter provides a descriptive summary of basic demographic and socioeconomic characteristics of the households and the women living within them who were interviewed in the 2013 South Sudan Malaria Indicator Survey (SSMIS). A household is defined by the survey as a person or a group of persons, related or unrelated, who live and eat from the same pot. The Household Questionnaire collects information on age, sex, and relationship to the head of the household for all usual residents and visitors who spent the night preceding the interview. This method of data collection allows analysis of the results for either the de jure or the de facto populations. The Household Questionnaire also obtains information on housing facilities, (e.g., source of water supply, sanitation facilities) and household possessions. Selected items are used to create an index of relative wealth for the household, which is described later in this chapter.

This chapter also profiles the women who live in the household and their basic characteristics, including age at the time of the survey, religion, residence, education, literacy, and wealth. The information presented in this chapter is intended to facilitate interpretation of the key demographic, socioeconomic, and health indicators presented later in the report. It is also intended to assist in the assessment of the representativeness of the survey sample.

Table 2.1: Household population by age, sex, and residence
Percent distribution of the de facto household population by five-year age groups, according to sex and residence, South Sudan MIS 2013

Age	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	21.1	20.0	20.6	22.3	19.3	20.7	22.1	19.5	20.7
5-9	18.2	15.4	16.8	22.2	19.7	20.9	21.4	19.0	20.2
10-14	13.1	15.1	14.1	15.0	14.8	14.9	14.6	14.8	14.8
15-19	11.5	9.4	10.4	8.7	7.1	7.9	9.2	7.5	8.3
20-24	7.2	9.0	8.1	4.2	6.3	5.3	4.9	6.8	5.9
25-29	6.9	8.9	7.9	4.3	7.4	5.9	4.8	7.6	6.3
30-34	5.2	5.8	5.5	4.5	5.6	5.1	4.6	5.7	5.1
35-39	4.1	4.7	4.4	4.6	5.0	4.8	4.5	5.5	4.7
40-44	3.8	3.4	3.6	3.5	2.2	2.8	3,6	2.4	3.0
45-49	3.5	2.0	2.7	3.4	1.8	2.6	3.4	1.8	2.6
50-54	1.9	2.8	2.4	1.8	5.0	3.5	1.8	4.6	3.3
55-59	1.0	1.3	1.2	1.6	1.8	1.7	1.4	1.7	1.6
60-64	1.0	0.8	0.9	1.7	2.1	1.9	1.6	1.9	1.7
65-69	0.9	0.2	0.5	1.0	0.9	0.9	1.0	0.8	0.9
70-74	0.4	0.8	0.6	0.7	0.6	0.6	0.6	0.6	0.6
75+	0.2	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.5
Total	**1,651**	**1,689**	**3,340**	**7,176**	**7,821**	**14,997**	**8,827**	**9,510**	**18,337**
Number	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

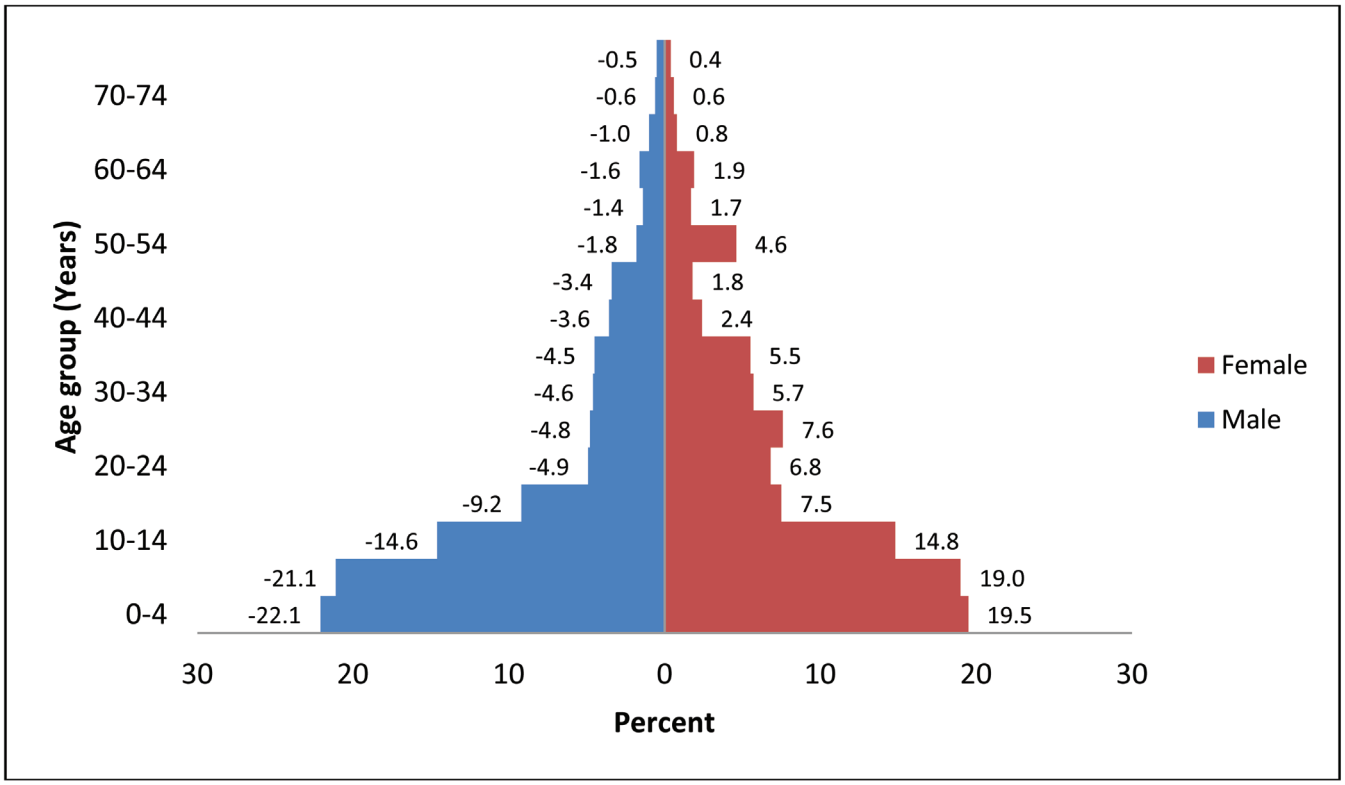
2.1 POPULATION BY AGE AND SEX

The distribution of the de facto household population in the 2013 SSMIS is shown in Table 2.1 by five-year age groups, according to sex and residence. Information was collected for more than 18,000 people in the selected households. Forty eight percent of the de facto population is male, and 52 percent is female. The sex ratio (the number of men per 100 women) is 93. The ratio in rural areas is slightly lower than that of urban areas (92 compared with 98). The results show that the household population has more young people than old people. Fifty-six percent of the total population is under age 15 while 2 percent is age 65 or older. The proportion of the population in each age group declines as age increases; the youngest age group (< 5

years old) has the largest proportion of the population (21 percent), and this percentage decreases steadily to reach less than 1 percent for the oldest age groups (75 years or older). The distribution by age groups is almost similar for females and males except for the age group 50-54.

Figure 2.1 illustrates the age structure of the household population in a population pyramid. One feature of population pyramids is their strength in illustrating whether a population is 'young' or 'old'. The broad base of the pyramid indicates that South Sudan's population is young. This scenario is typical of countries with high fertility rates. The figure shows some overreporting of women age 50-59 , presumably due to interviewers deliberately moving women from 49 to age 50 in order to reduce their workload.

Figure 2.1 Population Pyramid



2.2 HOUSEHOLD COMPOSITION

Information on key aspects of the composition of the households, including the household size, is presented in Table 2.2. These characteristics are important because they are associated with household welfare. The data show that the majority of households in South Sudan are headed by men (64 percent), but more than one third of the households (36 percent) are headed by females. The distribution of female-headed households is evenly distributed in both urban and rural areas.

Table 2.2: Household Composition

Percent distribution of households by sex of head of household and by household size; and mean size of household, South Sudan MIS, 2013

Characteristic	Residence		Total
	Urban	Rural	
Household headship			
Male	64.3	64.3	64.3
Female	35.7	35.7	35.7
Total	100.0	100.0	100.0
Number of usual members			
1	2.7	2.5	2.6
2	3.7	4.1	4.1
3	6.9	6.5	6.6
4	7.9	8.1	8.1
5	9.2	13.0	12.4
6	10.4	14.1	13.5
7	12.9	13.4	13.3
8	10.4	12.0	11.8
9	8.8	8.4	8.4
10	7.7	6.3	6.5
11	3.6	3.2	3.2
12+	15.6	8.4	9.6
Total	100.0	100.0	100.0
Mean size of households	7.2	6.4	6.5
Number of households	479	2,393	2,872

Note: Table is based on the de jure household members, i.e., usual residents.

Table 2.2 shows that the average household size is 6.6 persons. The average household size is lower in rural areas (6.5 persons) than in urban areas (7.2 persons). The proportion of households with twelve or more members is 10 percent, and this percentage is higher in urban areas (16 percent) than in rural areas (8 percent). Since the 2009 SSMIS, there has been an increase in the proportion with 12 or more members from 7 to 10 percent.

2.3 HOUSEHOLD ENVIRONMENT

The physical characteristics of the dwelling in which a household lives are important determinants of the health status of household members, especially children. They can also be indicators of the socioeconomic status of households. SSMIS household respondents were asked a number of questions about their household environment, including questions on the source of drinking water, type of toilet or latrine facility, type of cooking fuel, type of dwelling and floor materials. The results are presented for both household and de jure populations.

2.3.1 Drinking Water

One of the Millennium Development Goals (MDGs) that the Republic of South Sudan and other countries have adopted is to increase the percentage of the population with sustainable access to an improved water source in both urban and rural areas (United Nations General Assembly, 2001). Improved water sources include piped water; water from a public standpipe, tube well, or borehole; and water from a protected well or spring. Water that must be fetched from an improved source may be contaminated during transport or storage. Thus, a long distance to an improved source of water may limit the quantity of suitable drinking water available to a household.

Table 2.3: Household drinking water

Percent distribution of households and de jure population by source, time to collect, and person who usually collects drinking water; and percentage of households and de jure population by treatment of drinking water, according to residence, South Sudan MIS, 2013

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source						
Piped water into dwelling	2.1	1.7	1.8	2.7	2.1	2.2
Piped water into yard/compound	0.9	0.6	0.7	0.6	0.7	0.7
Public tap/standpipe	5.3	3.0	3.4	4.3	3.3	3.5
Borehole	47.2	54.9	53.7	42.5	54.4	52.2
Protected dug well	4.7	7.0	6.6	5.9	7.0	6.9
Protected spring	0.9	1.4	1.3	0.5	1.3	1.2
Rainwater	0.9	1.0	1.0	1.1	0.9	0.9
Total Improved Source	**62.0**	**69.6**	**68.5**	**57.6**	**69.7**	**67.6**
Non-improved source						
Unprotected dug well	0.4	9.1	7.6	0.5	9.6	7.9
Unprotected spring	0.2	2.4	2	0.2	2.4	2
Tanker truck/cart with drum	21.6	2.2	5.4	26.4	2.6	6.8
Surface water	11	15	14.4	10	14.7	13.3
1 Bottled water	2.8	0	0.5	2.9	0	0.5
Others	2.1	1.8	1.8	2.4	1.7	1.9
	38.1	**30.5**	**31.7**	**42.4**	**31**	**32.4**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	479	2,393	2,872	3,330	15,179	18,509

1 Because the quality of bottled water is not known, households using bottled water for drinking are classified as using an improved or non-improved source according to their water source for cooking and washing.

Table 2.3 shows the percent distribution of households and of population by the source of the household's drinking water. Sixty-nine percent of households in South Sudan have an improved source of drinking water, an increase from 65 percent reported in the 2009 SSMIS. Rural households (70 percent) are more likely than urban households (62 percent) to use an improved source of drinking water. The most common single source of drinking water is the tube well or borehole: 55 percent for rural households and 47 percent for urban households. Thirty-eight percent of urban households obtain drinking water from non-improved sources, with a sizeable proportion of 22 percent obtaining water from tanker truck or cart with a drum. On the other hand, 30 percent of rural households use an unimproved water source, with surface water being the most commonly used source (15 percent).

2.3.2 Household Sanitation Facilities

Increasing the percentage of the population with access to improved sanitation in both urban and rural areas is another indicator of the MDGs. Households without proper sanitation facilities have a higher risk of diseases such as dysentery, diarrhoea, and typhoid fever than do those with improved sanitation facilities. Improved sanitation technologies are defined as follows: connection to a public sewer, connection to a septic system, pour-flush latrine, simple pit latrine with a slab, or ventilated, improved pit latrine. According to the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation of 2005 (WHO/UNICEF, 2005), a household is classified as having an improved toilet if the toilet is used only by members of one household (i.e., it is not shared with other households) and if the facility used by the household separates the waste from human contact.

Table 2.4 presents data on the type of toilet facilities used by the household. Only 30 percent of household use some form of toilet with 15 percent using an improved toilet facility. Urban households are more likely to have an improved facility (40 percent) than rural households (11 percent).

Table 2.4: Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, South Sudan MIS, 2013

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Flush toilet	8.1	1.5	2.6	8.4	1.4	2.6
Pit latrine						
Private	31.6	9.1	12.8	36.0	9.3	14.1
Shared	19.9	10.6	12.1	20.4	11.2	12.8
Composting toilet	3.0	1.7	1.9	3.2	2.1	1.4
No facility/bush/field	37.3	76.2	69.8	31.8	75.2	67.4
Other	0.0	0.5	0.4	0.2	0.9	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	479	2,393	2,872	3,330	15,179	18,509

2.3.3 Housing Characteristics

Table 2.5 presents information on household characteristics such as electricity, flooring material, and use of various types of fuel for cooking. These characteristics reflect the household's socioeconomic situation and may influence environmental conditions that have a direct bearing on household members' health and welfare. In South Sudan, only 5 percent of households have electricity. The proportion of households with electricity is much higher in urban areas (20 percent) than in rural areas (2 percent). Earth or sand is the most common flooring material, used by 84 percent of all households. As expected, rural households are substantially more likely to have floors made of earth or sand (88 percent) than urban households (64 percent). Overall, only 3 percent of the households have floors made of cement. Use of cement floors is more common among households in urban areas than in rural areas (15 percent compared with 1percent).

Table 2.5: Housing characteristics

Percent distribution of households and de jure population by housing characteristics and percentage using solid fuel for cooking according to residence, South Sudan, MIS, 2013

Housing characteristic	Households				Population		
	Urban	Rural	Total		Urban	Rural	Total
Electricity							
Yes	19.5	2.4	5.3		13.0	1.0	3.2
No	80.5	97.6	94.7		87.0	99.0	96.8
Total	100.0	100.0	100.0		100.0	100.0	100.0
Flooring material							
Earth/sand	64.0	87.9	83.9		57.3	88.0	82.5
Dung	4.5	4.8	4.8		3.6	4.8	4.6
Wood planks	3.1	2.4	2.6		4.3	2.6	2.9
Palm/Bamboo	3.8	3.2	3.3		3.7	2,9	3.0
Parquet or polished wood	0.4	0.1	0.2		0.4	0.1	0.2
Vinyl or asphalt strips	0.0	0.0	0.0		0.0	0.0	0.0
Ceramic tiles	3.2	0.0	0.6		4.7	0.0	0.9
Cement	14.6	1.2	3.4		19.2	1.4	4.6
Carpet	2.5	0,2	0.6		3.2	0.1	0.7
Other	3.8	0.0	0.7		3.7	0.0	0.7
Total	100.0	100.0	100.0		100.0	100.0	100.0
Cooking fuel							
Electricity	0.2	0.1	0.1		0.2	0.1	0.1
LPG/natural gas/biogas	1.1	0.0	0.2		0.8	0.0	0.2
Kerosene	0.4	0.0	0.1		0.7	0.0	0.1
Charcoal	58.5	6.0	14.7		64.1	6.5	16.9
Firewood	36.7	89.9	81.0		31.7	89.0	78.7
Straw/grass	2.3	3.3	3.2		1.9	3.7	3.4
Dung	0.2	0.5	0.4		0.2	0.5	0.4
Other fuel	0.6	0.2	0.3		0.4	0.2	0.2
Total	100.0	100.0	100.0		100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	97.7	99.7	99.3		97.9	99.7	99.4
Number of households/population	479	2,393	2,872				
Total	100.0	100.0	100.0		3,330	15,179	18,509
					100.0	100.0	100.0

LPG = Liquid petroleum gas

[1] Includes charcoal, wood, straw/shrubs/grass, and animal dung

Table 2.5 further shows that wood is the fuel most commonly used for cooking, reported by 81 percent of households. Use of wood is about 2.5 times as common in rural areas (90 percent) as in urban areas (37 percent). Fifteen percent of all households interviewed use charcoal for cooking; 59 percent in urban areas compared with 6 percent in rural areas. Ninety-nine percent of all households use solid fuel for cooking.

2.4 HOUSEHOLD POSSESSIONS

The availability of durable consumer goods is a good indicator of a household's socioeconomic status. Moreover, particular goods have specific benefits. For instance, having access to a radio or a television exposes household members to innovative ideas; a refrigerator prolongs the wholesomeness of foods; and a means of transport allows greater access too many services away from the local area.

Table 2.6 shows by place of residence the percentages of households possessing or owning various household effects, means of transport, and animals. Overall, 22 percent of households own a radio. Households in urban areas are more likely than those in rural areas to own a radio (48 percent compared with 17 percent). Six percent of the households own a television; 24 percent in urban areas and 2 percent in rural areas. A mobile telephone is owned by 31 percent of households (60 percent in urban areas and 25 percent in rural areas). Finally, 2 percent of households have a refrigerator; 9 percent in urban areas compared with less than 1 percent in rural areas.

Table 2.6: Household possessions

Percentage of households and de jure population possessing various household effects, means of transportation, agricultural land and livestock/farm animals by residence, South Sudan, MIS, 2013

	Households			Population		
Possession	Urban	Rural	Total	Urban	Rural	Total
Household effects						
Radio	47.5	16.8	21.9	52.9	17.9	24.3
Television	24.2	1.8	5.5	32.4	2.0	7.5
Mobile telephone	60.2	25.2	31.0	67.9	28.9	35.9
Non-mobile telephone	7.8	1.7	2.7	10.1	1.9	3.4
Refrigerator	8.5	0.2	1.6	11.4	0.2	2.2
Satellite Dish	11.2	0.1	2.0	15.1	0.1	2.8
Air Conditioner/Cooler	2.8	0.0	0.5	3.5	0.1	0.7
Fan	11.7	0.1	2.0	13.3	0.2	2.5
Computer	8.9	0.5	1.9	10.4	0.5	2.3
Generator	14.8	0.3	2.7	18.9	0.5	3.8
Means of transport						
Bicycle	19.9	17.4	17.8	22.9	18.6	19.4
Animal drawn cart	1.7	0.3	0.5	1.5	0.5	0.7
Motorcycle/scooter	15.9	4.2	6.1	19.1	5.0	7.5
Car/truck	7.8	0.3	1.6	10.4	0.4	2.2
Boat	0.4	0.6	0.5	0.7	0.6	0.6
Ownership of animals[1]	35.8	70.0	64.0	40.3	74.0	67.9
Number	479	2,393	2,872	3,330	15,179	18,509

[1]Cows, goats, sheep or chickens and other poultry

Table 2.6 also shows the proportion of households owning various means of transport. Eighteen percent of the households (20 percent in urban and 18 percent in rural areas) own a bicycle; six percent (16 percent in urban areas and 4 percent in rural areas) own a motorcycle or scooter. Only 2 percent of all households own a car or truck (8 percent in urban areas and less than 1 percent in rural areas).

2.5 WEALTH INDEX

The wealth index is a background characteristic that is used throughout this report as an indicator of the economic status of households that is consistent with expenditure and income measures. It is calculated using data on the household's ownership of consumer goods, dwelling characteristics, source of drinking water,

sanitation facilities, and other characteristics that relate to a household's socioeconomic status. To construct the index, each of these assets is assigned a weight (factor score) generated through principal component analysis, and the resulting asset scores are standardised in relation to a standard normal distribution with a mean of zero and standard deviation of one (Gwatkin et al., 2000).

Each household is then assigned a score for each asset, and the scores are summed for each household. Individuals are ranked according to the total score of the household in which they reside. The sample is then divided into quintiles from one (lowest) to five (highest). A single asset index is developed on the basis of data from the entire country sample, and this index is used in all of the tabulations presented.

Table 2.7 shows the percent distribution of the de jure household population by wealth quintile according to residence and region. The distributions indicate the degree to which wealth is evenly (or unevenly) distributed geographically. The table shows that urban areas have higher proportions of people in the fourth and highest quintiles (18 and 62 percent, respectively) compared with rural areas (21 and 15 percent, respectively). On the other hand, rural areas have higher proportions of the population in the lowest and second quintiles (26 and 21 percent respectively) than urban areas (4 and 7 percent, respectively).

Table 2.7: Wealth quintiles

Percent distribution of the de jure population by wealth quintiles according to residence and region, South Sudan MIS, 2013

	Wealth quintile						Number of population
Residence/region	Lowest	Second	Middle	Fourth	Highest	Total	
Residence							
Urban	4.1	6.7	8.7	18.3	62.2	100.0	3,330
Rural	25.5	20.8	18.6	20.6	14.5	100.0	15,179
Region							
Upper Nile	18.6	20.6	23.4	22.4	15.0	100.0	5,939
Bahr el Ghazel	31.2	25.3	19.6	13.2	10.7	100.0	6,395
Equatorial	14.6	8.9	7.7	25.4	43.5	100.0	6,175
Total	20.0	20.0	20.0	20.0	20.0	100.0	18,509

Considering the three regions, Equatoria has 44 percent in the highest wealth quintile compared with Bahr el Ghazel with only 11 percent. Similarly, Bahr el Ghazel which is more rural than the rest has almost 40 percent in the second and lowest quintiles compared with Equatorial region which has 24 percent in the two lower quintiles. Upper Nile has most of the population concentrated in the middle and fourth quintiles.

2.6 CHARACTERISTICS OF WOMEN RESPONDENTS

The purpose of this section is to provide a demographic and socioeconomic profile of individual female respondents. This information is essential for interpretation of the findings presented later in the report and provides an indication of the representativeness of the survey.

2.6.1 General Characteristics

Table 2.8 presents the distribution of women age 15-49 by selected background characteristics. The proportion of women is 18 to 21 percent for the youngest age groups up to age 29, after which it declines as age increases; this reflects the comparatively young age structure of the population. The proportion of women age 15-49 living in rural areas is much higher (81 percent) than those living in urban areas (19 percent).

Table 2.8: Percent distribution of women ages 15–49 years by background characteristics, South Sudan MIS, 2013

Background characteristic	Percent	Number
Ages		
15–19	19.3	630
20–24	18.2	593
25–29	20.9	685
30–34	15.5	506
35–39	14.5	475
40–44	6.8	224
45–49	4.7	153
Total	100.0	3,266
Residence		
Rural	80.5	2,629
Urban	19.5	637
Total	100.0	3,266
Region		
Upper Nile	32.9	1,075
Bahr el Ghazel	31.6	1,031
Equatorial	35.5	1,160
Total	100.0	3,266
Education		
None	66.8	2,179
Primary	26.9	879
Secondary/University	6.3	208
Total	100.0	3,266
Literacy Status		
Literate	18.1	201
Illiterate	79.5	2986
No text to read	2.4	75
Blind	0.1	4
Total	100.0	3,266
Religion		
Christian	89.8	2,930
Muslim	2.0	66
Other	6.7	221
Not Stated/Missing	1.5	49
Total	100.0	3,266

By region, the distribution is almost even but Equatorial region has a slightly higher percentage of women (36 percent) compared with 32 percent in the Bahr el Ghazel Region and 33 percent in the Upper Nile Region. The overwhelming majority of South Sudanese women belong to the various denominations of Christianity (90 percent). Two percent are Muslim, 2 percent did not state their religion, and 7 percent report belonging to other religions.

Sixty-seven percent of women age 15-49 have never been to school. Twenty-seven percent have primary education and only 6 percent have secondary education and above. Eighteen percent of women aged 15-19 years from South Sudan are literate considering those who are able to read a whole or part of a sentence.

2.6.2 Educational Attainment of Women

Education is a key determinant of the lifestyle and status an individual enjoys in a society. Studies have consistently shown that educational attainment has a strong effect on health behaviours and attitudes. In general, the higher the level of education that a woman attains, the more knowledgeable she is about the use of health facilities and health care services for herself, her children, and her family. Table 2.9 presents general educational characteristics of women and shows the relationship between the respondent's level of education and other background characteristics.

Generally, younger women have attained more education and have reached higher levels of education than older women. For example, only 44 percent of women age 15-19 have never been to school compared with 88 percent of women age 44-49. In addition, younger women are much more likely than older women to have completed secondary school. For example, 10 percent of women age 20-24 have completed secondary school compared with less than 1 percent of women age 45-49.

Urban women are almost twice more likely to have attended school than rural women. Only 39 percent of urban women have never been to school compared with 74 percent of rural women. Urban women also stay in school longer, 23 percent of urban women have attended secondary or higher education compared with only 2 percent of rural women. The Bahr el Ghazel region has the highest percentage of women (81 percent) with no education while Equatorial region has the highest percentage (13 percent) of women with secondary education or higher.

Table 2.9 also shows that poorer women are less educated than richer women. Most women in the lowest wealth quintile have no education (89 percent), compared with 33 percent of women in the highest wealth quintile having no education. Less than 1 percent of women in the lowest wealth quintile have at least some secondary education, compared with 22 percent of women in the highest wealth quintile.

Table 2.9: Educational attainment

Percent distribution of women age 15-49 by highest level of schooling attended or completed, according to background characteristics, South Sudan MIS, 2013

Background characteristic	No schooling	Primary	Secondary & above	Number
Ages				
15-19	42.2	50.1	7.7	630
20-24	56.5	33.5	10.0	593
25-29	70.2	22.8	7.0	685
30-34	80.3	15.7	4.0	506
35-39	80.7	15.3	4.0	475
40-44	78.4	17.1	4.5	224
45-49	88.2	11.1	0.7	153
Residence				
Rural	73.7	24.0	2.3	2,629
Urban	38.5	38.6	22.9	637
Region				
Upper Nile	66.9	26.6	3.5	1,075
Bahr el Ghazel	81.0	17.5	1.5	1,031
Equatorial	51.3	35.4	13.2	1,160
Wealth Quintile				
Lowest	88.7	11.0	0.3	670
Second	83.4	16.1	0.5	604
Middle	75.2	23.3	1.5	564
Fourth	61.3	34.8	3.9	655
Highst	33.2	45.3	21.6	773
Total	66.8	26.9	6.3	3,266

ANTENATAL CARE, KNOWLEDGE OF MALARIA AND MANAGEMENT OF FEVER IN CHILDREN 3

3.1 ANTENATAL CARE

Monitoring of pregnant women through antenatal care visits helps reduce risks and complications during pregnancy and delivery. It is during an antenatal care visit that screening for complications and advice on a range of issues including place of delivery and referral of mothers with complications occur. In the 2013 SSMIS, interviewers recorded the source of antenatal care and the person who provided that care for women's most recent births. Information on antenatal care is of great value in identifying subgroups of women who do not utilize such services and is useful in planning improvements in the services.

Table 3.1: Antenatal Care

Percentage distribution of women age 15-49 who had a live birth in the five years preceding the survey by antenatal care (ANC) provider during pregnancy for the most recent birth and the percent receiving antenatal care from a skilled provider for the most recent birth, according to background characteristics South Sudan MIS, 2013

Background characteristic	Health Professional	Doctor	Mid-wife	Nurse	Community Health Worker	Traditional Birth Attendant	No one	Other	Number of Women
Residence									
Rural	57.3	7.6	41	8.7	6.3	6	29.5	0.7	1,544
Urban	82.5	17.6	57.6	7.3	0.5	2.4	13.7	0.8	348
Region									
Upper Nile	63.9	7.8	49.6	6.5	3.3	2.3	30.2	0.5	666
Bahr el Ghazel	56.6	7.3	40.3	8.9	5.2	11.7	25.8	0.7	674
Equatorial	65.3	12.9	42.3	10.1	7.2	2.3	24.2	1	704
Age									
15-19	65.8	11.8	46.1	7.9	6.6	6.6	19.1	2	152
20-24	65.6	10.8	46.7	8.1	5.9	4.3	23.5	0.7	443
25-29	62.3	9.9	44.4	8	4.9	5.3	26.5	0.9	547
30-34	58.1	7.8	41	9.3	4.3	5.5	31.9	0.3	398
35-39	62.7	8	43.9	10.1	4.5	7.7	24.9	0.9	337
40-44	62	8.4	43.9	8.4	6.5	3.7	29	0	107
45-49	48.1	7.4	37	3.7	11.1	0	40.7	0	54
Education									
No schooling	53.9	7.7	38.6	7.6	5.2	6	34.3	0.6	1,470
Primary	79	11	57.8	10.2	6.6	4.2	8.7	1.5	475
Sec & Above	91.1	25.3	57.6	8.2	1	1	1	0	99
Wealth index									
Poorest	45.5	9	28.6	7.9	4.8	6.9	42.9	0	434
Second	49.9	6.7	35.7	7.5	4.1	6.4	39.1	0.5	389
Middle	56	7	41.7	7.3	5.8	4.1	33.6	0.6	345
Fourth	69.7	8.3	53.4	8	7.8	6	15.8	0.7	436
Richest	85.9	15.2	59.1	11.6	3.9	3.4	5	1.8	440
Total	**61.9**	**9.4**	**44**	**8.5**	**5.3**	**5.4**	**26.7**	**0.7**	**2,044**

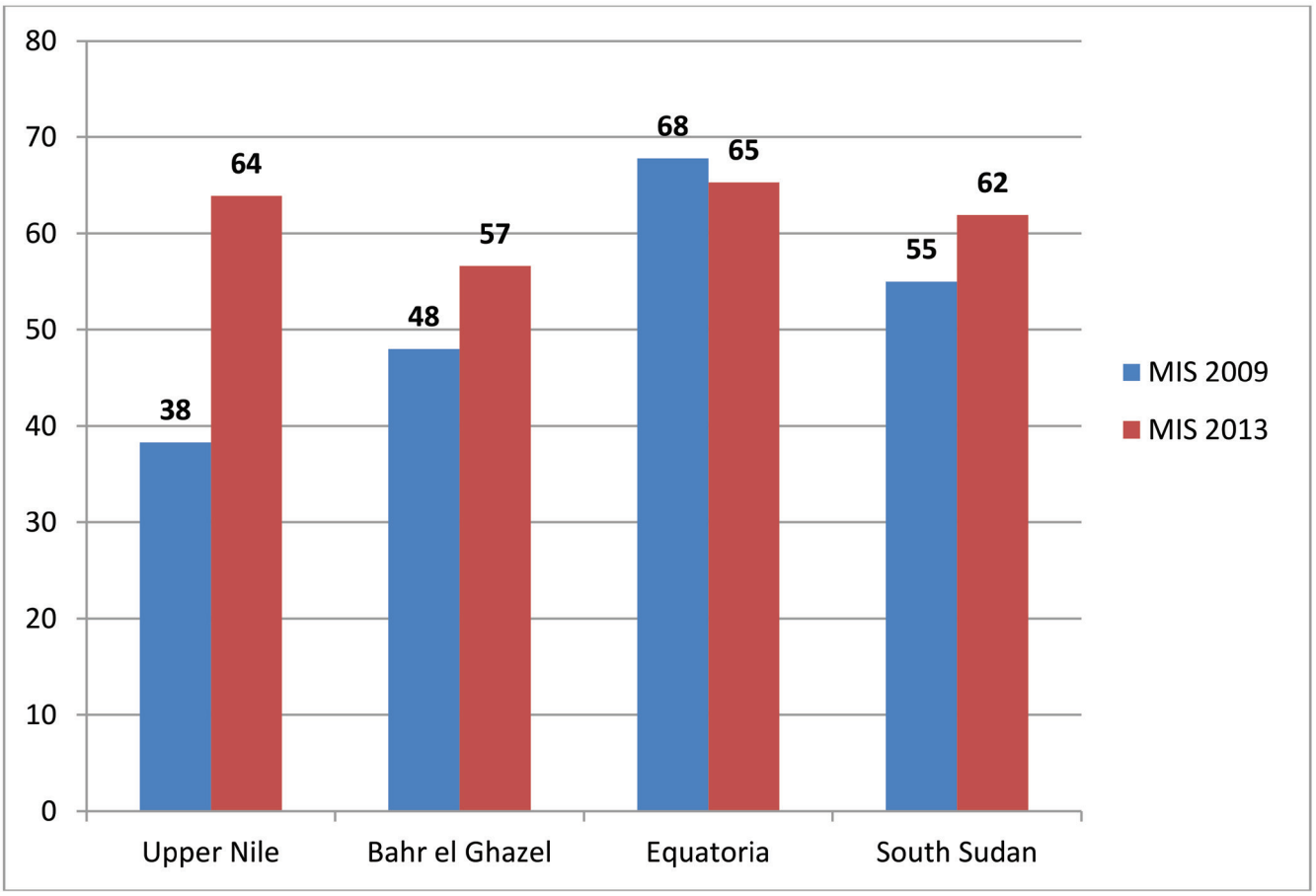
Table 3.1 presents the percent distribution of women age 15-49 who had a live birth in the five years preceding the survey by the type of antenatal care provider consulted during the pregnancy for the most recent birth. Over six in ten women (62 percent) received antenatal care from a skilled provider and 27

percent did not receive any antenatal care. Antenatal care is more prevalent in urban than rural areas; 83 percent of women in urban areas received antenatal care from a skilled provider compared with 57 percent of rural women.

Among regions, the percentage of women receiving antenatal care from a skilled provider ranges from 57 percent in the Upper Nile to 65 percent in the Equatorial region. Education and wealth are positively associated with an increase in the percent of women who received antenatal care from a skilled provider. For example, 54 percent of women with no education received antenatal care from a skilled provider contrasted with 91 percent of women with secondary education and above. Similarly, 46 percent of women in the lowest wealth quintile received antenatal care from a skilled provider contrasted with 86 percent of women in the highest wealth quintile.

The proportion of women receiving antenatal care from a skilled provider has slightly increased over the two survey periods. Figure 3.1 shows the trend of seeking antenatal care from a health professional for the entire country and the three regions. Seeking antenatal care from a skilled provider increased from 55 percent in 2009 MIS to 62 percent. The trend also shows an increase in Upper Nile and Bahr el Ghazel but the contrast is that seeking antenatal care from a skilled provider reduced from 68 percent to 65 percent in the Equatorial region.

Figure 3.1 Trend in seeking Antenatal Services from a Health Professional for



Women 15-49 Years, 2009-2013

3.2 WOMEN'S KNOWLEDGE OF MALARIA

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

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

3.2.1 Knowledge of Causes of Malaria

Lack of knowledge about how malaria is spread interferes with the ability to take appropriate preventive measures. Women were asked several questions to ascertain their knowledge of the causes of malaria. Table 3.2 presents information on responses provided by women age 15-49 when they were asked what causes malaria. Interviewers recorded and Table 3.2 presents, as many responses as women provided, in other words, a respondent may have mentioned more than one cause.

Sixty-one percent of women know that malaria is caused by mosquitoes, while 26 percent say malaria is caused by working in the sun, and 13 percent say malaria is caused by the drinking dirty water. Nine percent of women say that eating certain foods causes malaria, and 25 percent of women responded that they did not know what causes malaria.

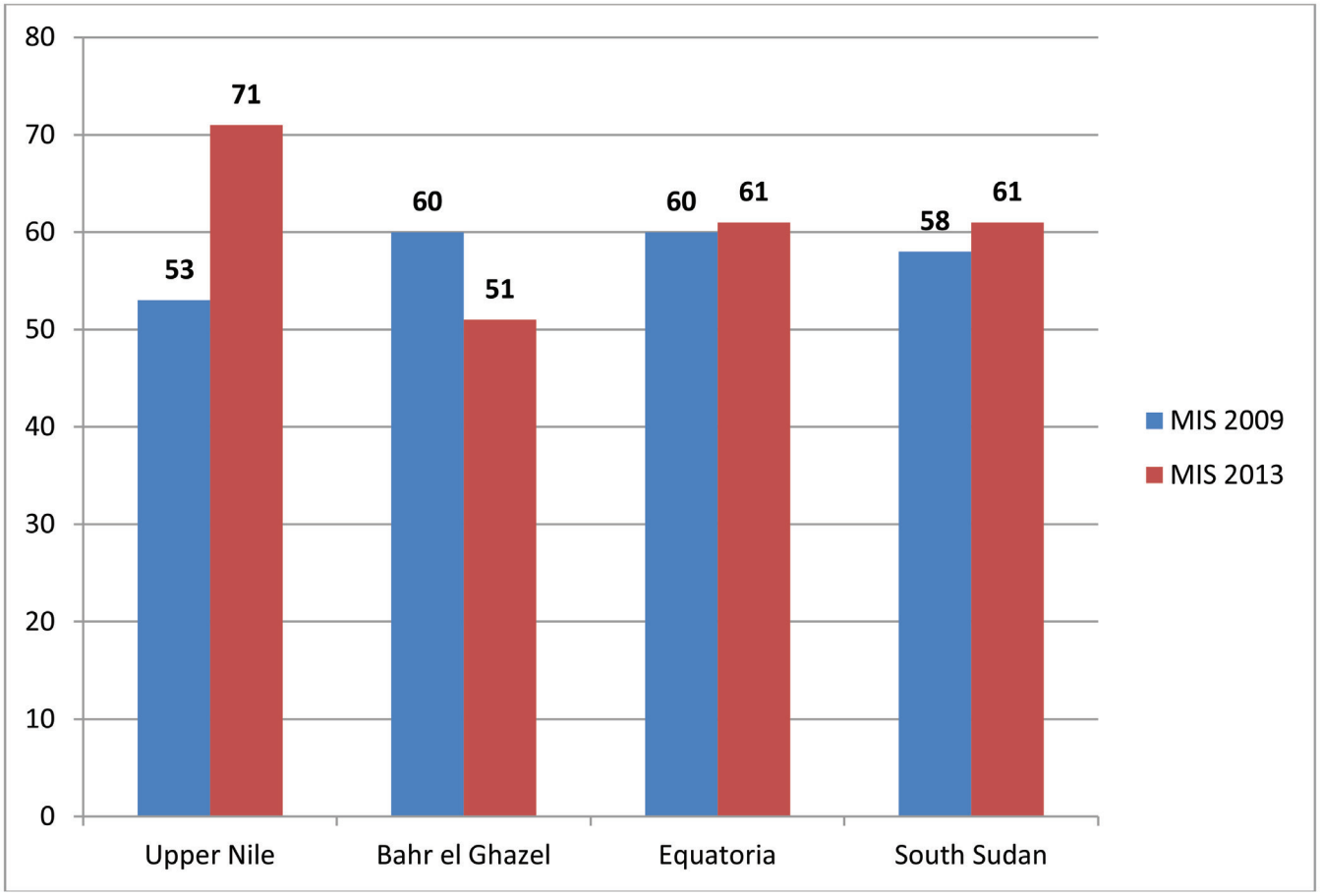
Considering age of the woman, no trend is studied as far as causes of malaria are concerned. Urban residents were more likely to know causes of malaria compared with rural women; for example 80 percent of urban women know that mosquitoes cause malaria compared with 56 percent women from rural areas. Regional distribution shows that women from Upper Nile have more knowledge of what causes malaria compared with those from other regions. Education and wealth are positively associated with an increase in the knowledge of the causes of malaria. For example only 51 percent of women with no education know that mosquitoes cause malaria contrasted with 92 percent of women with secondary education and above. Similarly, only 46 percent of the women in the lowest wealth know that mosquitoes cause malaria contrasted with 80 percent in the wealthiest quintile.

Table 3.2. Knowledge of causes of malaria

Among women age 15-49, the percentage who cite specific causes of malaria, by background characteristics South Sudan MIS, 2013

Background characteristic	Mosquitoes	Working in the sun	Drinking dirty water	Eating some foods	Staying out in the rain	From another person with malaria	Playing or bathing in rivers or ponds with snails	Don't know any	Number of Women
Age									
15-19	63.4	27.9	11.7	7.1	9.4	4.4	3.1	24.6	610
20-24	66.1	24.6	14.3	8.4	11.6	4.5	1.2	21.3	597
25-29	56.8	26.6	14.6	9.9	13.6	4.5	2.4	27.0	671
30-34	55.4	25.0	13.8	10.3	11.4	3.7	1.0	28.1	488
35-39	63.2	24.6	9.4	9.9	10.1	4.3	2.6	24.6	471
40-44	61.6	28.2	12.0	11.6	9.3	5.1	0.0	21.3	220
45-49	62.9	30.8	15.4	9.1	13.3	9.1	1.4	20.3	147
Residence									
Rural	55.5	28.4	11.8	8.7	11.9	3.5	1.9	28.0	2,519
Urban	80.3	17.5	17.2	11.0	8.8	8.6	1.9	12.1	685
Region									
Upper Nile	70.8	42.8	10.7	7.9	12.0	7.9	4.4	16.7	1,007
Bahr el Ghazel	50.8	28.2	16.1	17.0	14.1	2.3	1.1	29.7	981
Equatorial	60.6	10.4	12.3	3.9	8.1	3.5	0.6	27.1	1,216
Education									
No education	50.6	29.1	12.1	10.0	11.7	3.8	1.8	31.8	2,084
Primary	77.7	23.2	14.9	7.8	11.7	5.2	2.6	13.6	858
Sec & Above	92.2	9.5	14.3	6.9	5.6	8.7	0.9	2.6	231
DK/Missing	*	*	*	*	*	*	*	*	31
Wealth index									
Poorest	45.8	34.1	18.6	11.3	11.4	3.0	1.1	30.8	640
Second	45.6	25.8	11.1	9.9	13.0	3.9	1.0	35.4	585
Third	56.9	33.6	7.6	8.0	11.5	5.0	2.4	29.9	541
Fourth	67.6	28.5	10.3	9.0	13.1	4.5	3.9	18.4	624
Richest	80.4	13.0	15.5	7.9	8.1	6.0	1.5	13.3	814
Total	**60.8**	**26.1**	**13.0**	**9.1**	**11.2**	**4.6**	**1.9**	**24.6**	**3,204**

Figure 3.2 Percentage of Women 15-49 years who know that Mosquitoes Cause Malaria,



2009-2013 SSMIS

Figure 3.2 shows a comparison of women who know that mosquitoes cause malaria and those who do not know any specific cause of malaria over the two survey periods. There has been a slight increase in knowledge since 61 percent cite mosquitoes as a cause of malaria compared with 58 percent in the MIS 2009. By region, knowledge of women increased drastically in the Upper Nile region where 71 percent of the women know that mosquitoes cause malaria compared with 53 percent in the 2009 MIS while in Bahr el Ghazel knowledge decreased from 60 percent in the 2009 MIS to 51 percent for those women who know that mosquitoes cause malaria. Almost no change was recorded for residents of Equatorial region.

3.2.2 Knowledge of Ways to Avoid Malaria

Women were also asked during the survey if they know of ways to avoid getting malaria. Those who knew ways to avoid getting malaria were further asked to name specific ways. Table 3.3 shows responses provided by women age 15 to 49.

Sixty-four percent of women described ways to avoid getting malaria. The trend follows a similar pattern as for those who know the causes of malaria. Urban women were more likely to know any preventative way (83 percent) than rural women (59 percent). Young women (15.24) and old women (40-49) were more likely to know ways to avoid malaria than women in the middle age-groups. Greater variation is observed among regions—from 53 percent of women in Bahr el Ghazel reporting that they know ways to avoid malaria to 73 percent of women in Upper Nile. Women with no education are least likely to report that there are ways to avoid malaria compared with women who have primary education or else a secondary or higher education.

When asked to cite specific ways to avoid getting malaria, only 37 percent of women say sleeping under a mosquito net, while other responses include sleeping under an ITN (34 percent), taking preventive medication (10 percent), using insecticide spray (6 percent), keeping the windows closed (4 percent), eliminating stagnant water around living areas (7 percent). The percentage of women who mention sleeping under a mosquito net as a way to avoid malaria varies greatly among regions, the percentage of women who know that sleeping under

Table 3.3. Knowledge of ways to avoid malaria

Among women age 15-49, the percentage who cite specific ways to avoid malaria, by background characteristics South Sudan MIS, 2013

Background characteristic	Any preventative way	Sleeping under a bednet	Sleeping under an insect treated net	Taking preventative medication	Spraying walls of a house with insectcide	Keeping the windows closed	Draining/ Treating stagnant water	Avoiding contact with people with malaria	Avoiding staying too long in the sun	Don't know any	Number of Women
Age											
15-19	67.7	35.6	38.9	12.2	8.4	4.0	6.3	3.3	7,1	27.1	610
20-24	68.5	41.3	34.7	7.6	6.8	6.2	8.6	4.5	9.8	25.3	597
25-29	61.6	38.3	29.6	9.2	7.1	3.8	7.2	4.0	10.7	27.3	671
30-34	58.7	37.3	33.1	8.3	7.2	2.5	4.8	2.9	8.7	32.2	488
35-39	63.2	30.8	33.6	10.5	3.9	5.8	7.5	3.6	8.9	26.3	471
40-44	69.9	41.2	31.5	9.3	3.7	3.7	8.8	2.3	8.8	22.2	220
45-49	67.8	36.4	42.0	11.2	4.2	4.9	9.1	4.2	12.6	21.7	147
Residence											
Rural	59.3	35.0	31.5	8.1	5.7	3.8	5.0	3.7	9.6	31.3	2,519
Urban	83.2	44.7	42.5	14.9	9.1	6.6	15.0	3.2	7.6	11.0	685
Region											
Upper Nile	73.4	49.4	46.9	7.0	9.4	6.9	8.5	9.2	11.6	18.0	1,007
Bahr el Ghazel	52.8	24.7	29.5	10.2	7.9	2.9	4.8	1.9	12.3	36.9	981
Equatorial	66.1	36.9	26.6	11.3	2.6	3.5	7.8	0.3	4.6	26.3	1,216
Education											
No education	54.4	31.3	29.8	8.4	5.7	4.1	5.1	4.3	10.6	34.8	2,084
Primary	80.5	44.6	43.1	9.6	6.3	4.8	9.7	3.0	7.0	14.7	858
Sec & Above	97.0	63.2	37.7	20.4	13.4	5.6	16.5	0.4	4.8	3.5	231
DK/Missing	*	*	*	*	*	*	*	*	*	*	31
Wealth index											
Poorest	51.9	24.2	29.5	12.0	7.2	3.1	4.1	2.8	13.8	34.1	640
Second	45.6	26.2	27.7	7.5	5.0	2.6	3.9	5.3	9.6	42.6	585
Third	60.4	38.1	33.6	7.2	6.7	4.6	5.7	6.5	9.6	34.2	541
Fourth	73.2	44.4	38.6	7.1	7.0	7.2	5.9	3.9	9.0	18.9	624
Richest	83.4	48.8	38.2	12.7	6.1	4.3	13.6	1.0	5.1	11.4	814
Total	**64.4**	**37.1**	**33.9**	**9.6**	**6.4**	**4.4**	**7.1**	**3.6**	**9.2**	**26.9**	**3,204**

a mosquito net helps avoid malaria in Upper Nile is almost twice those from Bahr el Ghazel (49 and 25 percent respectively).

3.2.3 Knowledge of Malaria Treatment

In the 2013 MIS, women were asked to cite specific drugs that are used to treat malaria if a member of the family got the disease. Table 3.4 presents information on women's knowledge of malaria treatment. Among all women, only 41 percent know the right medicine that can be used to treat malaria, this has not changed from the percentage that reported the right medicine in the 2009 MIS. Twenty-three percent report that AS+AQ can be used to treat malaria an improvement from 14 percent who reported the drug in the 2009 MIS. Also 14 percent reported coartem also registering an increase from 9 percent.

Women from Equatorial and Upper Nile regions are more likely to know the right medicine for treating malaria than those from Bahr el Ghazel. The results further show that knowledge of the right medicine for malaria increases with education and wealth. For example on 31 percent of women with no education know the right medicine to treat malaria contrasted with 71 percent for women with secondary education and above.

Other answers regarding malaria medicines include Quinine (16 percent), Artemether (14 percent), Chloroquine (9 percent) and SP/Fansidar (5 percent). There is a sizeable proportion of women (20 percent) who reported that Panadol can be used to treat malaria while 36 percent of women do not know of any specific medicine.

Table 3.4. Knowledge of right medicine to take when one gets malaria

Among women age 15-49, the percentage who cite specific medicine to take when on gets malaria, by background characteristics South Sudan MIS, 2013

Background characteristic	Know right medicine for treatment	AS+AQ	Coartem	Artesunate + SP	Quinine	Artemether	Chloroquine	SP Fansidar	Panadol	Don't know any	Number of Women
Age											
15-19	41.6	24.9	14.0	6.3	14.4	19.5	7.1	6.7	22.9	34.5	610
20-24	43.0	22.8	14.2	5.2	15.7	16.2	11.5	6.4	20.4	34.9	597
25-29	38.1	22.4	13.7	5.7	14.1	24.0	9.0	4.8	20.4	35.1	671
30-34	38.8	20.7	13.2	4.6	18.0	14.6	9.1	6.2	19.4	39.1	488
35-39	43.0	25.1	13.3	5.6	16.7	13.1	7.7	4.3	17.8	36.8	471
40-44	47.8	19.0	20.8	8.8	18.5	8.6	6.0	3.2	18.5	34.3	220
45-49	42.7	25.2	10.5	6.3	18.2	4.1	14.7	2.8	19.6	37.1	147
Residence											
Rural	37.1	22.4	11.4	5.5	13.4	10.7	8.9	5.0	21.2	41.2	2,519
Urban	56.1	24.8	23.7	6.6	23.9	35.5	9.2	6.7	16.1	17.8	685
Region											
Upper Nile	44.6	29.0	18.8	8.6	13.1	23.9	12.6	8.4	25.3	26.6	1,007
Bahr el Ghazel	26.9	19.4	4.8	1.4	11.5	7.4	9.4	4.2	18.8	54.8	981
Equatorial	49.8	20.6	17.4	1.5	21.5	16.4	5.5	3.9	16.7	29.0	1,216
Education											
No education	31.1	19.5	9.1	4.7	11.2	11.1	9.3	4.9	19.8	46.5	2,084
Primary	58.0	30.5	19.0	7.8	24.1	21.5	9.6	5.9	23.8	19.9	858
Sec & Above	70.6	26.8	40.7	7.8	26.0	42.0	4.3	7.8	10.0	4.8	231
DK/Missing	*	*	*	*	*	*	*	*	*	*	31
Wealth index											
Poorest	27.5	18.5	6.9	2.2	11.3	6.9	9.8	3.9	23.3	46.6	640
Second	24.4	16.6	4.6	3.1	7.4	7.0	8.9	5.5	14.4	55.7	585
Third	32.7	20.7	13.5	8.0	11.1	15.2	10.9	7.4	18.3	44.4	541
Fourth	51.0	27.6	18.0	9.5	18.1	18.1	8.5	5.0	25.3	26.4	624
Richest	61.9	28.6	23.6	6.1	26.8	28.6	7.3	5.5	18.9	16.0	814
Total	**41.1**	**22.9**	**14.0**	**3.7**	**15.8**	**14.0**	**8.9**	**5.4**	**20.1**	**36.2**	**3,204**

3.3 PREVALENCE, DIAGNOSIS, AND PROMPT TREATMENT OF CHILDREN WITH FEVER

Malaria case management, including the identification, diagnosis, and rapid treatment of all malaria cases with appropriate and effective antimalarial drugs, is one of the key strategic goals for malaria control in South Sudan. Fever is a major manifestation of malaria and other acute infections in children. Most malarial fevers occur at home, and prompt and effective treatment is critical to prevent morbidity and mortality related to malaria. The 2013 SSMIS asked mothers whether their children under age 5 had had a fever in the two weeks preceding the survey and, if so, whether any treatment was sought. Questions were also asked about blood testing, the types of drugs given to the child, and how soon and for how long the drugs were taken.

Table 3.5 shows the percentage of children under age 5 who had fever in the two weeks preceding the survey and, among those children under age 5 with fever, the percentage for whom advice or treatment was sought from a health facility or provider, the percentage of such children who had a drop of blood taken from a finger- or heel-prick (presumably for a malaria test), the percentage who took ACT or any antimalarial drugs, and the percentage who took drugs on the same or next day.

Table 3.5 shows that 45 percent of children under age 5 had fever during the two weeks preceding the survey reflecting an increase from 35 percent reported in the 2009 SSMIS. A higher proportion of urban children (49 percent) than rural children (44 percent) reported having fever. The prevalence of fever was highest among those age 12-35 months. Children from the Upper Nile Region have a lower prevalence (34 percent) compared with those from Equatorial Region (63 percent). Children whose mothers had no education were less likely to have fever than those whose mothers had at least primary or secondary and above education. Similarly, children in the highest wealth quintile were more likely to have experienced fever (53 percent) than those in other wealth quintiles (46 percent or lower).

Among children with fever, 57 percent were taken to a health facility or provider for advice or treatment. This is also an improvement from 52 percent who sought advice from a health facility or provider in the 2009 SSMIS. Children's age did not seem to play part in treatment seeking behaviour as almost an equal proportion of younger children less than 12 months sought advice as the older ones (48-59 months). Urban children (60 percent) are more likely than rural children (56 percent) to have been taken to a health facility or provider pharmacy for advice or treatment.

The proportion of children who were taken for treatment is higher in the Upper Nile Region than in other regions (61 percent compared with 50 and 58 percent). Care seeking for children with fever generally increases with the mother's education and wealth quintile. For example, treatment for fever was sought for 71 percent of children whose mothers have had at least a secondary education and 67 percent of children in the highest wealth quintile compared with 53 percent of children whose mothers have had no education and 49 percent of children in the lowest quintile.

Figure 3.3 shows the trend of seeking advice/treatment from a health provider for children who reported having a fever in 30 days preceding the survey. The results show that there has been a positive trend in health seeking behavior in South Sudan from 52 percent in 2009 to 57 percent in the 2013 MIS. There has been a considerable increase in Upper Nile region from 39 percent in 2009 to 61 percent. Similarly, for the Bahr el Ghazel region a notable increase was registered from 37 percent in 2009 to 50 percent, however, for the Equatorial region, there was a decline from 65 percent to 58 percent for those seeking advice from a health provider when with fever.

Figure 3.3 Trend is Seeking Advice from a Health Provider for Children under 5 with a Fever

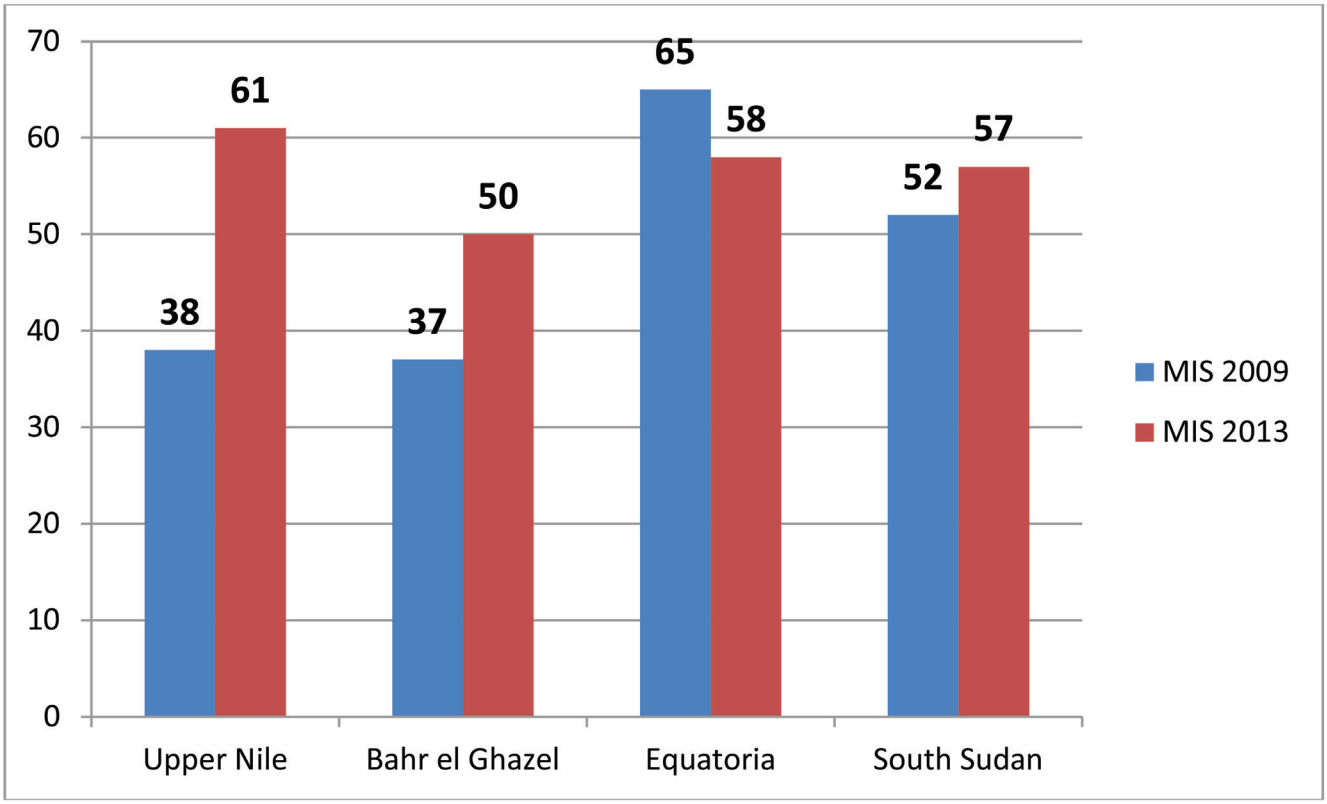


Table 3.5: Prevalence and prompt treatment of children with fever

Percentage of children under age five with fever in the two weeks preceding the survey, and among children with fever, the percentage for whom advice or treatment was sought from a health facility or provider, the percentage who had blood taken from finger or heel for testing, the percentage who took antimalarial drugs and the percentage who took the antimalarial drugs the same or next day following the onset of fever, by background characteristics, by background characteristics South Sudan MIS, 2013

	Among children under age 5:				Among children age 5 with fever			
Background characteristic	Percent with fever in the two weeks preceding the survey	Number of Children	Percentage for whom advice was sought from Health facility or provider	Percentage who reported having blood taken from finger or heel for testing	Percentage who took any drugs	Percentage who took antimalarial drugs	Percentage who took antimalarial drugs same or next day	Number of children with fever
Age of child								
0-11 months	45.1	668	60.6	21.6	54.4	26.6	13.7	294
12-23 months	52.2	637	59.9	29.4	56.1	33.6	18.3	315
24-35 months	49.5	738	55.2	26.1	49.8	31.8	18.1	353
35-47 months	42.0	733	57.8	31.9	54.6	32.3	16.7	305
48-49 months	42.1	653	59.6	33.5	61.5	43.1	20.2	272
Residence								
Rural	44.0	2,780	55.9	23.9	51.6	31.0	16.0	1,223
Urban	48.7	649	60.1	41.8	62.3	35.4	22.1	316
Region								
Upper Nile	33.8	1,048	60.7	31.3	55.6	29.3	10.5	354
Bahr el Ghazel	35.7	1,139	50.4	15.0	40.1	18.9	10.6	407
Equatorial	62.6	1,242	58.4	32.4	61.0	39.8	23.9	778
Education								
No education	42.7	2,466	53.1	21.3	47.9	27.1	14.6	1,053
Primary	49.9	797	62.9	37.4	64.2	41.2	22.9	397
Sec & Above	54.5	156	70.6	54.1	75.0	44.7	23.5	89
Wealth index								
Poorest	46.1	696	48.9	16.2	47.3	20.3	14.6	321
Second	35.7	684	52.1	13.1	46.8	23.4	10.7	244
Third	36.2	577	53.1	23.9	45.1	26.8	14.3	209
Fourth	51.2	726	57.8	31.2	53.1	34.7	17.7	372
Richest	52.7	746	67.2	44.3	68.6	46.8	24.7	393
Total	**44.9**	**3429**	**56.8**	**27.6**	**53.7**	**31.9**	**17.2**	**1,539**

In the 2013 SSMIS, mothers were asked whether children under age 5 with fever had blood taken from a finger or heel for testing, presumably for diagnostic purposes. It should be noted that the question did not ask which test was conducted. Although the blood could have been taken for malaria testing, it could also have been taken for anaemia or other tests. The mother may or may not have known the reason for which blood was taken from her child. Overall, 28 percent of children with fever had a heel or finger prick which shows almost no change from the 2009 SSMIS (27 percent). The percentage varies by subgroup of children and follows a pattern similar to that observed among differentials of children taken for advice or treatment except by age of child and region; it is highest among older children age 48-59 months, it is higher for children in urban areas than in rural areas, and highest for children in the Equatorial Region compared with other regions.

The likelihood that a child had blood taken increases with both mother's education and wealth quintile. For example, the proportion of children who had blood taken from a finger or heel for testing increases from 21 percent for children whose mother have no education to 37 percent of children whose mothers have a primary education to 54 percent for children whose mothers attended secondary school and above.

Table 3.5 also presents the percentage of children with fever that received prompt treatment. Overall, 32 percent took antimalarial drugs showing a decrease from 36 percent reported in the 2009 SSMIS. In South Sudan, 17 percent took the antimalarial drug same day or next day showing an improvement from only 11 percent reported in the 2009 SSMIS. By age, children 48-59 months are more likely than others to have taken an antimalarial drug and also to have taken it same or next day of fever onset. Children in the urban areas (35 percent) are more likely than children in the rural areas (31 percent) to take an antimalarial drug. Among the regions, children living in the Equatorial Region (40 percent) two times more likely to have taken an antimalarial drug compared with children in the Bahr el Ghazel Region (19 percent). The proportion of children that took an ACT increases with increased education of mothers and wealth quintile.

Variation by background characteristics among the percentage of children that took an ACT the same or next day are almost similar to the differentials observed for children that took an ACT. There is a notable difference by residence in the proportion of children who took an ACT within the same or next day after onset of fever (22 percent in urban areas and 16 percent in rural areas). The percentage of children with fever treated with ACT has a positive relationship with the mother's education; it is lowest for children with an uneducated mother (27 percent) and increases with the mother's education to 44 percent for children of mothers who have secondary education.

3.4 PLACE OF TREATMENT

The results of the survey show that of children under five with fever who were taken for treatment, 74 per cent were taken to government facilities and 26 per cent to private facilities. Those living in rural areas (88 per cent) were more likely to seek treatment from government facilities than those in urban areas (56 percent). There was a decline in the use of private health facilities for rural children from 27 percent in the 2009 SSMIS to 21 percent and an increase in use of private facilities for urban from 36 percent in 2009 SSMIS to 43 percent.

Table 3.6: Among children under age 5 with fever in the two weeks preceding the survey for whom treatment was sought, percent distribution by source of treatment by background characteristics, South Sudan MIS 2013

Background Characteristic	Public Sector					Private Sector						Number of children with fever for whom treatment was sought
	Government Hospital	Government Health Centre	Government Health Unit	Mobile Clinic	Community Health Worker	Private Hosp/ Clinic	Pharmacy	Private Doctor	Mobile Clinic	Shop	Traditional practitioner	
Residence												
Rural	19.9	28.2	25.5	3.2	2.1	7.2	6.1	1.7	0.4	2.1	3.9	727
Urban	30.7	18.5	3.9	4.4	0.0	13.7	17.6	3.4	0.5	5.9	1.5	205
Region												
Upper Nile	24.5	39.4	20.8	1.9	1.4	3.2	2.3	6.0	0.0	0.5	0.0	216
Bahr el Ghazel	19.8	21.6	15.3	3.2	0.9	13.1	16.2	1.8	0.5	4.1	3.6	222
Equatoria	22.5	22.3	23.1	4.3	2.0	8.9	7.9	0.4	0.6	3.4	4.6	494
Mother's Education												
No Education	27.9	28.1	25.4	3.4	1.7	6.9	5.6	2.4	0.0	2.0	4.0	597
Primary	25.0	23.9	13.4	3.4	1.9	9.7	11.9	1.9	1.1	5.2	2.6	271
Sec and Above	27.9	16.4	8.2	4.9	0.0	19.7	19.7	0.0	1.6	1.6	0.0	64
Wealth Quintile												
Lowest	20.6	19.4	34.1	1.8	2.4	7.7	4.7	1.2	0.6	0.0	7.6	170
Second	23.5	30.3	22.0	0.8	1.5	6.8	8.3	2.3	0.8	1.5	2.3	132
Middle	34.8	25.0	27.9	2.7	1.8	4.5	2.7	0.0	0.0	0.0	0.9	112
Fourth	17.7	35.4	16.9	5.6	1.7	3.4	2.5	4.2	0.4	5.9	3.4	237
Highest	21.7	20.6	12.5	4.3	1.1	16.0	16.0	1.4	0.4	3.9	2.1	281
Total	**22.3**	**26.1**	**20.7**	**3.4**	**1.6**	**8.6**	**8.6**	**2.0**	**0.4**	**2.9**	**3.3**	**932**

3.5 MALARIA CASE MANAGEMENT AMONG CHILDREN

Malaria case management is a key intervention of the Strategic Plan 2007-2013 and is being delivered through a mixed approach in South Sudan, including facility and community based case management. To ensure effective treatment of malaria, the Republic of South Sudan has updated the national treatment policy to include Artemisinin based Combination Therapies (ACTs), highly efficacious medicines for the treatment of uncomplicated malaria. These services are offered through the Primary Health Care Units, Primary Health Care Centres and Hospitals operated by the ministry of health and INGOs. Services are also being accessed at the private health facilities or drugs being purchased over the counter.

Among other things, prompt and effective malaria treatment requires that patients seek treatment early; correct medicines are readily available and accessible; and the health workers are adequately trained to recognize and treat patients with malaria and its complications. Diagnosis of malaria is based on clinical suspicion (clinical diagnosis) and on confirmation through detection of parasites (microscopy) or specific antigens/proteins from malaria parasites (Rapid Diagnostic Tests) in blood.

Details on the types of antimalarial drugs given to children to treat fever are presented in Table 3.7. When interpreting the results, it is important to remember that the information is based on reports from the mothers of the ill children, many of whom may not have known the specific drug given to the child.

As shown in Table 3.7, 15 percent took AS+AQ a percentage similar to what was reported in the 2009 SSMIS. Five percent were given coartem, 5 percent quinine, 11 percent were Panadol and 2 percent were given SP/Fansidar. These findings show little change since 2009.

Table 3.7 also presents the percentage of children with fever that received treatment using ACTs.

Overall, 2 in 10 children (20 percent) with fever took artemisinin-based combination therapies (ACTs), the recommended treatment for malaria in South Sudan. In South Sudan, the most common ACT is artesunate+amodiaquine which is the first line of treatment once diagnosed with fever. By age, older children 48-59 months are more likely than others to have taken an ACT. Children in the rural areas (21 percent) are more likely than children in the urban areas (17 percent) to take an ACT.

Among the regions, children living in the Equatorial region (24 percent) are more likely to have taken an ACT compared with children in the Upper Nile (23 percent) or Bahr el Ghazel (13 percent). The proportion of children that took an ACT is higher for those with primary and secondary education than for those with no education. ACT use increases with wealth quintile up to the fourth quintile but is slightly lower in the highest quintile than in the fourth.

Table 3.7: Type of antimalarial drugs

Among children under age 5 with fever in the two weeks preceding the survey, percentage who took specific antimalarial drugs after developing the fever, by background characteristics, South Sudan MIS 2013

Background characteristic	ACTs	AS+AQ	Coartem	Artesunate + SP	Quinine	Artemether	Chloroquine	SP Fansidar	Panadol	Number of Children with fever
Age of Child										
0-11 months	13.4	10.4	2.9	0.8	5.4	2.9	1.2	1.7	17.8	294
12-23 months	21.8	14.9	5.7	1.2	5.0	3.8	0.4	1.9	13.0	315
24-35 months	16.4	12.7	2.0	0.7	8.4	5.4	0.0	2.3	10.7	353
35-47 months	21.1	13.6	7.1	0.4	4.4	4.0	0.8	1.2	9.2	305
48-59 months	35.0	27.2	7.8	0.0	4.6	1.8	0.0	0.9	8.3	272
Residence										
Rural	21.4	16.2	4.7	0.8	4.1	2.8	0.4	2.0	10.1	1,223
Urban	17.1	11.1	6.0	1.0	8.9	5.3	1.6	0.6	14.9	316
Region										
Upper Nile	22.5	15.8	5.6	1.1	1.1	3.1	0.3	1.1	11.0	354
Bahr el Ghazel	12.6	11.3	0.3	1.0	2.0	1.7	2.2	0.5	15.7	407
Equatorial	23.7	16.8	6.3	0.6	8.5	4.2	0.0	2.6	8.7	778
Education										
No education	18.5	14.5	2.9	1.1	3.1	2.5	0.9	1.8	10.3	1,053
Primary	25.5	17.3	7.9	0.3	8.4	4.3	0.3	1.8	12.2	397
Sec & Above	23.5	12.9	10.6	0.0	11.8	8.2	0.0	0.0	15.3	89
Wealth index										
Poorest	15.9	13.7	0.9	1.3	0.9	0.9	0.3	2.2	10.9	321
Second	15.9	12.7	1.6	1.6	1.6	1.6	0.8	2.1	15.6	244
Third	17.2	12.4	3.8	1.0	2.4	3.4	0.0	2.9	6.7	209
Fourth	25.6	18.6	6.2	0.8	4.8	2.2	1.1	0.5	10.2	372
Richest	24.1	16.0	8.1	0.0	12.2	7.4	0.8	1.5	11.7	393
Total	**20.2**	**15.1**	**4.6**	**0.8**	**5.1**	**3.3**	**0.7**	**1.7**	**11.1**	**1,539**

MALARIA PREVENTION 4

4.1 MOSQUITO NETS

4.1.1 Background

Insecticide treated bed nets (ITNs) are one of the most effective preventive measures for malaria. Since the successful pilot of mass LLIN distributions in three states in 2008, mass distribution campaigns have been done in all states countrywide. Procurement of LLINs under the GF has been undertaken by the Population Services International (PSI) who is the Principal Recipient, Interchurches Medical Assistants (IMA); Malaria Consortium (MC), IFC, Merlin and the World Vision. The other procurements are conducted by USAID and WHO. The MoH is responsible for facilitating the importation and the custom clearance process including distribution of commodities within the country. All LLINs are distributed free of charge and are therefore affordable to the majority of the rural community. The Republic of South Sudan, through the Ministry of Health, Malaria Control Department with support from a number of partners, has distributed approximately 10 million insecticide treated mosquito nets across the country since 2008

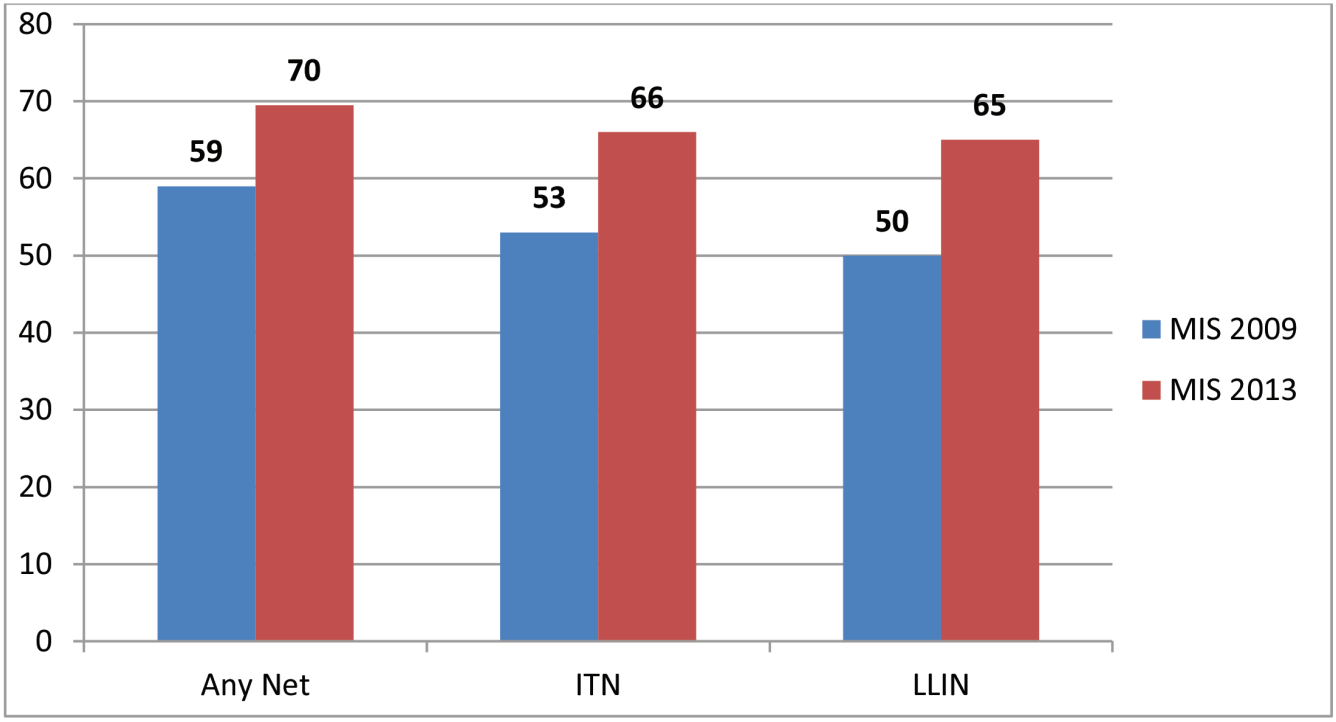
4.1.2 Ownership of Mosquito Nets

The 2013 SSMIS included questions on bed net ownership and use, type of net and source, and reasons for not using a net, if applicable. In addition, questions were asked to determine who had slept under each net the previous night and, if no one had, the reasons why the net was not used. Table 4.1 presents information on the percentage of households that have any type of mosquito net, an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN) in addition to households with at least one net for every two people, by residence, region, and wealth quintile.

Overall, 70 percent of households have at least one mosquito net, 66 percent have at least one ITN, and 65 percent have at least one LLIN. This implies that almost all ITNs owned by households in South Sudan are LLINs as was depicted in the 2009 MIS. Figure 4.1 shows that, compared with 2009 MIS, when 59, 53 and 50 percent, owned at least one mosquito net, ITN and LLIN respectively and there has been an increase in the ownership of each type of net. This increase in net ownership by households can be attributed to the LLIN mass distribution campaign supported by the Global Fund, etc for the National Malaria Control Programme (NMCP), and the MDG funds through the Republic of South Sudan.

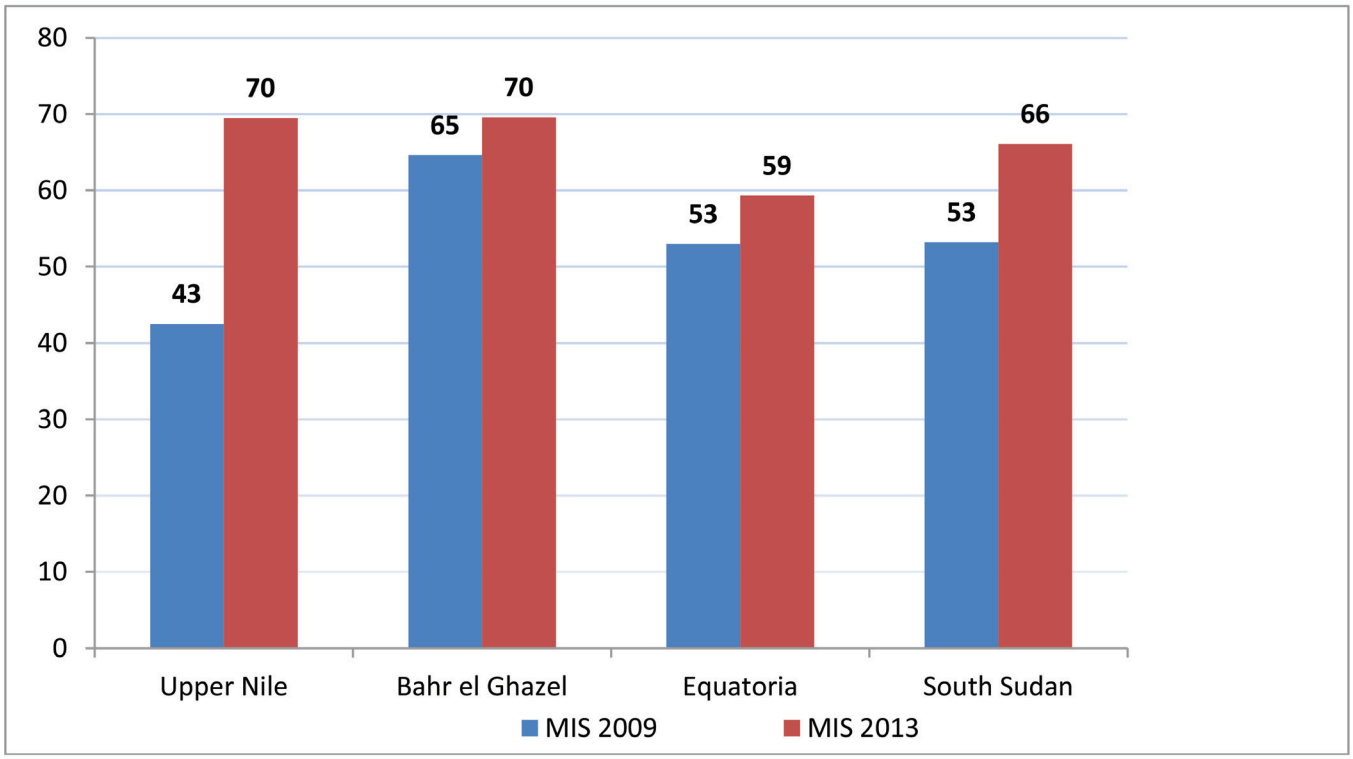
Figure 4.1 Trend in Ownership of Any mosquito Net, ITN or LLIN, 2009-2013

Ownership of at least one ITN varies widely by background characteristics. It is notably higher among



urban households (69 percent) than among urban households (65 percent). Among regions, households in Upper Nile and Bahr el Ghazel have a much higher ITN ownership (70 percent) than the households in Equatorial region (59 percent). Figure 4.2 shows the comparison of ITN ownership by region. There has been a sharp increase in the ownership of ITNs in Upper Nile from 43 percent in the 2009 MIS to 70 percent. As expected, the households in LLIN campaign areas are much more likely to own at least one ITN than households in areas where there are no LLIN campaigns.

Figure 4.2 Trend in Ownership of ITNs 2009-2013



In terms of wealth index for ownership of ITNs for households with at least one ITN, no specific trend is exhibited as residents in the third wealth quintile own more ITNs than residents in other quintiles. The disparity between the lowest quintile compared to the highest quintile was only 8 percent. In the 2009 survey the difference between the lowest and highest quintile was relatively larger at 24 percent. These findings could be attributed to the national free mass distribution campaigns of ITNs.

Although mosquito net ownership is an important indication of the success of a Vector Control Program, it is also important to determine if a household has a sufficient number of nets for those sleeping within the home. By assuming that each net is shared by two people in the household, universal net coverage within the population can be measured. Table 4.1 also shows the percentage of households with at least one mosquito net for every two persons who stayed in the household the night before interview.

Overall, 28 percent of households in South Sudan have reached universal mosquito net coverage; that is, almost three in ten five households have at least one net for every two persons who slept in the household the night before the survey. Universal net coverage is a little higher among urban households compared with rural households (39 percent and 26 percent, respectively). Twenty four percent of households in the Bahr el Ghazel have at least one net for every two people, compared with 35 percent of households in the Upper Nile region. By wealth quintile, the highest proportion of households to have reached universal ITN coverage is found within the highest wealth quintile.

Table 4.1: Ownership of Mosquito nets by Households:

Percentage of households with at least one and more than one mosquito net (treated or untreated), insecticide-treated net (ITN) or long-lasting insecticide-treated net (LLIN) and average number of nets of each type per household, by background characteristics, South Sudan MIS, 2013

Background characteristic	Percentage of households with at least one net for every two people	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 ITN	Percentage of households that have more than one ITN	Average number of ITNs per household	Percentage of households that have at least one LLIN	Percentage of households than have more than one LLIN	Average number of LLINs per household	Number of households
Residence											
Rural	26.2	68.2	54.0	1.8	65.3	50.7	1.6	64.8	50.3	1.7	2,398
Urban	38.6	77.6	67.9	2.6	69.1	59.7	2.2	68.1	58.4	2.0	474
Region											
Upper Nile	35.0	72.7	65.6	2.2	69.5	60.9	2.0	69.5	60.9	2.0	895
Bahr el Ghazel	24.4	73.6	56.7	1.9	69.6	53.0	1.8	68.8	52.3	1.7	982
Equatorial	26.1	63.2	47.4	1.7	59.3	43.6	1.5	58.1	42.7	1.5	995
Wealth index											
Poorest	22.2	66.8	48.9	1.7	62.7	45.3	1.6	61.9	44.8	1.5	622
Second	21.0	56.4	40.4	1.3	53.1	37.1	1.2	52.6	36.9	1.2	604
Third	34.7	77.4	65.8	2.1	75.0	62.7	2.0	74.5	62.7	2.0	496
Fourth	27.4	73.4	60.1	1.9	70.8	56.9	1.8	70.5	56.3	1.8	580
Richest	38.3	77.0	68.9	2.7	70.9	61.7	2.3	69.6	60.4	2.3	500
Total	**28.4**	**69.8**	**56.3**	**1.9**	**66.1**	**52.1**	**1.8**	**65.4**	**51.7**	**1.8**	**2,872**

An ITN is 1) a factory-treated net that does not require any re-treatment, 2) a pre-treated net that was obtained less than 12 months ago, or 3) a net that has been soaked/retreated less than 12 months ago. A long lasting insecticidal net (LLIN) is a factory-manufactured net that does not require any treatment

4.1.3 Source of Mosquito Nets

There are several ways to procure or obtain a mosquito net in South Sudan. A pregnant woman may receive a mosquito net during a routine antenatal care visit. Parents of children under age 5 may receive a net during a routine immunization visit to a health facility. Mosquito nets can also be obtained during mass distribution campaigns, and they can be purchased directly through various avenues. The percent distribution of nets by source, according to background characteristics, is shown in Table 4.2.

NGOs are the main distribution channel for mosquito nets (37 percent). Other major sources of nets in South Sudan are government health facilities (28 percent) and market/vendor (13 percent). At the regional level, considerable variation exists in source of nets. Fifty percent of nets in Upper Nile are obtained from an NGO which most probable was through a net distribution campaign compared with only 21 percent in Equatorial region. Rural residents are more likely to get their nets from government facilities than their urban counterparts (31 and 20 percent respectively).

Table 4.2: Source of Mosquito Nets
Percentage distribution of nets by source, according to background characteristics South Sudan MIS, 2013

Background characteristic	Government health facility	NGO	Shop	Community based distributor/outreach	Vendor	Others	Don't know/ Missing	Number of Nets
Residence								
Rural	30.5	39.2	8.4	5.5	13.1	0.4	2.8	4,219
Urban	19.8	29.1	18.6	8.2	14.5	1.1	8.3	1,250
Region								
Upper Nile	19.6	49.8	13.0	4.0	8.9	0.6	4.4	1,947
Bahr el Ghazel	25.1	38.1	7.4	4.2	7.4	0.7	0.9	1,829
Equatorial	41.1	21.1	11.6	11.8	11.6	0.4	6.9	1,693
Wealth index								
Poorest	31.8	36.0	5.0	7.3	16.7	0.4	2.9	1,014
Second	20.5	46.8	7.9	4.1	16.7	0.5	3.4	766
Middle	28.7	42.9	11.0	4.0	11.9	0.2	1.5	1,039
Fourth	31.4	41.4	8.2	7.6	8.7	0.6	2.2	1,107
Richest	27.3	25.4	17.2	7.0	14.2	0.9	7.8	1,543
Total	**28.1**	**37.0**	**10.7**	**6.1**	**13.4**	**0.5**	**4.0**	**5,469**

4.2. USE OF MOSQUITO NETS

4.2.1 Use of Mosquito Nets by Household Population

Mosquito net coverage of the entire population is necessary to accomplish large reductions in the malaria burden. Although vulnerable groups, such as children under age 5 and pregnant women, should still be prioritised, the equitable and communal benefits of wide-scale ITN use by older children and adults should be promoted and evaluated by national malaria control programs (Killeen, 2007). The 2013 SSMIS asked about use of mosquito nets by household members during the night before the survey. These data are shown on Table 4.2.

Table 4.3 shows that 47 percent of the household population slept under any net the night before the survey, 44 percent slept under an ITN, and 43 percent slept under an LLIN. ITN use among the general population is highest for residents in urban areas (55 percent) compared with those in rural areas (45 percent). Women and girls (46 percent) are more likely than men and boys (41 percent) to have slept under an ITN the previous night. By region, however, ITN use is the highest among people living in the Upper Nile region (50 percent) and lowest among people living in Equatorial region. ITN use steadily increases as wealth also increases. No specific pattern is depicted by wealth quintile as 52 percent in the middle wealth quintile slept under an ITN the previous night compared with 45 percent of those in the highest wealth quintile.

As expected, ITN use is higher among households that own an ITN. In households that own at least one ITN, 63 percent of the population slept under an ITN the night before the survey. In households with at least one ITN, women and girls are more likely than men and boys to sleep under an ITN (66 percent and 60 percent, respectively). There is only a slight urban-rural difference in the percentage of population who utilised an ITN the night before the survey (65 percent and 63 percent, respectively). Among households that own an ITN, Upper Nile Region residents are more likely than those living in other regions to sleep under an ITN (69 percent compared with 66 percent in the Bahr el Ghazel and 54 percent in the Equatorial Region). Two in three people in the middle wealth quintile who slept in a household that owned an ITN used an ITN the previous night. People in other wealth quintiles are less likely to use an ITN the previous night.

Table 4.3 Use of mosquito nets by all Household Members

Percentage of household members who slept under a mosquito net (treated or untreated), an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN) the night before the survey, by background characteristics, South Sudan MIS, 2013

	All household individuals in all households				All members in a household with an ITN		All members in a household with an LLIN	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN last night2	Percentage who slept under an LLIN last night3	Number	Percentage who slept under an ITN last night2	Number	Percentage who slept under an LLIN last night2	Number
Sex								
Male	44.4	41.1	40.8	8,822	60.3	6,002	60.5	5,930
Female	49.7	45.7	45.3	9,544	66.3	6,570	66.4	6,504
Residence								
Rural	45.4	42.6	42.3	15,017	63.0	10,140	63.1	10,060
Urban	55.0	47.7	47.0	3,349	65.3	2,432	65.9	2,374
Region								
Upper Nile	53.6	49.7	49.7	5,890	69.0	4,237	69.0	4,237
Bahr el Ghazel	50.9	47.3	47.0	6,293	66.4	4,468	66.7	4,418
Equatorial	37.1	33.3	33.1	6,183	53.8	3,867	53.9	3,779
Wealth index								
Poorest	42.7	39.6	39.2	3,947	61.4	2,545	61.8	2,506
Second	39.7	36.6	36.3	3,356	64.5	1,899	64.6	1,882
Middle	54.4	51.7	51.7	3,047	67.7	2,327	67.9	2,319
Fourth	48.0	45.2	44.9	3,734	62.1	2,711	62.0	2,700
Richest	51.2	45.2	44.5	4,282	62.3	3,090	62.7	3,027
Total	**47.1**	**43.5**	**43.1**	**18,366**	**63.4**	**12,572**	**63.6**	**12,434**

2 An insecticide-treated net (ITN) is 1) a factory-treated long-lasting insecticidal mosquito net (LLIN) which does not require any further treatment, or 2) a factory net, with or without an insecticide kit, which has subsequently been soaked with insecticide within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months

3 A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.

4.2.2 Use of Mosquito Nets by Children under Five

Children under five years of age are considered the most vulnerable to severe complications of malaria infection due to their lack of acquired immunity. Those living in areas of high malaria transmission naturally acquire immunity to the disease over time (Doolan et al., 2009). Acquired immunity is not the same as sterile immunity—that is, acquired immunity does not prevent P. falciparum infection but rather protects against severe disease and death. Age is an important factor in determining levels of acquired immunity to malaria. For about six months following birth, antibodies acquired from the mother during pregnancy protect children born in areas of endemic malaria. This immunity is gradually lost and children start to develop their own immunity to malaria. The pace at which immunity develops depends on the exposure to malarial infection, and in high malaria-endemic areas, children are thought to attain a high level of immunity by their fifth birthday. Such children may experience episodes of malaria illness but usually do not suffer from severe, life-threatening malaria.

Table 4.4 shows the use of mosquito nets by children under age 5. Nationally, 46 percent of South Sudanese children under age 5 slept under an ITN the previous night. ITN utilization among children tends to decrease with age. For example, over half of children less than 12 months old (51 percent) slept under an ITN compared with children age 48-59 months (42 percent). ITN utilization varies slightly by child's sex- boys are more likely than girls to have slept under an ITN the night before the survey (50 percent compared with 49 percent). Children in urban areas are more likely than children in rural areas to use ITNs (49 percent and 45 percent, respectively). Those living in the Upper Nile Region are more likely than others to have slept under an ITN.

Not surprisingly, ITN utilization is 1.4 times higher among children that slept in households that own at least one ITN than among children in all households (66 vs 46 percent respectively). In households with at least one ITN, 66 percent of children slept under an ITN the night before the survey, an improvement from only 25 percent in 2009 MIS. The results further show that younger children were more likely to sleep under an ITN if a household owns one than older ones; for example 71 percent of children less than 12 months slept under an ITN in households that own an ITN compared with 63 percent of children aged 48-59 month.

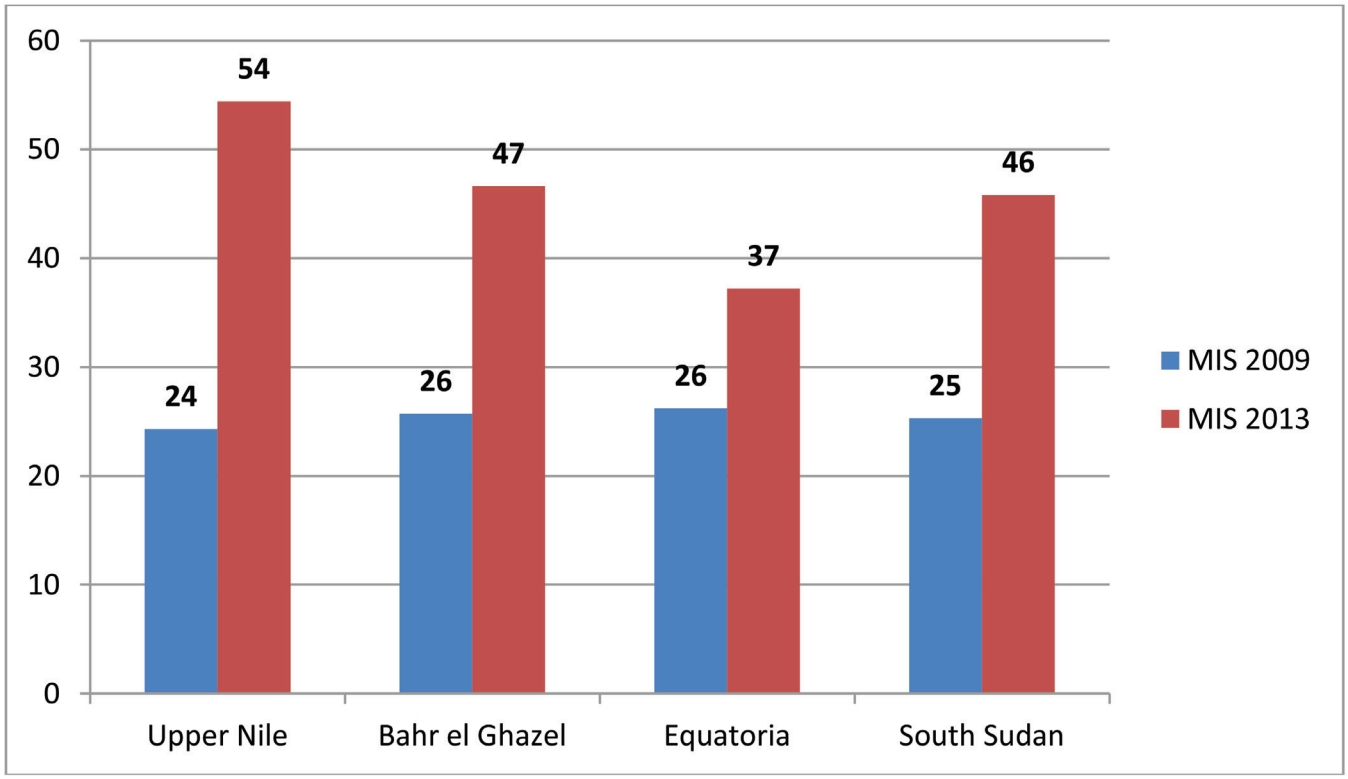
Table 4.4 Use of mosquito nets by children (Dejure household members)

Percentage of children under five years of age who slept under a mosquito net (treated or untreated), an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN) the night before the survey, by background characteristics, South Sudan MIS, 2013

Background characteristic	Children under 5 years in all households				Children under 5 in a household with an ITN		Children under 5 in a household with an LLIN	
	Percentage who slept under any net last night	Percentage who slept under an ITN last night2	Percentage who slept under an LLIN last night3	Number of children	Percentage who slept under an ITN last night2	Number of children	Percentage who slept under an LLIN last night2	Number of children
Age (in years)								
<1	54.5	50.8	50.4	719	71.1	512	71.1	508
1	51.4	46.6	46.4	597	66.7	417	66.9	414
2	47.5	43.7	43.4	737	65.3	490	65.3	487
3	49.1	46.1	45.8	842	64.5	602	64.4	599
4	45.1	42.4	42.1	784	62.8	527	63.3	520
Sex								
Male	50.1	46.7	46.5	1,894	66.8	1,320	67.1	1,308
Female	48.6	44.9	44.5	1,785	65.1	1,228	65.0	1,220
Residence								
Rural	48.1	45.2	44.9	3,030	65.6	2,082	65.7	2068
Urban	55.3	48.6	48.5	649	67.6	466	68.0	460
Region								
Upper Nile	57.7	54.4	54.4	1,163	74.7	848	74.7	848
Bahr el Ghazel	50.9	46.6	46.4	1,235	66.6	862	66.8	855
Equatorial	40.4	37.2	36.6	1,281	56.6	838	56.6	825
Wealth index								
Poorest	43.1	40.2	39.9	788	62.7	506	62.9	499
Second	41.2	38.7	38,2	670	66.8	385	66.7	381
Middle	56.0	53.5	53.5	595	70.0	454	70.4	452
Fourth	52.3	49.3	49.2	805	66.0	602	65.8	602
Richest	54.3	48.0	47.6	821	65.2	601	65.5	594
Total	**49.4**	**45.8**	**45.5**	**3,679**	**66.0**	**2,548**	**66.1**	**2,528**

Figure 4.3 shows the use of mosquito nets by children under age 5 in the two South Sudan MIS surveys. On a national level, there has been notable change in ITN utilization among children between the two survey periods. The percentage of children sleeping under an ITN has almost doubled (25 and 46 percent). Variations also are observed within the regions. The proportion of children that slept under an ITN the previous night has more than doubled in Upper Nile Region between 2009 and 2013, from 24 percent to 54 percent and has generally increased in other regions.

Figure 4.3 Trend in Use of ITN by Children Under 5 Years, 2009-2013



4.2.3 Use of Mosquito Nets by Pregnant Women

Pregnancy suppresses immunity and women in their first pregnancies are especially at increased risk for severe malaria compared with other adults. In addition, malaria in pregnant women is frequently associated with the development of anaemia; it also interferes with the maternal-fetus exchange, leading to low-birth-weight infants. In order to prevent complications from malaria in pregnancy such as anaemia, low birth weight, and trans-placental parasitaemia, the NMCP encourages all pregnant women to sleep under an ITN.

Table 4.5 shows the use of mosquito nets by pregnant women by background characteristics. Overall, half of pregnant women in South Sudan (50 percent) slept under an ITN the previous night. ITN utilization among pregnant women is highest among those women living in urban areas (58 percent) and among those in Bahr el Ghazel (57 percent).

As expected, use of ITN is considerably higher for women who live in households that own at least one ITN than for women in all households. Overall, 73 percent of pregnant women who live in households with at least one ITN slept under an ITN the night before the survey compared with 50 percent of women in all households. Variations in ITN utilization by pregnant women in households with at least one ITN by background characteristics are similar to those found in all households.

Table 4.5 Use of mosquito nets by Pregnant Women

Percentage of pregnant women who slept under a mosquito net (treated or untreated), an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN) the night before the survey, by background characteristics, South Sudan MIS, 2013

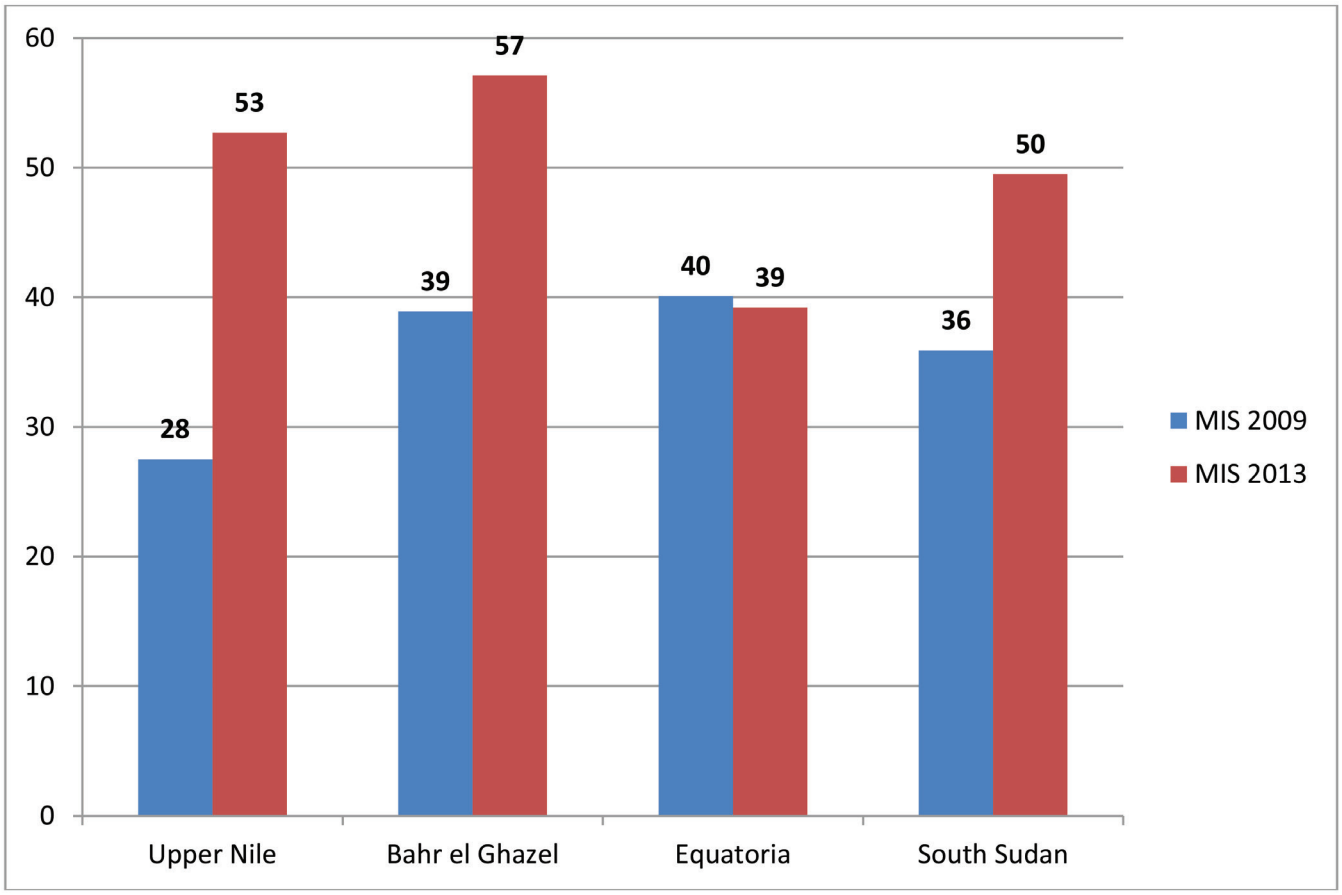
	Pregnant women in all households				Pregnant women in a household with an ITN		Pregnant women in a household with an LLIN	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN last night[2]	Percentage who slept under an LLIN last night[3]	Number of Women	Percentage who slept under an ITN last night[2]	Number of Women	Percentage who slept under an LLIN last night[2]	Number of Women
Residence								
Rural	52.6	49.4	49.4	352	73.1	238	73.1	238
Urban	58.1	50.0	50.0	74	72.6	51	72.6	51
Region								
Upper Nile	57.3	52.7	52.7	129	74.7	91	74.7	91
Bahr el Ghazel	61.1	57.1	57.1	149	73.9	115	73.9	115
Equatorial	42.6	39.2	39.2	148	69.9	83	69.9	83
Wealth index								
Poorest	48.4	46.2	46.2	91	73.7	57	73.7	57
Second	38.4	36.1	36.1	86	73.8	42	73.8	42
Middle	66.2	61.8	61.8	68	76.4	55	76.4	55
Fourth	58.1	54.7	54.7	86	74.6	63	74.6	63
Richest	59.0	51.6	51.6	95	68.1	72	68.1	72
Total	**53.5**	**49.5**	**49.5**	**426**	**73.0**	**289**	**73.0**	**289**

2 An insecticide-treated net (ITN) is 1) a factory-treated long-lasting insecticidal mosquito net (LLIN) which does not require any further treatment, or 2) a factory net, with or without an insecticide kit, which has subsequently been soaked with insecticide within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months

3 A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.

Figure 4.4 shows trends of ITN utilization among pregnant women on a national and regional level. At the national level, there has been considerable change in ITN use among pregnant women (36 percent measured in 2009 compared with 50 percent in 2013). Likewise, regional trends in the Upper Nile and Bahr el Ghazel regions are substantial. ITN utilization among pregnant women in the Upper Nile has increased from 28 percent in 2009 to 53 percent in 2013. In the Equatorial, on the other hand, ITN utilization among pregnant women has only slightly decreased from 40 percent to 39 percent. Use of mosquito net by pregnant women in the Bahr el Ghazel Region has also increased considerably from 39 percent in 2009 to 57 percent in 2013.

Figure 4.4 Trend in Use of ITNs by Pregnant Women, 2009-2013



4.2.4 Use of Mosquito Nets by Women

Table 4.6 shows the usage of nets by all women age 15-49 years. Over a half (55 percent) of all women in all households reported that they slept under any net the night before the survey, an increase from about four in ten (39 percent) in the 2009 MIS. A slightly lower percentage (50 percent) reported that they slept under an ITN the night before the survey, an increase from 32 percent in 2009. The data further show that 49 percent slept under an LLIN the night before the survey, indicating that almost all ITNs are LLINs.

Regardless of the type of net (any net, ITN, or LLIN), net usage is higher among urban women (50 to 61 percent) than among rural women (49 to 53 percent). Women in Upper Nile (56 to 61 percent) are the most likely to have slept under any of the specified nets the previous night, and women in Equatorial region are the least likely (40 to 45 percent). No specific trend is shown by the wealth.

Table 4.6 Use of mosquito nets by Women 15-49 years

Percentage of women 15-49 years who slept under a mosquito net (treated or untreated), an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN) the night before the survey, by background characteristics, South Sudan MIS, 2013

	Women 15-49 years in all households				Women 15-49 years in a household with an ITN		Women 15-49 years in a household with an LLIN	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN last night[2]	Percentage who slept under an LLIN last night[3]	Number of Women	Percentage who slept under an ITN last night[2]	Number of Women	Percentage who slept under an LLIN last night[2]	Number of Women
Residence								
Rural	52.9	49.5	49.2	2,821	72.6	1,922	72.6	1,910
Urban	61.2	51.5	50.4	750	68.6	561	69.8	540
Region								
Upper Nile	60.7	56.1	56.1	1,140	76.2	840	76.2	840
Bahr el Ghazel	59.2	54.4	54.0	1,118	76.4	795	76.4	789
Equatorial	45.4	40.8	39.7	1,313	63.0	848	63.3	821
Wealth index								
Poorest	51.6	47.2	46.8	723	72.6	470	72.5	466
Second	46.9	43.1	42.5	636	75.0	364	74.7	360
Middle	61.3	58.5	58.5	592	75.1	461	75.2	460
Fourth	56.4	53.5	53.2	709	72.7	521	72.6	519
Richest	56.6	48.6	47.6	911	66.3	667	67.1	645
Total	**54.6**	**49.9**	**49.4**	**3,571**	**71.7**	**2,483**	**72.0**	**2,450**

2 An insecticide-treated net (ITN) is 1) a factory-treated long-lasting insecticidal mosquito net (LLIN) which does not require any further treatment, or 2) a factory net, with or without an insecticide kit, which has subsequently been soaked with insecticide within the past 12 months, or 3) a net that has been soaked with insecticide within the past 12 months

3 A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.

4.3 REASONS FOR NOT USING MOSQUITO NET

Net ownership does not guarantee usage. Table 4.7 shows the percent distribution of households that own a net that no one slept under during the night preceding the survey, by the main reason for not using the net.

Overall, 14 percent of households had at least one net that was not slept under the previous night, a decrease from 20 percent of households in the 2009 SSMIS. The most common reason why no one slept under the household net the previous night is that it was not hung up (25 percent of households), with the percentages being higher among households in the Equatorial Region (39 percent). Sixteen percent of households reported that there were no mosquitoes, with the percentage being higher in rural households (20 percent), households in Bahr el Ghazel (46 percent), and households in the fourth highest wealth quintile (25 percent). Finally, 9 percent of households reported that the person to use the net was not around.

Table 4.7: Reasons for not using a mosquito net for sleeping

Percentage of households with at least one mosquito net that was not slept under the previous night, and among those, percentage reporting various reasons for not using a net for sleeping the previous night, by background characteristics, South Sudan MIS, 2013

Background characteristic	Percentage of households with at least one mosquito net that was not slept under the previous night	Number of Households with at least one mosquito net	Number of Nets that were not slept under the previous night	No mosquitoes	End of rainy season	Not hung up	Too Hot	Person not around	No space	Other	Number of households with at least one net that was not slept under the previous night
Residence											
Rural	13.9	1,623	421	19.5	2.6	22.6	4.0	8.1	3.3	6.4	225
Urban	15.5	367	98	2.0	0.0	37.8	2.0	14.3	1.0	19.4	57
Region											
Upper Nile	12.3	645	139	20.1	1.4	12.2	8.6	13.0	0.0	3.6	79
Bahr el Ghazel	8.1	717	115	46.1	3.5	10.4	0.0	7.8	6.7	5.2	58
Equatorial	23.1	628	265	1.1	1.9	38.9	2.6	7.9	2.6	13.2	145
Wealth index											
Poorest	11.1	413	77	9.1	0.0	27.3	10.4	11.7	0.0	5.2	46
Second	11.2	338	67	7.5	3.0	23.9	9.0	1.5	1.5	9.0	38
Middle	14.2	380	105	21.9	4.8	22.9	2.9	3.8	7.6	5.7	54
Fourth	13.1	423	106	24.5	3.8	23.6	0.0	12.3	0.9	5.7	56
Richest	20.2	436	164	14.0	0.0	28.1	1.2	12.8	3.1	14.6	88
Total	**14.2**	**1,990**	**519**	**16.2**	**2.1**	**25.4**	**3.7**	**9.3**	**2.9**	**8.7**	**282**

4.4 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

Intermittent preventive treatment of malaria (IPTp) during pregnancy has been the standard of care in South Sudan. The national policy guidelines for IPTp require a pregnant mother to take at least two treatment doses of an effective antimalarial drug during routine antenatal care visits. The drug used for IPT in pregnancy is sulphadoxine-pyrimethamine (SP). In the 2013 SSMIS, women who had a live birth in the two years preceding the survey were asked several questions regarding the time they were pregnant with their most recent birth. They were asked if anyone told them during their pregnancy that pregnant women need to take medicine to keep them from getting malaria. They were also asked if they had taken any drugs to prevent getting malaria during that pregnancy and, if so, which drug. If respondents had taken SP/Fansidar, they were further asked how many times they took it and whether they had received it during an antenatal care visit. IPTp data are presented in Table 4.8.

Table 4.8 shows that over a half of pregnant women (54 percent) took an antimalarial drug during their last pregnancy. Almost four in ten (38 percent) of pregnant women who took any antimalarial drug took at least one dose of SP/Fansidar during their pregnancy; one third of the women of these women received the SP/Fansidar at an ANC visit. Close to one in three women (32 percent) reported taking two or more doses of SP/Fansidar during their last pregnancy, or received IPTp.

Table 4.8. Prophylactic use of antimalarial drugs and use of Intermittent Preventive Treatment(IPT) by women during pregnancy

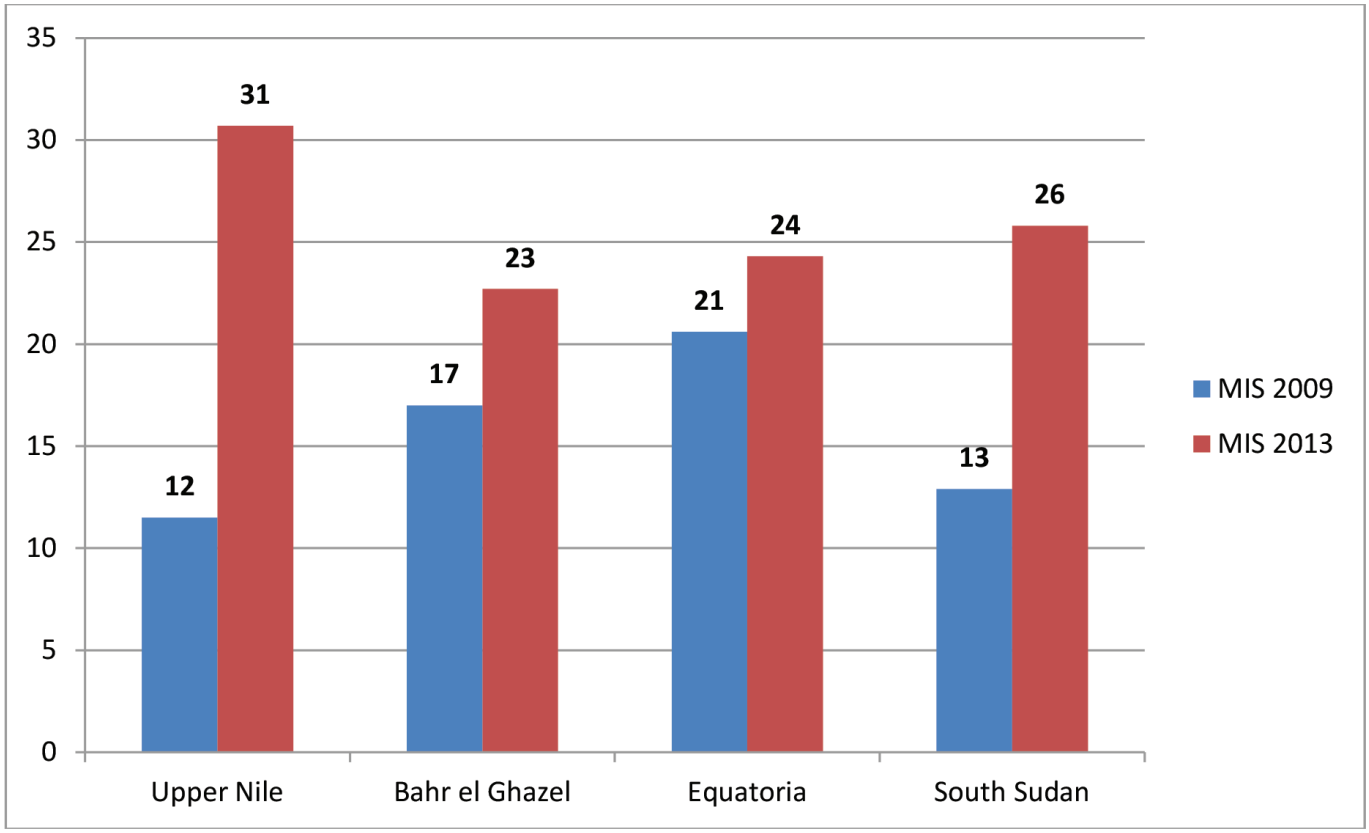
Percentage of women age 15-49 with a live birth in the two years preceding the survey who during the pregnancy took any antimalarial drug for prevention, percentage who took SP/Fansidar, any and two or more doses, and who received Intermittent Preventive Treatment (IPT), by background characteristics, according to background characteristics South Sudan MIS, 2013

Background characteristic	SP Fansidar			Intermittent Preventive Treatment		
	Percentage who took any antimalarial drug	Percentage who took any SP/Fansidar	Percentage who took 2+ doses	Percentage who received any SP/ Fansidar during an ANC visit	Percentage who received 2+ doses, at least one of which was during an ANC visit	Number of Women
Residence						
Rural	50.5	34.8	29.5	29.6	23.5	944
Urban	70.6	53.2	44.0	49.5	35.8	218
Region						
Upper Nile	57.8	43.3	39.7	34.8	30.7	365
Bahr el Ghazel	49.6	36.1	27.3	33.0	22.7	352
Equatorial	55.3	35.7	39.9	32.4	24.3	445
Education						
No schooling	47.2	33.6	27.8	27.5	21.0	802
Primary	70.8	49.0	42.1	45.9	36.6	295
Sec & Above	68.3	47.6	39.7	50.8	38.1	65
Wealth index						
Poorest	39.8	28.1	19.3	22.8	14.9	228
Second	39.8	30.2	26.9	29.7	23.6	212
Middle	53.3	37.0	32.0	29.5	24.5	200
Fourth	65.7	46.3	39.0	38.6	29.7	246
Richest	68.0	46.4	40.9	42.8	34.1	276
Total	**54.3**	**38.2**	**32.2**	**33.3**	**25.8**	**1,162**

Slightly over a quarter of the women (26 percent) took at least two doses of SP/Fansidar received at least one dose during an antenatal care (ANC) visit. Urban women are slightly more likely than rural women to have taken an antimalarial drug during pregnancy (71 percent relative to 51 percent). Among the regions, women living in the Upper Nile region (58 percent) are more likely than those living elsewhere to have taken an antimalarial drug during their last pregnancy. The proportion of pregnant women that took an antimalarial drug increases with both education and wealth. For example, women in the wealthiest households are more likely than other women to take an antimalarial drug during pregnancy (68 percent in wealthiest compared with 40 percent lowest). Differentials in the use of SP/Fansidar across subgroups of women are similar to those in any antimalarial drug.

Figure 4.5 compares IPTp use among women in the past two years. On a national level, the overall use of IPTp during pregnancy in MIS 2009 is exactly half that recorded in the 2013 MIS (13 percent compared with 26 percent). As regards to adherence to the recommended prevention measures for pregnant women, the proportion of women who received two or more doses of SP during pregnancy has increased since 2009 in all the three regions.

Figure 4. 5 Percentage of women 15-49 years with live birth in two years preceding the survey who received two doses of SP/Fansidar one of them at an ANC Visit 2009-2013



4.5 INDOOR RESIDUAL SPRAYING

Indoor residual spraying (IRS) is another vector control intervention used to control malaria transmission. IRS is the spraying of the interior walls and ceilings of a dwelling with long-lasting insecticide. It reduces the transmission of malaria by killing adult female mosquitoes when they rest on the walls of the dwelling after feeding.

In the late 70s and early 80s Indoor Residual Spraying (IRS) and Larviciding were implemented by the local Vector Control Units to prevent malaria transmission in and around the major towns and municipalities. However, due to the collapse of infrastructure and public services, these interventions stopped in 1983 and are currently not available in South Sudan.

Recently, IRS has only been piloted as a malaria epidemic response strategy by Mentor Initiative project in Warrap and Malakal (Upper Nile) states to protect the most vulnerable population, the IDPs, returnees and host communities affected by war, conflict and/or floods. The operational coverage for 2012 was at 2% far

less than the WHO recommended coverage for impact of 85%. It was noted that presently there is no national IRS policy available and no operationally scaled-up IRS programme implemented in the country. National IRS guidelines and training modules are currently being developed in line with WHO recommendations to cover storage and maintenance of equipment and commodities (insecticides and pumps with WHOPES approved specifications for IRS) including insecticide safety and disposal of waste. Two cycles of IRS will be conducted annually to afford effective protection throughout the peak malaria transmission period which coincides with the wet/rainy season in South Sudan.

To obtain information on the prevalence of indoor residual spraying, all households interviewed in the 2013 SSMIS were asked whether the interior walls of their dwelling had been sprayed to protect against mosquitoes during the 12-month period before the survey and, if so, who had sprayed the dwelling. The percentage of households with IRS in the past 12 months is presented in Table 4.9.

Table 4.9 shows that 3 percent of all households in South Sudan were sprayed in the past 12 months. By residence, urban households are more likely to have had IRS (7 percent compared with 2 percent). Among the regions, a slightly higher proportion of households in the Upper Nile region (4 percent) have been sprayed compared with households in the other regions. While there is no apparent pattern by wealth quintile, households in the highest and fourth quintile are the most likely to have been sprayed.

Table 4.9 also shows which households are covered by any vector control intervention;.by combining IRS with use of an ITN, it is possible to look at a combined indicator of malaria protection at the household level. Overall, 66 percent of households are protected either by owning an ITN or having received IRS in the past 12 months. Households in urban areas are more likely to have at least one ITN and/or IRS in the past 12 months (70 percent each) compared with rural households (66 percent). Households in the Upper Nile and Bahr el Ghazel are also more likely to have at least one ITN and/or IRS in the past 12 months (70 percent) compared with those in the Equatorial Region (60 percent). The proportion of households covered by this vector control intervention does not follow any trend as far as the wealth quintiles are concerned.

Table 4.9 Indoor residual spraying

Percentage of households reporting indoor residual spraying in the previous 12 months and percentage of households sprayed in the previous 12 months or having at least one ITN, by background characteristics, South Sudan MIS 2013

Background characteristic	Percentage of households sprayed in the last 12 months	Percentage of households sprayed in the previous 12 months or having at least one ITN	Number of Households
Residence			
Rural	1.6	65.6	2,398
Urban	7.2	70.1	474
Region			
Upper Nile	4.3	69.6	895
Bahr el Gazel	3.3	70.3	982
Equatorial	0.2	59.5	995
Wealth index			
Poorest	2.3	63.2	622
Second	0.8	53.4	604
Middle	2.2	75.1	496
Fourth	2.8	71.0	580
Richest	4.2	71,1	500
Total	**2.5**	**66.3**	**2,872**

ANAEMIA AND MALARIA IN CHILDREN AND PREGNANT WOMEN 5

5.1 ANAEMIA AND MALARIA AMONG CHILDREN

Anaemia, defined as a low level of functional haemoglobin (Hb) in the blood, decreases the amount of oxygen reaching the tissues and organs of the body, thereby reducing their capacity to function. Because all human cells depend on oxygen for survival, anaemia in children can lead to severe health consequences, including impaired cognitive and motor development, stunted growth, and increased morbidity from infectious diseases. There are several types of anaemia, produced by a variety of underlying causes. Inadequate intake of iron, folate, vitamin B12, or other nutrients accounts for the majority of cases of anaemia in many populations. However, in malaria endemic areas, malaria accounts for a significant proportion of anaemia in children under age 5. Other causes of anaemia include thalassemia, sickle cell disease, and intestinal worms. As anaemia is a major cause of morbidity and mortality associated with malaria, prevention and treatment of malaria among children and pregnant women is essential. Promotion of the use of insecticide-treated mosquito bed nets and deworming medication every six months for children under age 5 are two important measures that can be taken to reduce the prevalence of anaemia among children.

All children age 6-59 months living in the households selected for the 2013 SSMIS were eligible for haemoglobin and malaria testing. The HemoCue system was used to measure the concentration of haemoglobin in the blood. The rapid diagnostic blood test for detection of histidine rich protein-2 (HRP2) was used to detect malaria. Thick blood smears and thin blood films were made in the field and transported to a laboratory at Juba Teaching Hospital, where microscopy was performed to determine the presence of malaria parasites and to identify the parasite species.

Table 5.1 shows the total number of children age 0-59 months eligible for testing and the percentages actually tested for anaemia and malaria. Of the 3,266 children age 0-59 months eligible for testing, 92 percent were tested for anaemia using the HemoCue portable machine, 91 percent were tested for malaria using the rapid diagnostic test, and 86 percent were tested for malaria using blood smears collected for malaria microscopy. The coverage levels were uniformly high across most of the population. Testing coverage was somewhat lower among younger children age 0-11 months (80 percent for anaemia) and among children in Bahr el Ghazel (88 percent).

Table 5.1: Coverage of testing for anemia and malaria in Children under 5 years

Percentage of children under 5 years who were tested for anemia and for malaria, by background characteristics, South Sudan MIS 2013

	Percentage tested for			
Background characteristics	**Anaemia**	**RDT**	**Microscopy**	**Number of Children**
Age (in years)				
<1	79.7	80.3	74.3	320
1	92.3	92.8	86.9	595
2	93.5	92.8	86.9	708
3	93.5	93.3	87.9	821
4	92.2	91.6	87.5	782
Residence				
Rural	91.0	90.9	85.1	2,653
Urban	94.4	93.7	90.1	573
Region				
Upper Nile	92.0	90.9	88.2	1,011
Bahr el Ghazal	87.7	87.9	82.9	1,132
Equatorial	95.3	95.5	87.4	1,083
Wealth index				
Poorest	88.0	88.4	81.6	674
Second	91.5	91.0	86.1	611
Middle	90.3	89.7	86.9	536
Fourth	93.0	92.4	86.1	697
Richest	94.8	94.8	89.6	708
Total	91.6	91.4	86.1	3,226

5.1.1 Anaemia Prevalence among Children

Table 5.2 shows the percentage of children age less than 59 months with haemoglobin (Hb) lower than 11.0 grams per decilitre (g/dl), by background characteristics. The World Health Organization (WHO) has recommended specific Hb levels below which a child is specified as having anaemia. Children less than 5 years old are considered anaemic if the Hb concentration levels are below 11.0 g/dl

Table 5.2 shows the percentage of children age 0-59 months old classified as having mild, moderate, and severe anaemia, by background characteristics1. The results of the 2013 SSMIS show that more than half of the children (54 percent) 0-59 months are anaemic (Hb concentration levels are below 11.0 g/dl). Twenty-four percent are mildly anaemic (Hb levels of 10.0-10.9 g/dl), 22 percent are moderately anaemic (Hb levels of 8.0-9.9 g/dl), and 8 percent are severely anaemic (Hb levels below 8.0 g/dl). Based on these findings, anaemia seems to be a significant public health problem in South Sudan though the levels are slightly lower as was reported in the 2009 MIS (Figure 5.1). The prevalence of severe anaemia is highest among children age 24-36 months (12 percent), rural children (8 percent), and children living in Bahr el Ghazel (8 percent). Prevalence of severe anaemia is reversely associated with wealth; it decreases from 9 percent among children in the poorest households to 6 percent of children in the richest households.

Prevalence of any anaemia is highest among children age 12-23 months (69 percent), male children (57 percent), and children living in rural areas (55 percent). The proportion of children with any anaemia ranges from 51 percent in Equatorial region to 56 percent in Upper Nile. Prevalence for any anemia also decreases with wealth.

Table 5.2: Prevalence of anemia in children

Percentage of children aged 5 years and below classified as having anemia, by background characteristics, South Sudan MIS, 2013

Anaemia Status by hemoglobin level

Background characteristic	Mild (10.0-10.9 g/dl)	Moderate (8.0-8.9 g/dl)	Severe (Below 8.0 g/dl)	Any Anemia	Number of children
Age (in years)					
<1	24.3	30.9	5.2	60.5	281
1	30.5	28.7	9.6	68.7	542
2	22.5	27.3	11.9	61.5	661
3	20.7	19.5	6.8	47.0	761
4	21.7	11.8	4.8	38.0	717
Residence					
Rural	24.3	22.5	8.3	55.1	2,418
Urban	19.6	20.9	5.6	46.0	544
Sex of Child					
Male	23.6	24.5	8.7	56.9	1,533
Female	23.3	19.7	6.8	49.9	1,429
Region					
Upper Nile	24.4	24.1	7.3	55.8	931
Bahr el Ghazal	26.1	19.4	8.3	53.7	996
Equatorial	20.1	23.2	7.8	51.0	1,035
Wealth index					
Poorest	21.9	25.6	8.8	56.3	594
Second	25.9	21.5	8.6	55.9	559
Middle	25.7	20.7	7.4	53.8	485
Fourth	21.8	21.8	7.7	51.4	651
Richest	23.0	21.1	6.5	50.6	673
Total	**23.5**	**22.2**	**7.8**	**53.5**	**2,962**

Figure 5.1 Trend in Prevalence of Anaemia in Children Under 5 Years, 2009-2013

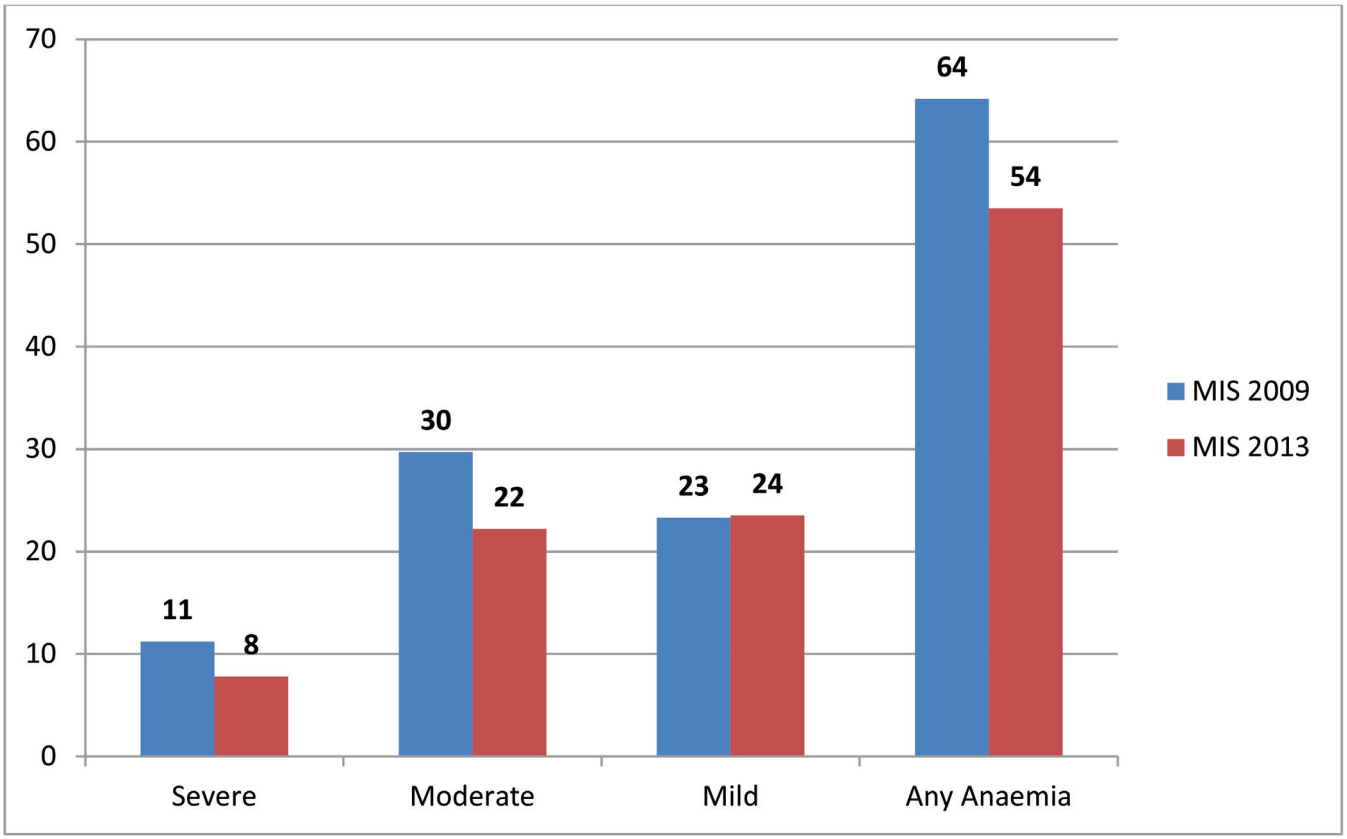


Table 5.4 shows the total number of pregnant women 15-49 years eligible for testing and the percentages actually tested for anaemia and malaria. Of the 434 women eligible for testing, 95 percent were tested for anaemia using the HemoCue portable machine, and the same percentage were tested for malaria using the rapid diagnostic test, and 94 percent were tested for malaria using blood smears collected for malaria microscopy. The coverage levels were uniformly high across most of the population. Testing coverage was somewhat lower among urban (93 percent) women for malaria RDT and Anaemia than for urban women (93 percent).

Table 5.3: Coverage of testing for anemia and malaria in Pregnant Women

Percentage of pregnant women who were tested for anemia and for malaria, by background characteristics, South Sudan MIS 2013

Background characteristics	Percentage tested for: Anaemia/RDT	Percentage tested for: Microscopy	Number of Women
Residence			
Rural	95.0	94.2	74
Urban	93.2	94.6	360
Region			
Upper Nile	94.7	95.5	132
Bahr el Ghazal	92.8	92.2	153
Equatorial	96.6	95.3	149
Wealth index			
Poorest	96.8	95.7	93
Second	91.0	88.7	89
Middle	93.1	95.9	73
Fourth	96.6	95.4	87
Richest	95.7	95,7	92
Total	94.7	94.2	434

5.1.2 Anaemia Prevalence among Pregnant Women

Table 5.4 shows the percentage of pregnant women with haemoglobin (Hb) lower than 11.0 grams per decilitre (g/dl), by background characteristics. The results of the 2013 SSMIS show that about four in ten pregnant women (39 percent) are anaemic (Hb concentration levels are below 11.0 g/dl) lower than the prevalence of 46 percent reported in the 2009 MIS. Twenty-one percent are mildly anaemic (Hb levels of 10.0-10.9 g/dl), 17 percent are moderately anaemic (Hb levels of 8.0-9.9 g/dl), and only 2 percent are severely anaemic (Hb levels below 8.0 g/dl). The prevalence of severe anaemia is highest among women of Equatorial region (4 percent) compared with other regions.

Prevalence of any anaemia is highest among rural women (40 percent), those from Upper Nile and Bahr el Ghazel (41 percent) and women in the second lowest wealth quintile (44 percent).

Table 5.4: Prevalence of anemia in Pregnant Women

Percentage of pregnant women classified as having anemia, by background characteristics, South Sudan MIS, 2013

	Anaemia Status by hemoglobin level				
Background characteristic	**Mild** (10.0-10.9 g/dl)	**Moderate** (8.0-8.9 g/dl)	**Severe** (Below 8.0 g/dl)	**Any Anemia**	**Number of Women**
Residence					
Rural	20.6	17.1	2.4	40.0	340
Urban	20.5	14.5	1.5	36.2	69
Region					
Upper Nile	18.4	20.0	2.4	40.8	124
Bahr el Ghazal	18.4	16.3	1.4	36.2	141
Equatorial	24.5	14.0	3.8	41.3	144
Wealth index					
Poorest	24.4	17.8	2.2	44.4	88
Second	23.5	24.7	1.2	49.4	81
Middle	11.9	14.9	6.0	32.8	68
Fourth	17.9	16.7	0.0	34.5	84
Richest	23.0	9.2	2.3	34.5	88
Total	**20.5**	**16.6**	**2.2**	**39.4**	**409**

5.1.3 Malaria Prevalence among Children

Malaria prevalence among children age 0-59 months was measured in the 2013 SSMIS in two ways. In the field, laboratory technician used the rapid diagnostic blood test (RDT) to determine whether children had malaria; blood was obtained from finger- or heel-prick samples. Children with positive RDT results were offered antimalarial treatment according to the malaria treatment protocol in South Sudan. In addition, thin and thick smears from each child's blood were made in the field, dried in a dust-free environment, stored in slide boxes, and transported to the laboratory at Juba University Teaching Hospital, for confirmatory microscopy testing.

Table 5.5 shows the results of both malaria tests (RDT and microscopy) among children age 6-59 months by background characteristics. Data show that malaria prevalence is higher with RDTs than with microscopy. This is expected because false positive test results are possible with RDTs.

Table 5.5 shows that 30 percent of children age 0-59 months tested positive for malaria when Rapid Diagnostic Test was used for testing showing an increase from 25 percent reported in the 2009 MIS. Using microscopy, the prevalence of malaria for children was 13 percent which is almost similar to 14 percent reported in the 2009 MIS using the same test. Malaria prevalence increases with the age of the child regardless of the test used. For example using RDT, the prevalence of malaria among children less than

one year is half that of children 48-59 months (17 vs 34 percent). Also, there is little difference in malaria prevalence by sex of the child (31 percent for males compared with 29 percent for females).

Prevalence of malaria is much higher in rural than in urban areas. For example, malaria prevalence using microscopy is 9 percent in urban areas compared with 14 percent in rural areas. Among regions, it ranges from 11 percent in Upper Nile to 53 percent in Equatorial region for RDT and 4 percent for Upper Nile to 25 percent for Equatorial region using microscopy. Malaria prevalence is very high in the Upper wealth quintiles both using RDT and microscopy.

Table 5.5: Prevalence of malaria in children

Percentage of children age 0-59 months classified as having malaria, by background characteristics, South Sudan MIS 2013

Background characteristic	RDT Positive	Number of children	Microscopy	Number of children
Age (in years)				
<1	16.9	284	9.4	256
1	26.2	534	11.3	487
2	31.0	651	14.3	603
3	32.9	751	13.2	697
4	34.2	702	15.4	654
Residence				
Rural	32.1	2,385	14.3	2,186
Urban	20.7	537	8.8	511
Sex				
Male	31.0	1,515	13.6	1,405
Female	28.9	1,407	12.9	1,292
Region				
Upper Nile	10.6	898	4.3	860
Bahr el Ghazal	23.2	991	9.4	898
Equatorial	53.4	1,033	25.2	939
Wealth index				
Poorest	32.7	593	14.0	529
Second	23.2	546	10.1	505
Middle	18.9	470	10.7	440
Fourth	33.7	644	14.8	593
Richest	37.4	669	15.6	630
Total	**30.0**	**2,922**	**13.3**	**2,697**

Figure 5.2 shows the trend in Malaria prevalence for children under 5 years using RDT. The results show that there has been an increase in the prevalence using RDT in South Sudan from 25 percent in 2009 to 30 percent in 2013. Considering regions, there is an increase in Upper Nile region from 8 to 11 percent and an increase from 16 to 23 percent in Bahr el Ghazel while in Equatorial region, the increase was from 48 to 53 percent.

Figure 5.2 Trend in Prevalence of Malaria using RDT in Children Under 5 Years, 2009-2013

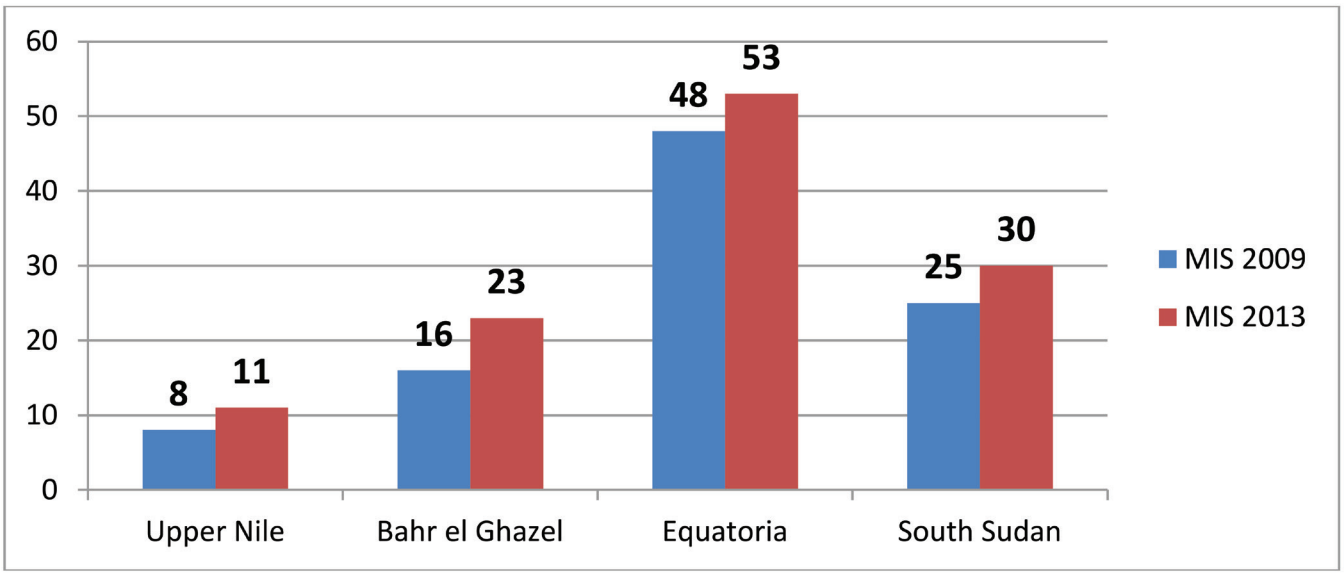
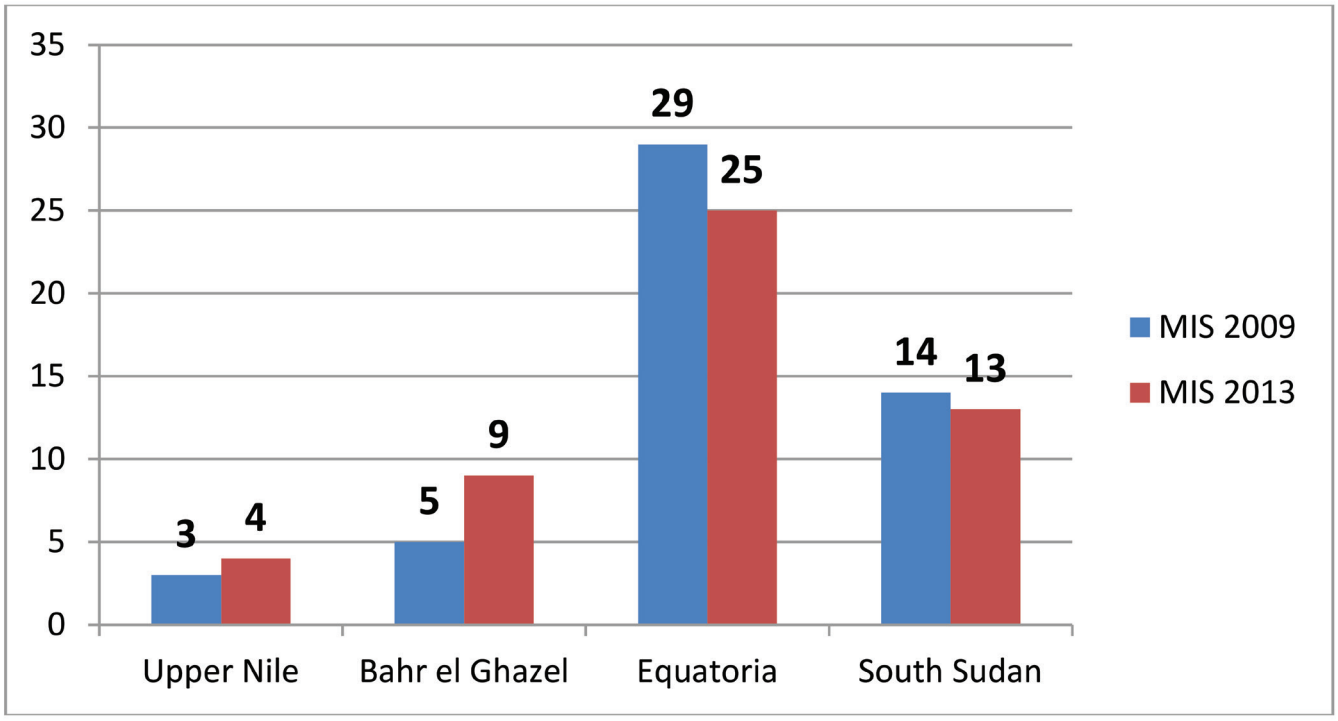


Figure 5.3 shows the trend in Malaria prevalence for children under 5 years using microscopy. The results show that there has been almost no change in the prevalence using RDT in South Sudan from 14 percent vs 13 percent in 2013. Considering regions, there is almost no change in Upper Nile region 3 vs 4 percent and an increase from 5 to 9 percent in Bahr el Ghazel while in Equatorial region, there was a decrease from 29 to 25 percent.

Figure 5.3 Trend in Prevalence of Malaria using Microscopy in Children Under 5 Years, 2009-2013



5.1.4 Malaria Prevalence among Pregnant Women

Table 5.6 shows the results of malaria tests (both RDT and Microscopy) for pregnant women by background

characteristics. The results show that 15 percent of the pregnant women interviewed tested positive for malaria using RDT an increase from 10 percent reported in the 2009 MIS while 9 percent tested positive using microscopy tests which is exactly similar to the reported in the 2009 MIS. Malaria prevalence is higher in rural areas than in urban areas in both tests (16 vs. 12 percent for RDT and 9 vs 4 percent for microscopy) and is highest in the Equatorial region (23 percent for RDT and 15 percent microscopy) and lowest in Bahr el Ghazel for microscopy (4 percent) while for RDT is lowest for Upper Nile (6 percent). There is no special trend depicted as far as the prevalence and the wealth of households of pregnant women is concerned.

Table 5.6: Prevalence of malaria in Pregnant women

Percentage of pregnant women classified as having malaria, by background characteristics, South Sudan MIS 2013

Background characteristic	RDT Positive	Number of Women	Microscopy	Number of Women
Residence				
Rural	16.0	331	9.3	331
Urban	11.6	69	4.4	69
Region				
Upper Nile	5.8	124	5.8	124
Bahr el Ghazal	15.3	141	4.4	141
Equatorial	23.1	144	14.7	144
Wealth index				
Poorest	10.3	87	11.2	87
Second	21.8	78	9.0	78
Middle	9.5	63	6.4	63
Fourth	20.2	84	8.4	84
Richest	13.6	88	6.8	88
Total	**15.3**	**400**	**8.5**	**400**

5.1.5 Malaria Parasite Species

The blood collected was also tested to determine the type of Plasmodium parasite found in children and pregnant women with positive thick smears. Table 5.7 shows the prevalence of Plasmodium species in children age 0–59 months and pregnant women and the percentage with mixed infections by both residence and region.

Ninety-three percent of infected children and pregnant women had Plasmodium falciparum which is almost similar to what was found in the 2009 MIS (94 percent), less than one percent had P. vivax while over a half (54 percent) had P. malariae. Less than one percent had P. ovale species. P. Malariae species were seen most in Equatorial region (60%) as compared to other regions. No P.vivax and P. ovale species were found in Equatoria and Upper Nile.

Table 5.7. Malaria species

Percentage of eligible children age 0-59 months and pregnant women with malaria parasites, and among those, percentage with different species of plasmodium by residence, South Sudan MIS 2013

Background characteristic	P. *falciparum*	P.*vivax*	P. *malariae*	*P.Ovale*	Number of Women/children with malaria parasite
Residence					
Rural	92.2	0.0	53.8	0.0	344
Urban	100.0	2.1	58.3	2.1	48
Region					
Upper Nile	100.0	0.0	54,6	0.0	44
Bahr el Ghazal	69.7	1.1	39.3	1.1	89
Equatorial	100.0	0.0	59.5	0.0	259
Total	**93.1**	**0.3**	**54.3**	**0.3**	**392**

DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS 6

Since the last MIS was conducted in 2009, the malaria programme in South Sudan has made efforts to scale up malaria control interventions to universal coverage in line with global targets for malaria control and elimination. Improving access to treatment through community based approach of home management of malaria using recommended ACTs, universal coverage with LLINs; and a move from presumptive treatment of fever among children under five to parasitological diagnosis-based treatment of malaria among all age groups. Other significant actions have been the training of health workers on malaria diagnosis and treatment in both the public and the private sectors with a focus on behaviour change to diagnosis-based treatment of malaria; and the strengthening of laboratory systems.

The National Malaria Control Programme also undertook a comprehensive programme review in 2013 with the aim of evaluating the performance of the programme and reorienting strategies for malaria control. The 2013 SSMIS was conducted from October to November 2013, the period of peak malaria transmission season in the country. The objective was to determine the status of various key malaria prevention interventions such as bed net coverage and use, coverage of IPTp, access to prompt treatment for children under five years with fever, and the impact of these interventions on the prevalence of malaria and anaemia since the last MIS in 2009.

6.1 IMPACT OF MALARIA INTERVENTIONS

According to this MIS, the Equatorial region has the highest prevalence of malaria for children under 5 using microscopy, (25 per cent), while the prevalence in the rest of the regions is less than 10 per cent. Similarly for pregnant women, malaria prevalence using microscopy was highest in Equatorial region (15 percent) while the prevalence in Upper Nile and Bahr el Ghazel range from 4 to 6 percent. In general, malaria parasite prevalence has more or less remained the same since the last survey for both children under 5 and pregnant women. Overall malaria prevalence using microscopy for children under 5 was 13 percent compared to 14 percent in 2009 while for pregnant women using the same test the prevalence was 9 percent in both surveys.

Essentially, the investment in malaria prevention and control in South Sudan has had very little impact. Malaria endemic zones, in particular the Equatorial region, had a slight reduction in prevalence for children under 5 from 29 percent in 2009 to 25 percent using microscopy, while for the other regions, Upper Nile and Bahr el Ghazel, there was an increase in prevalence over the two survey periods. With efforts geared towards achieving universal ITN coverage in the endemic and highland epidemic prone areas, it is likely that with time the entire country will gradually be an area of very low transmission and the population will become susceptible to epidemics of malaria. It is therefore important to invest in surveillance to provide timely information for malaria epidemic prediction, detection and response. This can be achieved in the context of implementation of the electronic medical records component of the district health information system.

6.2 VECTOR CONTROL WITH ITNs/LLINs

Vector Control in South Sudan is largely LLIN based with limited use of Indoor Residual Spraying (IRS) and Larviciding. In the late 70s and early 80s IRS and Larviciding were implemented by the local Vector Control Units to prevent malaria transmission in and around the major towns and municipalities. Since the successful pilot of mass LLIN distributions in the three states of Warrap, Western Bahe el Ghazel and Western Equatoria in 2008, mass distribution campaigns of free LLINs have been done in all states countrywide with support from partners. In the Republic of South Sudan, the WHO-led IVM strategy has been adopted as the main approach for vector control. At the time of the survey, slightly over 9 million LLINs had been distributed though some of these were no longer deemed protective of the entire population.

The results from the survey show an increase in the ownership of ITNs by households from 53 percent in 2009 to 66 percent. Distribution of ITNs has targeted vulnerable groups like pregnant women and children less than five years of age. Net use among those living in households with at least one ITN is 63 per cent, with the highest use in these households by pregnant women (73 percent) followed by children under five years (66 percent). There is a significant correlation between the number of nets in a household and net use as evidenced by other studies (Eisele et al., 2009). There is still a significant gap between coverage and net use; however, indicating a need for sustained advocacy campaigns that address specific challenges to consistent net use.

6.3 ACCESS TO MALARIA TREATMENT

Prompt access to malaria treatment is essential for the prevention of severe malaria-related illness and death. To ensure effective treatment of malaria, the Republic of South Sudan has updated the national treatment policy to include Artemisinin based Combination Therapies (ACTs), highly efficacious medicines for the treatment of uncomplicated malaria. These services are offered through the Primary Health Care Units, Primary Health Care Centres and Hospitals operated by the ministry of health and INGOs. Services are also being accessed at the private health facilities or drugs being purchased over the counter.

The recommendation is that all patients with fever be tested for malaria and if positive treated with ACTs. The proportion of children under five with fever treated with an ACT reduced from 35 per cent in 2009 to 31 per cent in 2013, with those receiving prompt treatment with ACTs increasing from 11 per cent in 2009 to 17 per cent in 2013. Children with fever in the lowest wealth quintile (74 per cent) are more likely than their wealthier counterparts (55 per cent) to seek care from the public sector.

There are still some children with fever who reported taking non-recommended malaria medicines such as SP and chloroquine. There is a need to strengthen pharmaco vigilance and post-market surveillance activities.

6.4 MALARIA DIAGNOSIS

Traditionally, the number of children with a history of fever has been used as the denominator

for evaluating prompt access to malaria treatment, presenting a challenge with setting targets for this indicator. The ideal denominator would be children with malaria confirmed by testing. Currently treatment of malaria is largely based on clinical diagnosis as only 40% of the health facilities have capacity to perform a malaria diagnostic test. Malaria testing is not easy to evaluate in a cross-sectional survey and in this MIS, a history of a heel or finger prick for collection of a blood sample was used as a proxy for malaria testing.

Overall, only 28 per cent of children under five with fever reported having had a finger or heel prick which is almost similar to the figure reported in the 2009 MIS (27 percent). Parasite prevalence in the Equatorial region using RDT was 53 percent; it was more than double the prevalence in Bahr el Ghazel (23 percent) and almost five times the prevalence in Upper Nile (11 percent). In low prevalence areas, fever cases presenting in these epidemiological zones are not likely to be due to malaria. Thus in these regions, diagnosis-based treatment becomes critical so that other causes of febrile morbidity can be adequately addressed in order to reduce severe illness and death from these causes.

The prevalence of severe anaemia (Hb <8g/dl) in children 6–59 months is 8 percent and that of moderate anaemia (Hb 8–11g/dl) is 22 percent. The Equatorial region, which has the highest malaria prevalence, has a severe anaemia prevalence of 8 percent and moderate anaemia prevalence of 23 percent. The survey also found that the prevalence of anaemia decreases with age for those aged over 12 months and above and that malaria prevalence increases with age.

6.5 CONCLUSION AND RECOMMENDATIONS

According to the 2013 MIS, the prevalence of malaria in children less than five years using microscopy almost remained unchanged (14 per cent in 2009 to 13 per cent in 2013). Among the pregnant women, the Equatorial region has the highest prevalence of 25 percent, while the prevalence in the rest of the regions is less than 10 percent. The household ownership of ITNs increased from 53 percent in 2009 to 66 percent in 2013 while use of ITNs also increased for all groups especially children under 5 and pregnant women. There is need to scale up ITN coverage to the target of one net for two persons at risk and to re-evaluate net use campaigns with a view of scaling up their intensity to address specific issues that impede the use of the nets.

Overall, parasitological diagnosis of malaria is still low. Strong advocacy and information campaigns for both communities and health workers are needed to create demand and change behaviour towards malaria testing for all age groups, especially in areas where malaria prevalence is low. There is need to scale up community case management of malaria to address inequality in prompt access to treatment of malaria. Improving and sustaining malaria communications campaigns are also essential, using effective channels to improve knowledge about the recommended malaria treatment in the community.

Finally, as these and other survey results continue to show, girls' education cannot be overemphasized. Better educated mothers are more likely to attend ANC, to know causes and ways to avoid malaria, know drugs to take when one has malaria and take malarial prevention treatment.

REFERENCES

Southern Sudan 2009 Malaria Indicator Survey Report

Ministry of Health, Republic of South Sudan, South Sudan Malaria Control Strategic Plan 2006-2013.

WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation. 2004. *Meeting on the MDG drinking water and sanitation target: A mid-term assessment of progress. New York:* World Health Organization and United Nations Children's Fund.

National Population Commission (NPC) [Nigeria], National Malaria Control Programme (NMCP) [Nigeria], and ICF International. 2012. *Nigeria Malaria Indicator Survey 2010.* Abuja, Nigeria: NPC, NMCP, and ICF International.

World Health Organization (WHO). 2013. Geneva, Switzerland: WHO. World malaria report

Division of Malaria Control [Ministry of Public Health and Sanitation], Kenya National Bureau of Statistics, and ICF Macro. 2011. 2010 Kenya Malaria Indicator Survey. Nairobi, Kenya: DOMC, KNBS and ICF Macro.

South Sudan Malaria Program Review Report, June 2013

National Malaria Control Programme (NMCP) [Malawi] and ICF International. 2012. *Malawi Malaria Indicator Survey (MIS) 2012.* Lilongwe, Malawi, and Calverton, Maryland, USA: NMCP and ICF International.

World Population Review, South Sudan Population Projection 2014

Eisele, T.P., J. Keating, M. Littrell, D. Larsen, K. Macintyre, 2009. "Assessment of Insecticidetreated bednet use among children and pregnant women across 15 countries using standardized national surveys". *Am J Trop Med Hyg,* 80: 209–14.

APPENDIX I - SUMMARY OF INDICATORS –

MALARIA INDICATOR SURVEY 2013 COMPARING WITH 2009

Indicator		2013	2009
Ownership of any Mosquito Net by Households	South Sudan	69.8	59.3
	Upper Nile	72.3	53.7
	Bahr el Ghazal	73.6	69.0
	Equatorial	63.2	55.9
Ownership of ITNs by Households	South Sudan	66.1	53.2
	Upper Nile	69.5	42.5
	Bahr el Ghazal	69.6	64.6
	Equatorial	59.3	53.0
Percentage of households with at least one net for every two people	South Sudan	28.4	24.6
	Upper Nile	35.0	20.6
	Bahr el Ghazal	24.4	30.1
	Equatorial	26.1	23.5
Percentage of children under 5 years who slept under an ITN in all households	South Sudan	45.8	25.3
	Upper Nile	54.4	24.3
	Bahr el Ghazal	46.6	25.7
	Equatorial	37.2	26.2
Percentage of pregnant women who slept under an ITN in all households	South Sudan	49.5	35.9
	Upper Nile	52.7	27.5
	Bahr el Ghazal	57.1	38.9
	Equatorial	39.2	40.1
Proportion of women who took any anti malarial drugs during pregnancy	South Sudan	54.3	43.7
	Upper Nile	57.8	32.6
	Bahr el Ghazal	49.6	36.9
	Equatorial	55.3	55.9
Proportion of women who took two doses of SP Fansidar	South Sudan	32.2	17.5
	Upper Nile	39.7	15.3
	Bahr el Ghazal	27.3	16.9
	Equatorial	39.9	20.2
Percentage who received 2+ doses of SP Fansidar, at least one of which was during an ANC visit	South Sudan	25.8	12.9
	Upper Nile	30.7	9.1
	Bahr el Ghazal	22.7	12.0
	Equatorial	24.3	17.4
Women who visited a health professional during pregnancy	South Sudan	61.9	55.0
	Upper Nile	63.9	38.3
	Bahr el Ghazal	56.6	48.0
	Equatorial	65.3	67.8

Proportion of women who know that mosquitoes cause malaria	South Sudan	60.8	58.0
	Upper Nile	70.8	53.3
	Bahr el Ghazal	50.8	60.4
	Equatorial	60.6	60.2
Proportion of women who know any ways to avoid malaria	South Sudan	64.4	66.0
	Upper Nile	73.4	63.6
	Bahr el Ghazal	52.8	67.0
	Equatorial	66.1	67.5
Proportion of women who know the right drug to take when one gets malaria	South Sudan	41.1	41.3
	Upper Nile	44.6	43.9
	Bahr el Ghazal	26.9	34.1
	Equatorial	49.8	44.7
Percentage of children who had fever in the last two weeks preceding the survey	South Sudan	44.9	35.0
	Upper Nile	33.8	30.1
	Bahr el Ghazal	35.7	19.1
	Equatorial	62.6	52.3
Percentage of children who sought advice from a health provider	South Sudan	56.8	52.0
	Upper Nile	60.7	38.0
	Bahr el Ghazal	50.4	37.1
	Equatorial	58.4	64.8
Percentage of children who had blood taken from finger or heel for testing	South Sudan	27.6	27.2
	Upper Nile	31.3	19.5
	Bahr el Ghazal	15.0	15.2
	Equatorial	32.4	35.4
Percentage of children who took any drugs for the fever	South Sudan	53.7	52.1
	Upper Nile	55.6	37.2
	Bahr el Ghazal	40.1	33.1
	Equatorial	61.0	66.3
Percentage of children who took anti-malarial drugs when they had a fever	South Sudan	31.9	35.8
	Upper Nile	29.3	24.6
	Bahr el Ghazal	18.9	16.6
	Equatorial	39.8	48.0
Percentage of children who took anti-malarial drugs same or next day	South Sudan	17.2	11.4
	Upper Nile	10.5	2.3
	Bahr el Ghazal	10.6	0.5
	Equatorial	23.9	20.2
Percentage of children under 5 years who are severely anaemic	South Sudan	7.8	11.2
	Upper Nile	7.3	12.9
	Bahr el Ghazal	8.3	10.2
	Equatorial	7.8	10.1

Percentage of Pregnant Women who are severely anaemic	South Sudan	2.2	4.0
	Upper Nile	2.4	4.2
	Bahr el Ghazal	1.4	4.8
	Equatorial	3.8	2.6
Percentagr of children under 5 with any anaemia (mild, moderate or severe)	South Sudan	53.5	64.2
	Upper Nile	55.8	66.7
	Bahr el Ghazal	53.7	59.3
	Equatorial	51.0	65.1
Percentage of Pregnant Women with any anaemia (mild, moderate or severe)	South Sudan	39.4	44.8
	Upper Nile	40.8	44.0
	Bahr el Ghazal	36.2	49.2
	Equatorial	41.3	42.8
Percentage of Children under 5 years who are RDT positive	South Sudan	30.0	24.5
	Upper Nile	10.6	7.8
	Bahr el Ghazal	23.2	16.1
	Equatorial	53.4	47.7
Percentage of Pregnant Women who are RDT positive	South Sudan	15.3	9.9
	Upper Nile	5.8	8.9
	Bahr el Ghazal	15.3	6.4
	Equatorial	23.1	15.2
Percentage of Children under 5 years who are positive using microscopy	South Sudan	13.3	14.2
	Upper Nile	4.3	2.9
	Bahr el Ghazal	9.4	4.8
	Equatorial	25.2	29.3
Percentage of pregnant women who are positive using microscopy	South Sudan	8.5	8.5
	Upper Nile	5.8	1.1
	Bahr el Ghazal	4.4	8.2
	Equatorial	14.7	14.4

APPENDIX II - SURVEY PERSONNEL

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10	Clement James	Laboratory Technician
11	Nadia Elias	Laboratory Technician
12	Moses Batali Lino	Interviewer
13	Samuel Sebit	Interviewer
14	Nancy Poni	Interviewer
15	Tongu Richard	Interviewer
16	Suzan Victor	Interviewer
17	Godfrey Bidal	Interviewer

2. EASTERN EQUATORIA STATE

S/No	Names	Position
1	Catherine Jurua Otto	Central Supervisor
2	Tobia Magezi Omal	State Supervisor
3	Arob Daniel	Field Supervisor
4	Omene Dosolina Degol	Field Supervisor
5	Tokwaro Elias	Field Supervisor
6	Lodofic Toffick	Laboratory Technician
7	Felix Dickson Okum	Laboratory Technician
8	Oroma Alex	Laboratory Technician
9	Elizabeth Bosco	Laboratory Technician
10	Ojara James Loboro	Laboratory Technician
11	Amelia Iliha Eukario	Laboratory Technician
12	Peter Oliech	Interviewer
13	Okumu Francis	Interviewer
14	Okilek Sonia	Interviewer
15	Hidita Joyce Ojok	Interviewer
16	Joseph Oryem Justine	Interviewer
17	Taban James	Interviewer

3. WESTERN EQUATORIA STATE

S/No	Name	Position
1	Towongo Alex	Central Supervisor
2	Emmanuel Francis Badriako	State supervisor
3	Repent Chance Henry	Field Supervisor
4	Victor Diko	Field Supervisor
5	Minor Richard Jauga	Field Supervisor
6	Danstan Adudo Abuk	Laboratory Technician
7	Edward Patrice	Laboratory Technician
8	Nicola Enosa	Laboratory Technician
9	Janity Dawa	Laboratory Technician
10	Zarpha Philip	Laboratory Technician
11	Juwana Clement	Laboratory Technician
12	Joseph Charles	Interviewer
13	Michael Simon	Interviewer
14	Tabitha Fatouma	Interviewer
15	Alfred Anthony	Interviewer
16	Luka Harun	Interviewer
17	Nyama Alex	Interviewer

4. JONGLEI STATE

S/No	Name	Position
1	Bakhit Sabit Saleh	Central Supervisor
2	Moses Dhanojak Obongo	State Supervisor
3	Joseph Ojulo Adwange	Field Supervisor
4	Yoal Tot Nyuot	Field Supervisor
5	Aloung Magok Thoing	Field Supervisor
6	Emmanuel Char Chot	Laboratory Technician
7	Yuhana Panchol	Laboratory Technician
8	Simon Nyok Mac	Laboratory Technician
9	Arok Ngong Joseph	Laboratory Technician
10	Ateny Phillip Kon	Laboratory Technician
11	Majak Duang Kut	Laboratory Technician
12	Gatluak Kuol Gany	Interviewer
13	Simon Kher Jal	Interviewer
14	Diing Mabil	Interviewer
15	Wello Ochalla Oman	Interviewer
16	Phillip Mamer Chaar	Interviewer
17	Isaiah Okony Ochan	Interviewer

5. UPPER NILE STATE

S/No	Name	Position
1	Constantino Doggale	Central Supervisor
2	Peter Akutok	State Supervisor
3	Oman Olwack	Field Supervisor
4	Zakaria Akwoc Keir	Field Supervisor
5	Philip Mobil Lual	Field Supervisor
6	Martha Akuon Deng	Laboratory Technician
7	Rebecca Kudit	Laboratory Technician
8	Maki Kuol Pal	Laboratory Technician
9	Gwokpan Awin Nykmol	Laboratory Technician
10	Mariana Silvio Ajing	Laboratory Technician
11	Stella Peter Oganjowak	Laboratory Technician
12	Pio Gabriel	Interviewer
13	James Gatthack	Interviewer
14	Peter Joseph Deng	Interviewer
15	Akim Gatluak Thach	Interviewer
16	Tharjiath Tongyik	Interviewer
17	Bol Peter Abwol	Interviewer

6. UNITY STATE

S/No	Name	Position
1	John Garnag Akot Bior	Central Supervisor
2	Kuejien Gathok Jossy	State Supervisor
3	Chuol Toang Duoth	Field Supervisor
4	James Kuol Tieriet	Field Supervisor
5	David Yak Kuic	Laboratory Technician
6	Peter Mayom Yak	Laboratory Technician
7	Samuel Majak Gatwich	Laboratory Technician
8	Samuel Keah Riek	Laboratory Technician
9	Santino Majok Achuil	Interviewer
10	Arang Manyial	Interviewer
11	James Nyanya Pual	Interviewer
12	Bany Makon Chany	Interviewer

7. WARRAP STATE

S/No	Name	Position
1	Lea Muja	Central Supervisor
2	Nyang Kiir Deng	State Supervisor
3	James Kon Akol	Field Supervisor
4	Gabriel Mabith Malek	Field Supervisor
5	Barac Malith Atem	Field Supervisor
6	Lazarous Atem Ayuel	Laboratory Technician
7	Makuei Wek Ngor	Laboratory Technician
8	Elizabeth Alberto Longoya	Laboratory Technician
9	Clement Manon Kon	Laboratory Technician
10	Mario Mathiang Gur	Laboratory Technician
11	Chan Riing Chan	Laboratory Technician
12	Kolnyin Deng Kolnyin	Interviewer
13	Yak Kiir Madut	Interviewer
14	Zacharia Aguek Machar	Interviewer
15	Santino Makieu Deng	Interviewer
16	Wuol Mawien Agok	Interviewer
17	Mayom Bol Mayom	Interviewer

8. LAKES STATE

S/No	Name	Position
1	Esther Kajija Isdoro	Central Supervisor
2	Permino Saad	State supervisor
3	Moses Ater Nuer	Field Supervisor
4	John Mading	Field Supervisor
5	Isaac Majok	Laboratory technician
6	James Mabor	Laboratory technician
7	Paul Majak	Laboratory technician
8	Daniel Magok	Laboratory technician
9	Martin Kawaja	Interviewer
10	Phillip Kau	Interviewer
11	Manger Peter	Interviewer
12	Samuel Makur	Interviewer

9. WESTERN BAHR EL GHAZAL STATE

S/No	Name	Position
1	Dr. Martina Constantine Jervase	Central Supervisor
2	Abdelgadir Mudwok Acuil	State Supervisor
3	John Baptist Abaker	Field Supervisor
4	Johnson John Mambia	Laboratory technician
5	Ehlam Abdel Aziz	Laboratory technician
6	Juma Bai Wandu	Interviewer
7	Emmanuel Eugieno	Interviewer

10. NORTHERN BAHR EL GHAZAL STATE

S/No	Name	Position
1	Simon James Aban	Central Supervisor
2	Victoria Reec Kuol	State Supervisor
3	Simon Malou Malou	Field Supervisor
4	Zakaria Mayuol Deng	Field Supervisor
5	Simon Mapat Marol	Laboratory Technician
6	James Akot Garang	Laboratory Technician
7	Daniel Kuac Atuer	Laboratory Technician
8	Lino Lual Dau	Laboratory Technician
9	Marko Kawac Dhieu	Interviewer
10	Ngor John Ngor	Interviewer
11	Angelo Kur Akot	Interviewer
12	Santino Thiepteen Lual	Interviewer

Data Processing Staff

S/No	Name	Position
1	Richard Ambayo Kamilo	National Consultant
2	Victor Misaka	Supervisor
3	Gordon Wani	Supervisor / Administrator
4	John Kenyi Alfred	Questionnaire verifier
5	Samson Sebit	Questionnaire verifier
6	Joyce Guido	Support staff
7	Sejerina Jambili	Support staff

Data Entry Clerks

S/No	Name	Position
1	Acayo Alice Lupo	Data Entry Clerk
2	Barnaba Lado Michael	Data Entry Clerk
3	Bol Gabriel Ajok	Data Entry Clerk
4	Clara Obuti Lawrence	Data Entry Clerk
5	Deng Aluak Deng	Data Entry Clerk
6	Enike Poni Eliaba	Data Entry Clerk
7	Frederick Oduho Orlando Okiling	Data Entry Clerk
8	Johnson Mawat Maker	Data Entry Clerk
9	Juwa Isaac Jangara	Data Entry Clerk
10	Khot Gabriel Deng	Data Entry Clerk
11	Lalam Lucy Moro	Data Entry Clerk
12	Lamunu Jackline Lukwiya	Data Entry Clerk
13	Lina Pasquale Clement	Data Entry Clerk
14	Lomundu Denis Sokiri Reuben	Data Entry Clerk
15	Mabil Mading Agok	Data Entry Clerk
16	Mary Karanye Onesimo	Data Entry Clerk
17	Saeed Moses Riro Juac	Data Entry Clerk
18	Sarah Nyankueth Malek	Data Entry Clerk
19	Sijali Harun	Data Entry Clerk
20	Vesxion Benison Kayanga	Data Entry Clerk

Slide Readers

S/No	Name	Position
1	Gregory Wani Dumo	Overall Supervisor
2	Charles Stanley Mazinda	Supervisor
3	Wilma Rahma David	Slide Reader
4	Weki Wayo Joseph Agumeringo	Slide Reader
5	Clement Koma Dosteo	Slide Reader
6	Hillary Loku Wani	Slide Reader
7	Charity Ritti Jada	Slide Reader
8	Ferida Mikaya Mondi	Slide Reader

APPENDIX III – QUESTIONNAIRES

Serial Number | | | | | | | | | | | | | | |

Line numbers of all eligible women within this household who answered women's questionnaires:

(Then tuck completed women's questionnaires

within HH questionnaire)

Malaria Indicator Survey
South Sudan

Household Questionnaire

October 2013

IDENTIFICATION

(Complete at start of interview using information from EA maps)

REGION	☐
STATE	☐☐
COUNTY	☐☐
PAYAM	☐☐
BOMA	☐☐
ENUMERATION AREA (EA)	☐☐☐
HOUSEHOLD NUMBER	☐☐☐
HOUSEHOLD COORDINATES	☐☐☐
TELEPHONE CONTACT	N _ _ . _ _ _ _ _ ° E _ _ _ . _ _ _ _ _ °

INTERVIEWER VISITS (Complete at end of interview)

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY ☐☐
INTERVIEWER'S NAME	_____	_____	_____	MONTH ☐☐
INTERVIEWER'S CODE	_____	_____	_____	YEAR ☐☐☐☐
RESULT*	_____	_____	_____	TIME __ __ : __ __
				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 Houshold ☐☐

Total Eligible Women ☐☐

Line Number of Respondent to Household Questionnaire ☐☐

Supervisor	Office Editor	Keyed by
NAME _____		
DATE _____ ☐☐	☐☐	☐☐

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working with MOH/RSS. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will be very valuable in helping to reduce the burden of malaria in the country. The interview will take around 30 to 40 minutes to complete.

We would then like to interview all women aged 15-49 years in the household and take blood samples (using a finger prick) from children under five and pregnant women.

All information will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

IF PERMISSION IS GIVEN, BEGIN THE INTERVIEW AFTER FILLING THE PRESENT PAGE. IF THE PERSON REFUSES, PLEASE NOTIFY YOUR SUPERVISOR

Respondent name: _____

Date: _____ (DD/MM/YYY)

Signature: _____or Right thumb print:

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

SECTION 1: 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	RELATION-SHIP TO HEAD OF HOUSE-HOLD	SEX	RESIDENCE		AGE		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 house-hold?*	Is (NAME) male or female? Male=1 Female=2	Does (NAME) usually live here? Yes=1 No=2	Did (NAME) stay here last night? Yes=1 No=2	How old is (NAME)? If aged above one year, complete number of years and enter 00 in months. If aged below one year, enter 00 years and number of completed months. If less than one month, enter 00 months.		CIRCLE LINE NUMBER OF ALL WOMEN AGE 1549
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
01 (HEAD OF HOUSEHOLD)		0 1				IN YEARS	IN MONTHS	01
02						IN YEARS	IN MONTHS	02
03						IN YEARS	IN MONTHS	03
04						IN YEARS	IN MONTHS	04
05						IN YEARS	IN MONTHS	05
06						IN YEARS	IN MONTHS	06
07						IN YEARS	IN MONTHS	07
08						IN YEARS	IN MONTHS	08
09						IN YEARS	IN MONTHS	09
10						IN YEARS	IN MONTHS	10

* 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 = NIECE / NEPHEW
10 = ADOPTED / FOSTER / STEPCHILD
11 = OTHER
12 = NOT RELATED
98 = DON'T KNOW

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATION-SHIP TO HEAD OF HOUSEHOLD	SEX	RESI-DENCE		AGE		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? Male=1 Female=2	Does (NAME) usually live here? Yes=1 No=2	Did (NAME) stay here last night? Yes=1 No=2	How old is (NAME)? If aged above one year, complete number of years and enter 00 in months. If aged below one year, enter 00 years and number of completed months.		CIRCLE LINE NUMBER OF ALL WOMEN AGE 1549
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
11						IN YEARS	IN MONTHS	11
12						IN YEARS	IN MONTHS	12
13						IN YEARS	IN MONTHS	13
14						IN YEARS	IN MONTHS	14
15						IN YEARS	IN MONTHS	15
16						IN YEARS	IN MONTHS	16
17						IN YEARS	IN MONTHS	17
18						IN YEARS	IN MONTHS	18
19						IN YEARS	IN MONTHS	19
20						IN YEARS	IN MONTHS	20

TICK HERE IF CONTINUATION SHEET USED (IE. IF MORE THAN 20 PERSONS IN HOUSEHOLD)						
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 servants, 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	

SECTION 2: SOCIO-ECONOMIC QUESTIONS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
9	What is the main source of drinking water for members of your household? (CIRCLE ONLY ONE RESPONSE)	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)	
10	What kind of toilet facilities does your household mainly use? (INTERVIEWER TO OBSERVE, CIRCLE ONLY ONE RESPONSE)	FLUSH OR POUR FLUSH TOILET PRIVATE FLUSH TOILET.....11 SHARED FLUSH TOILET.....12 PIT LATRINE PRIVATE PIT LATRINE.....21 SHARED PIT LATRINE.....22 COMPOSTING TOILET.....31 BUCKET TOILET.....41 NO FACILITY/BUSH/FIELD.....61 OTHER _____ 96 (SPECIFY)	
11	Does your household have: Electricity? A radio? A television? A telephone (Land Line)? Mobile phone? A refrigerator? A satellite dish? Air conditioner/cooler? A fan? A computer? A generator?	YES NO ELECTRICITY 1 2 RADIO 1 2 TELEVISION 1 2 TELEPHONE (LANDLINE) 1 2 MOBILE PHONE 1 2 REFRIGERATOR 1 2 SATELLITE DISH 1 2 AIR CONDITIONER/COOLER 1 2 FAN 1 2 COMPUTER 1 2 GENERATOR 1 2	
12	Does any member of your household own: A bicycle? A motorcycle or motor scooter? A car or truck? A boat? Animal transport/ cart?	YES NO BICYCLE 1 2 MOTORCYCLE/SCOOTER 1 2 CAR/TRUCK 1 2 BOAT 1 2 ANIMAL TRANSPORT/CART 1 2	
13	What type of fuel does your household mainly use for cooking? (CIRCLE ONLY ONE RESPONSE)	ELECTRICITY.....01 LPG/NATURAL GAS .....02 BIOGAS.....03 KEROSENE/PARAFFIN .....04 CHARCOAL.....06 FIREWOOD .....07 STRAW/GRASS.....08 DUNG.....09 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
14	Do you own any cows, sheep, goats, chickens/ other poultry?	YES .....1 NO 2	<15A
14B	How many of each do you own? RECORD NUMBER OWNED	COWS ..... ☐☐☐☐ SHEEP ..... ☐☐☐☐ GOATS ..... ☐☐☐☐ CHICKENS ..... ☐☐☐☐ OTHER POULTRY ..... ☐☐☐☐	
15A	WHAT TYPE OF DWELLING DOES THIS HOUSE-HOLD MAINLY LIVE IN? (INTERVIEWER TO OBSERVE THE MAIN BUILDING WHERE HEAD STAYS, CIRCLE ONLY ONE RESPONSE)	TENT 11 DWELLING OF STRAW MATS 21 TUKUL/GOTTIYA-MUD 31 TUKUL/GOTTIYA-STICKS 41 FLAT OR APARTMENT 51 VILLA 61 HOUSE OF ONE FLOOR-MUD 71 HOUSE OF ONE FLOOR-BRICK/CONCRETE 81 HOUSE CONSTRUCTED OF WOOD 91 MULTI-STOREY HOUSE 101 INCOMPLETE 111 OTHER _____ 96 (SPECIFY)	
15B	MAIN MATERIAL OF THE HOUSE/TUKUL FLOOR? (INTERVIEWER TO OBSERVE, CIRCLE ONLY ONE RESPONSE)	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)	

SECTION 3: MALARIA QUESTIONS

16A	In the past 12 months, has anyone come into your house and sprayed the interior walls of your dwelling against mosquitoes? (THIS REFERS TO MASS-SPRAYING OF WALLS RATHER THAN INSECTICIDE THAT THE RESPONDENT HAS PURCHASED THEMSELVES. SHOW THE RESPONDENT PICTURES TO CLARIFY)	YES .....1 NO .....2 DON'T KNOW 8	<17
16B	How many months ago was the house sprayed? IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO ..... ☐☐	
16C	Who sprayed the house?	GOVERNMENT WORKER / PROGRAM ..... 1 NGO ..... 2 PRIVATE COMPANY ..... 3 HOUSE HOLD MEMBER ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	

17	Does your household have any mosquito nets that can be used while sleeping?	YES....1 NO....2	→ END
18	How many mosquito nets does your household have?	NUMBER OF NETS .... ☐	

		NET # 1	NET #2	NET #3
19	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, CONTINUE ON PAGE 10; IF MORE THAN SIX USE ADDITIONAL QUESTION-NAIRES	OBSERVED ....1 NOT OBSERVED....2	OBSERVED ....1 NOT OBSERVED....2	OBSERVED ....1 NOT OBSERVED....2
20	How long ago did your household obtain the mosquito net?	☐☐ MONTHS AGO MORE THAN 3 YEARS AGO…….95	☐☐ MONTHS AGO MORE THAN 3 YEARS AGO…….95	☐☐ MONTHS AGO MORE THAN 3 YEARS AGO…….95
21	Where did you obtain the net?	GOV HEALTH FACILITY..... 1 NGO.... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.... 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR.... 6 PHARMACYK.... 7 OTHER ________ 8 (SPECIFY) DON'T KNOW.... 9	GOV HEALTH FACILITY..... 1 NGO.... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.... 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR.... 6 PHARMACYK.... 7 OTHER ________ 8 (SPECIFY) DON'T KNOW.... 9	GOV HEALTH FACILITY..... 1 NGO.... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.... 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR.... 6 PHARMACYK.... 7 OTHER ________ 8 (SPECIFY) DON'T KNOW.... 9
22	Did you purchase the net (ie. pay money for it)?	YES....1 NO....2 (SKIP TO 24) = ________	YES....1 NO....2 (SKIP TO 24) = ________	YES....1 NO....2 (SKIP TO 24) = ________
23	How much did you pay for the net when it was purchased?	☐☐ SSP .... 1 OTHER CURRENCY....2 (SPECIFY)	☐☐ SSP .... 1 OTHER CURRENCY....2 (SPECIFY)	☐☐ SSP .... 1 OTHER CURRENCY....2 (SPECIFY)

		NET # 1	NET #2	NET #3
24	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. LOOK AT LABELS. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	LONG-LASTING (LLIN)' PERMANET....1 OLYSET....2 INTERCEPTOR....3 NET PROTECT....4 DURANET....5 ICONLIFE....6 'PRETREATED NET' SERENA....7 'TREATED DAMURIA'....8 'OTHERS'....31 (SPECIFY) DON'T KNOW BRAND....98	LONG-LASTING (LLIN)' PERMANET....1 OLYSET....2 INTERCEPTOR....3 NET PROTECT....4 DURANET....5 ICONLIFE....6 'PRETREATED NET' SERENA....7 'TREATED DAMURIA'....8 'OTHERS'....31 (SPECIFY) DON'T KNOW BRAND....98	LONG-LASTING (LLIN)' PERMANET....1 OLYSET....2 INTERCEPTOR....3 NET PROTECT....4 DURANET....5 ICONLIFE....6 'PRETREATED NET' SERENA....7 'TREATED DAMURIA'....8 'OTHERS'....31 (SPECIFY) DON'T KNOW BRAND....98
25	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES....1 NO....2 (SKIP TO 27)=_________ NOT SURE....8 (SKIP TO 27)=_________	YES....1 NO....2 (SKIP TO 27)=_________ NOT SURE....8 (SKIP TO 27)=_________	YES....1 NO....2 (SKIP TO 27)=_________ NOT SURE....8 (SKIP TO 27)=_________
26	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.	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98
27	Did anyone sleep under this mosquito net last night?	YES....1 NO....2 (SKIP TO 29)=_________ NOT SURE....8 (SKIP TO 29)=_________	YES....1 NO....2 (SKIP TO 29)=_________ NOT SURE....8 (SKIP TO 29)=_________	YES....1 NO....2 (SKIP TO 29)=_________ NOT SURE....8 (SKIP TO 29)=_________

		NET # 1	NET #2	NET #3
28	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD LISTING. THEN SKIP TO Q30.	NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] (SKIP TO 30) =——<	NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] (SKIP TO 30) =——<	NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] NAME ____________ ____________ LINE NO: [ ][ ] (SKIP TO 30) =——<
29	Why was the net not used last night? CIRCLE ONE OR MORE RESPONSES	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)
30		GO BACK TO 19 FOR NEXT NET; OR, IF NO MORE NETS, GO TO Q31 IF CHILDREN UNDER 5, IF NONE, END QUESTIONNAIRE.	GO BACK TO 19 FOR NEXT NET; OR, IF NO MORE NETS, GO TO Q31 IF CHILDREN UNDER 5, IF NONE, END QUESTIONNAIRE.	GO BACK TO 19 IN THE FIRST COLUMN OF NEW PAGE; OR, IF NO MORE NETS, GO TO Q31 IF CHILDREN UNDER 5, IF NONE, END QUESTIONNAIRE.

		NET # 1	NET #2	NET #3
19	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, CONTINUE ON PAGE 10; IF MORE THAN SIX USE ADDITIONAL QUESTION-NAIRES	OBSERVED ....1 NOT OBSERVED.....................2	OBSERVED ....1 NOT OBSERVED.....................2	OBSERVED ....1 NOT OBSERVED.....................2
20	How long ago did your household obtain the mosquito net?	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO…….95	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO…….95	[ ][ ] MONTHS AGO MORE THAN 3 YEARS AGO…….95
21	Where did you obtain the net?	GOV HEALTH FACILITY..... 1 NGO....................................... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.. 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR............. 6 PHARMACYK....................... 7 OTHER _________________ 8 (SPECIFY) DON'T KNOW....................... 9	GOV HEALTH FACILITY..... 1 NGO....................................... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.. 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR............. 6 PHARMACYK....................... 7 OTHER _________________ 8 (SPECIFY) DON'T KNOW....................... 9	GOV HEALTH FACILITY..... 1 NGO....................................... 2 COMMUNITY BASED DISTRI-BUTION .... 3 COMMUNITY OUTREACH e.g. EPI.. 4 PRIVATE SECTOR SHOP .... 5 MARKET/VENDOR............. 6 PHARMACYK....................... 7 OTHER _________________ 8 (SPECIFY) DON'T KNOW....................... 9
22	Did you purchase the net (ie. pay money for it)?	YES...1 NO...2 (SKIP TO 24) = _________	YES...1 NO...2 (SKIP TO 24) = _________	YES...1 NO...2 (SKIP TO 24) = _________
23	How much did you pay for the net when it was purchased?	[ ][ ] SSP .... 1 OTHER CURRENCY................2 (SPECIFY)	[ ][ ] SSP .... 1 OTHER CURRENCY................2 (SPECIFY)	[ ][ ] SSP .... 1 OTHER CURRENCY................2 (SPECIFY)
24	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. LOOK AT LABELS. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	LONG-LASTING (LLIN)' PERMANET...........................1 OLYSET ....2 INTERCEPTOR ....3 NET PROTECT......................4 DURANET.............................5 ICONLIFE..............................6 'PRETREATED NET' SERENA................................7 'TREATED DAMURIA'................8 'OTHERS' ....31 (SPECIFY) DON'T KNOW BRAND............98	LONG-LASTING (LLIN)' PERMANET...........................1 OLYSET ....2 INTERCEPTOR ....3 NET PROTECT......................4 DURANET.............................5 ICONLIFE..............................6 'PRETREATED NET' SERENA................................7 'TREATED DAMURIA'................8 'OTHERS' ....31 (SPECIFY) DON'T KNOW BRAND............98	LONG-LASTING (LLIN)' PERMANET...........................1 OLYSET ....2 INTERCEPTOR ....3 NET PROTECT......................4 DURANET.............................5 ICONLIFE..............................6 'PRETREATED NET' SERENA................................7 'TREATED DAMURIA'................8 'OTHERS' ....31 (SPECIFY) DON'T KNOW BRAND............98
25	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES .... 1 NO .... 2 (SKIP TO 27)=_________ NOT SURE.................................... 8 (SKIP TO 27)=_________	YES .... 1 NO .... 2 (SKIP TO 27)=_________ NOT SURE.................................... 8 (SKIP TO 27)=_________	YES .... 1 NO .... 2 (SKIP TO 27)=_________ NOT SURE.................................... 8 (SKIP TO 27)=_________

		NET # 1	NET #2	NET #3
26	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.	MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98	MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98	MONTHS AGO MORE THAN 3 YEARS AGO ....95 NOT SURE 98
27	Did anyone sleep under this mosquito net last night?	YES .... 1 NO .... 2 (SKIP TO 29)=_________ NOT SURE.................................... 8 (SKIP TO 29)=_________	YES .... 1 NO .... 2 (SKIP TO 29)=_________ NOT SURE.................................... 8 (SKIP TO 29)=_________	YES .... 1 NO .... 2 (SKIP TO 29)=_________ NOT SURE.................................... 8 (SKIP TO 29)=_________
28	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD LISTING. THEN SKIP TO Q30.	NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: (SKIP TO 30) =——<	NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: (SKIP TO 30) =——<	NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: NAME ____________________ LINE NO: (SKIP TO 30) =——<

		NET # 1	NET #2	NET #3
29	Why was the net not used last night? CIRCLE ONE OR MORE RESPONSES	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)	NOT HUNG UP .... 1 END OF RAINY SEASON .... 2 PERSON NOT AROUND .... 3 NOT CONSIDERED EFFECTIVE .... 4 TOO HOT .... 5 TOO BIG/SMALL .... 6 HAVE OTHER NETS .... 7 ALLERGIC TO NET .... 8 NET IS DANGEROUS/ POISONOUS .... 9 NO MOSQUITOES .... 10 NO SPACE .... 11 OTHER .... 12 (SPECIFY)
30		GO BACK TO 19 FOR NEXT NET; OR, IF NO MORE NETS, END QUESTIONNAIRE.	GO BACK TO 19 FOR NEXT NET; OR, IF NO MORE NETS, END QUESTIONNAIRE.	GO BACK TO 19 IN THE FIRST COLUMN OF NEW PAGE; OR, IF NO MORE NETS, END QUESTIONNAIRE.

☐ TICK HERE IF CONTINUATION SHEET USED IE. IF MORE THAN 6 NETS IN HH.

END OF HOUSEHOLD QUESTIONNAIRE. PROCEED TO WOMEN'S QUESTIONNAIRE(S). BLOOD COLLECTOR TO THEN COMPLETE SECTION 4 (BLOOD TESTS).

SECTION 4: BLOOD TESTS (CHILDREN UNDER 5 YEARS)

CHECK COLUMN (7) OF HOUSEHOLD LISTING: RECORD THE LINE NUMBER, NAME AND AGE OF ALL CHILDREN UNDER AGE 5. THEN ASK THE DATE OF BIRTH.

CHILDREN UNDER AGE 5 YEARS				BLOOD TESTS		
LINE NUMBER FROM COL. (1) FROM HH QUESTIONNAIRE	NAME FROM COL. (2) FROM HH QUESTIONNAIRE	AGE FROM COL. (7) FROM HH QUESTIONNAIRE	What Is (NAME's) date of birth? COPIES 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 (FROM HH QUESTIONNAIRE) RECORD '00' IF NOT LISTED IN HOUSEHOLD SCHEDULE	READ CONSENT STATEMENT BELOW TO PARENT/ADULT RESPONSIBLE FOR THE CHILD CIRCLE CODE AND SIGN GRANTED = 1 REFUSED = 2	RESULT OF BLOOD TEST 1 MEASURED 2 NOT PRESENT 3 REFUSED 4 OTHER
(31)	(32)	(33)	(34)	(35)	(36)	(37)
			DAY MONTH YEAR		1 SIGN/PRINT _____ 2 NEXT LINE ←	
					1 SIGN/PRINT _____ 2 NEXT LINE ←	
					1 SIGN/PRINT _____ 2 NEXT LINE ←	
					1 SIGN/PRINT _____ 2 NEXT LINE ←	
					1 SIGN/PRINT _____ 2 NEXT LINE ←	
					1 SIGN/PRINT _____ 2 NEXT LINE ←	

TICK HERE IF CONTINUATION SHEET USED IE. IF MORE THAN SIX CHILDREN UNDER 5	CONSENT STATEMENT:As part of this survey, we are studying anaemia and blood parasite levels among children under five and pregnant women. Anaemia is a serious health problem that results from poor nutrition or diseases such as malaria. This survey will assist the government to develop programs to prevent and treat these important health problems. We request that all children under five (born in October 2008 or later) participate in the anaemia and parasitaemia testing part of this survey and give a few drops of blood from a finger. The test uses disposable sterile instruments that are clean and completely safe. The blood will be analysed with new equipment and tested for malaria and anaemia. The results of the test will be given to you right after the blood is taken and treatment provided if necessary. The results will be kept confidential. May I now ask that (NAME OF CHILD[REN]) participate in the blood tests. However, if you decide not to have him/her/them tested, it is your right and we will respect your decision. Now please tell me if you agree to have the test(s) done.

TESTING FOR ANAEMIA / MALARIA

	RESULTS OF BLOOD TEST (ANAEMIA / MALARIA)		TREATMENT PROVIDED	BLOOD SLIDE	
LINE NUMBER FROM COL. (1) COPY FROM PREVI-OUS PAGE	HAEMOGLOBIN LEVEL (ANAEMIA RESULT) (G/DL)	RDT RESULT (MALARIA RESULT) POSITIVE=1 NEGATIVE=2 INVALID=3	TREATMENT (ANAEMIA / MALARIA) (CIRCLE ALL THAT APPLY)	BLOODSLIDE: DONE .... 1 NOT PRESENT .... 2 REFUSED .... 3 OTHERS 4	BLOODSLIDE NUMBER A=THICK SLIDE B=THIN SLIDE COPY NUMBER WRITTEN ON BLOOD SLIDE.
(38)	(39)	(40)	(41)	(42)	(43)
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:
			ASAQ.......... 1 IRON.......... 2 ALBENDAZOLE .... 3 PARACETAMOL .... 4 REFERRED .... 5 REFUSED.......... 6		A: B:

44	CHECK 39: NUMBER OF CHILDREN WITH HAEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE NONE ↓ ↓ GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 45. GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT AND END THE HOUSEHOLD INTERVIEW.
45	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 refer (NAME OF CHILD) to a health facility where he/she can be cared for and treated. We will note the details down on a referral card for you to take with you to the health centre.

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

INTERVIEWER'S OBSERVATIONS

(TO BE FILLED IN AFTER COMPLETING INTERVIEW)

COMMENTS ABOUT RESPONDENT:

_____

_____

_____

_____

_____

COMMENTS ON SPECIFIC QUESTIONS:

_____

_____

_____

_____

_____

ANY OTHER COMMENTS:

_____

_____

_____

SIGNATURE OF INTRVIEWER.....

PHONE.....DATE.....

SUPERVISOR'S BSERVATIONS

_____

_____

_____

_____

_____

_____

NAME OF THE SUPERVISOR:_____ SIGNATURE .....

PHONE..... DATE: _____

Serial Number															

Malaria Indicator Survey
South Sudan

Women's Questionnaire

October 2013

IDENTIFICATION

(Complete at start of interview - same as HH questionaire)

REGION	☐
STATE	☐☐
COUNTY	☐☐
PAYAM	☐☐
BOMA	☐☐☐
ENUMERATION AREA (EA)	☐☐☐
HOUSEHOLD NUMBER	☐☐☐
HOUSEHOLD COORDINATES (FROM GPS).....	N _ _ . _ _ _ _ _ º
NAME OF WOMAN AND LINE NUMBER:.....	E _ _ _ . _ _ _ _ _ º
	☐☐

INTERVIEWER VISITS (Complete at end of interview)

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

*Result codes:
1 Completed
2 Not at home
3 Postponed
4 Refused
5 Partly Completed
6 Incapacitated
7 Others _____
(Specify)

Supervisor	Office Editor	Keyed by
NAME _____		
DATE _____ ☐☐	☐☐	☐☐

INTRODUCTION AND CONSENT

INFORMED CONSENT

TO BE COMPLETED AFTER THE HOUSEHOLD INFORMATION SHEET HAS BEEN READ

Hello. My name is _____ and I am working with MOH/RSS. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will be very valuable in helping to reduce the burden of malaria in the country. The survey will take between half an hour and an hour to complete. The information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

IF PERMISSION IS GIVEN, BEGIN THE INTERVIEW AFTER FILLING THE PRESENT PAGE. IF THE PERSON REFUSES, PLEASE NOTIFY YOUR SUPERVISOR

Respondent name: _____

Date: _____ (DD/MM/YYY)

Signature: _____or Right thumb print:

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

SECTION 1: BACKGROUND QUESTIONS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
102	In what month and year were you born? USE CALENDAR OF EVENTS TO PROMPT RECOLLECTION OF YEAR OF BOTH. ONLY WHEN ABSOLUTELY NECESSARY CIRCLE DON'T KNOW.	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: Elementary, primary, secondary, or higher?	ELEMENTARY.....1 PRIMARY.....2 INTERMEDIATE.....3 SECONDARY .....4 UNIVERSITY.....5 OTHER_____6 (SPECIFY)	
106	What is the highest (grade/form/year) you completed at that level?	GRADE..... | | OTHER _____ (SPECIFY)	
107	CHECK 105: ELEMENTARY/PRIMARY/ INTERMEDIATE/OTHER _____ ↓	☐ SECONDARY AND ABOVE ☐ _____	—<109

108	Can you read and write in any language? ASK RESPONDENT TO READ PART OF TEXT ON QUESTIONNAIRE	CANNOT READ AT ALL ..... 1 ABLE TO READ ONLY PARTS OF SENTENCE 2 ABLE TO READ WHOLE SENTENCE……..... 3 NO TEXT WITH REQUIRED LANGUAGE_____ 4 (SPECIFY) BLIND/VISUALLY IMPAIRED…….. 5 2	
109	What religion are you?	CHRISTIAN.....1 MUSLIM.....2 OTHER _____3 (SPECIFY)	

SECTION 2: REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask you about all the times you have given birth during your life. Have you ever given birth? (PROBE FOR ANY BABY, EVEN IF THEY CRIED AND SHOWED SIGNS OF LIFE, BUT DID NOT SURVIVE)	YES ..... 1 NO 2	—<206
202	Have you given birth to any sons or daughters that are now living with you?	YES ..... 1 NO 2	—<204
203	How many sons or daughters are living with you now? IF NONE, RECORD '00'.	SONS AT HOME ..... DAUGHTERS AT HOME	
204	Are there any children born by you, who do not live with you?	YES ..... 1 NO 2	—<206
205	How many sons or daughters born by you do not live with you IF NONE, RECORD '00'.	SONS ELSWHERE ..... DAUGHTERS ELSWHERE	
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 OF 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	TOTAL NUMBER OF BIRTHS (INCLUDING THOSE THAT LATER DIED) SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF ANSWERED NO TO Q. 201 AND Q. 206 (NO CHILDREN BORN), ENTER 00 IN THE BOXES.	TOTAL	
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 → PRODE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE BIRTH (tick box) → Was this child born in the last five years (since January 2008)? TWO OR MORE BIRTHS (tick box) → How many of these children were born in the last five years (since January 2008)? IF NO CHILDREN BORN IN LAST 5 YEARS, RECORD '00' AND GO TO QUESTION 224	TOTAL IN LAST FIVE YEARS.....	
211	Now I would like to record the names of all your births in the last five years (since 2008), **whether still alive or not**, starting with the most recent one you had. RECORD NAMES OF ALL BIRTHS IN THE LAST 5 YEARS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.		

212	213	214	215	216	217 IF ALIVE:	218 IF ALIVE	219 IF ALIVE:	220
What name was given to your (most recent/ previous) birth? RECORD CHRONO-LOGICAL-LY FROM MOST RE-CENT TO OLDEST (NAME)	Were any of these births twins? SING.....1 MULT.....2	Is (NAME) a boy or a girl? BOY.....1 GIRL.....2	In what month and year was (NAME) born? PROBE: WHAT IS HIS/ HER BIRTHDAY?	Is (NAME) still alive? YES.....1 NO.....2 (NEXT BIRTH) (GO TO 220)	How old is (NAME) in complete years? AGE IN YEARS	Is (NAME) living with you? YES.....1 NO.....2	RECORD HOUSE-HOLD LISTING LINE NUMBER OF CHILD FROM HOUSEHOLD SURVEY (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD).	Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)? NOT APPLI-CABLE FOR MOST RE-CENT BIRTH YES.....1 NO.....2
01 (MOST RECENT)			MONTH YEAR				LINE NUMBER (NEXT BIRTH)	
02			MONTH YEAR				LINE NUMBER	
03			MONTH YEAR				LINE NUMBER	
04			MONTH YEAR				LINE NUMBER	
05			MONTH YEAR				LINE NUMBER	
06			MONTH YEAR				LINE NUMBER	
07			MONTH YEAR				LINE NUMBER	

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 RECONCIL CHECK: FOR EACH BIRTH: YEAR OF BIRTH IS RECORDED. FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED.		☐☐
223	CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2008 OR LATER. IF NONE, RECORD '0'.		☐
224	Are you currently expecting (pregnant)?	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 2008 OR LATER ↓ NO BIRTHS IN 2008 OR LATER →	<401

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 5 years.		
302	CHECK: 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? IF YES: Whom did you see? Anyone else? PROBE FOR THE TYPE OF PERSON AND CIRCLE ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR.....1 NURSE.....2 MIDWIFE.....3 OTHER PERSON TRADITIONAL BIRTH ATTENDANT.....4 COMMUNITY HEALTH WORKER.....5 RELATIVE/FRIEND.....6 NO ONE.....7 OTHER.....8 (SPECIFY)	
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? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, ASK IF YOU CAN SEE PACKET OF DRUGS, IF STILL AVAILABLE.	SP/FANSIDAR.....1 CHLOROQUINE.....2 DON'T KNOW.....3 OTHER_____ 4 (SPECIFY)	
306	CHECK 305: DRUGS TAKEN FOR MALARIA PREVENTION	CODE 1 CIRCLED ☐ CODE 2, 3 OR 4 CIRCLED ☐	-→310
307	How many times did you take SP/Fansidar during this pregnancy?	TIMES ☐☐	

308	CHECK 303: ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE '1', '2', OR '3' CIRCLED ☐ CODES 4, 5, 6, 7 8 CIRCLED ☐	-—<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)	
310	CHECK 215 AND 216: ONE OR MORE LIVING CHILDREN BORN IN 2008 OR LATER ☐ NO LIVING CHILDREN BORN IN 2008 OR LATER ☐		—<401

SECTION 3B.

FEVER IN CHILDREN

311	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD AGED UNDER 5 (BORN IN OCTOBER 2008 OR LATER). IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN IN OCTOBER 2008 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.)		
		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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 DON'T KNOW.....8 =——┤ IF 'NO' OR 'DON'T KNOW' GO TO Q 312 ON NEXT-TO-YOUNGEST CHILD OR, IF NO MORE CHILDREN, SKIP TO 401	YES.....1 NO.....2 DON'T KNOW.....8 =——┤ IF 'NO' OR 'DON'T KNOW', GO TO Q 312 ON NEXT CHILD (ON NEW QUESTIONNAIRE), IF NO MORE CHILDREN, SKIP TO 401
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? Anywhere else? CIRCLE ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....1 GOVT. HEALTH CENTER.....2 GOVT. HEALTH UNIT.....3 MOBILE CLINIC..... 4 COMMUNITY DRUG DISTRIBUTOR .....5 PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....6 PHARMACY.....7 PRIVATE DOCTOR.....8 MOBILE CLINIC.....9 OTHER SOURCE SHOP.....10 TRAD. PRACTITIONER.....11 OTHER _____12 (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL.....1 GOVT. HEALTH CENTER.....2 GOVT. HEALTH UNIT.....3 MOBILE CLINIC..... 4 COMMUNITY DRUG DISTRIBUTOR .....5 PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....6 PHARMACY.....7 PRIVATE DOCTOR.....8 MOBILE CLINIC.....9 OTHER SOURCE SHOP.....10 TRAD. PRACTITIONER.....11 OTHER _____12 (SPECIFY)
317	How many days after the fever began did you first seek treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS..... ☐☐	DAYS..... ☐☐
318	Is (NAME) still sick with fever?	YES.....1 NO.....2 DON'T KNOW.....8	YES.....1 NO.....2 DON'T KNOW.....8
319	At any time during the illness, did (NAME) have blood taken from his/her finger or heel for testing? (RDT OR BLOOD SLIDE DONE)	YES.....1 NO.....2 DON'T KNOW.....3	YES.....1 NO.....2 DON'T KNOW.....3

320	At any time during this illness, did (NAME) take any drugs for the fever?	YES.....1 NO..... 2 SKIP 401 =——┤ DON'T KNOW..... 8 SKIP 401 =——┤	YES.....1 NO.....2 (SKIP 401) =——┤ DON'T KNOW.....8 (SKIP 401) =——┤
321	What drugs did (NAME) take? Any other drugs? CIRCLE ALL MENTIONED. ASK TO SEE DRUG(S) OR PACKET (IF STILL AVAILABLE) IF TYPE OF DRUG IS NOT KNOWN. ***NB. ACTs (ARTEMISININ-BASED COMBINATION THERAPY):*** *ASAQ= ARTESUNATE + AMODIAQUINE* *ATM-LUM = ARTEMETHER + LUMEFRANTRINE (COARTEM)* *AS+SP = ARTESUNATE + SULPHADOXINE PYRIMETHAMINE*	<u>ACTs</u>: ASAQ……..……..1 ATM-LUM (COAR-TEM)……..2 AS+SP …….....3 <u>Non-ACTs</u>: QUININE……...4 ARTEMETHER……5 SP/FANSIDAR ..... 6 CHLOROQUINE..... 7 AMODIAQUINE..... 8 OTHER ANTIMALARIAL_____ 9 (SPECIFY) <u>OTHER DRUGS</u> ASPIRIN..... 10 ACETAMINOPHEN/ PARACETAMOL ... .11 IBUPROFEN ..... 12 OTHER 'OTHER' DRUGS _____ 13 (SPECIFY) DON'T KNOW..... 14	<u>ACTs</u>: ASAQ…….1 ATM-LUM (COARTEM)…….2 AS+SP ……...3 <u>Non-ACTs</u>: QUININE……...4 ARTEMETHER……5 SP/FANSIDAR ..... 6 CHLOROQUINE..... 7 AMODIAQUINE..... 8 OTHER ANTIMALARIAL_____ 9 (SPECIFY) <u>OTHER DRUGS</u> ASPIRIN..... 10 ACETAMINOPHEN/ PARACETAMOL.....11 IBUPROFEN ..... 12 OTHER 'OTHER' DRUGS_____ 13 (SPECIFY) DON'T KNOW..... 14
322	CHECK 321: ANY CODE 1-8 CIRCLED?	YES NO ☐ ☐ → IF NO GO TO 312 IN NEW QUESTIONNAIRE OF IF NO MORE BIRTHS, SKIP TO Q.401	
323	CHECK 321: ASAQ('1') GIVEN?	CODE '1' CIRCLED ☐ CODE '1' NOT CIRCLED ☐ (SKIP TO 327)	CODE '1' CIRCLED ☐ CODE '1' NOT CIRCLED ☐ (SKIP TO 327)
324	How long after the fever started did (NAME) first take AS+AQ?	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
325	For how many days did (NAME) take the AS+AQ? IF 7 OR MORE DAYS, RECORD '7'.	DAYS..... ☐ DON'T KNOW 8	DAYS..... ☐ DON'T KNOW 8
326	Did you have the ASAQ 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 ASAQ first?	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8

327	CHECK 321: ATM-LUM (COARTEM) (‘2’) GIVEN?	CODE ‘2’ CIRCLED ☐ ↓ CODE ‘2’ NOT CIRCLED ☐ ↓ (SKIP TO 331)	CODE ‘2’ CIRCLED ☐ ↓ CODE ‘2’ NOT CIRCLED ☐ ↓ (SKIP TO 331)
328	How long after the fever started did (NAME) first take ATM-LUM (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
329	For how many days did (NAME) take ATM-LUM (COARTEM)? IF 7 OR MORE DAYS, RECORD ‘7’.	DAYS ..... ☐ DON’T KNOW 8	DAYS ..... ☐ DON’T KNOW 8
330	Did you have the ATM-LUM (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 ATM-LUM (COARTEM) first?	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON’T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON’T KNOW.....8
331	CHECK 321: AS+SP (‘3’) GIVEN?	CODE ‘3’ CIRCLED ☐ ↓ CODE ‘3’ NOT CIRCLED ☐ ↓ (SKIP TO 335)	CODE ‘3’ CIRCLED ☐ ↓ CODE ‘3’ NOT CIRCLED ☐ ↓ (SKIP TO 335)
332	How long after the fever started did (NAME) first take AS+SP?	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
333	For how many days did (NAME) take AS+SP? IF 7 OR MORE DAYS, RECORD ‘7’.	DAYS ..... ☐ DON’T KNOW 8	DAYS ..... ☐ DON’T KNOW 8
334	Did you have the AS+SP 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 AS+SP first?	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON’T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON’T KNOW.....8
335	CHECK 321: QUININE (‘4) GIVEN?	CODE ‘4’ CIRCLED ☐ ↓ CODE ‘4’ NOT CIRCLED ☐ ↓ (SKIP TO 339)	CODE ‘4’ CIRCLED ☐ ↓ CODE ‘4’ NOT CIRCLED ☐ ↓ (SKIP TO 339)

336	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
337	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
338	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 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8
339	CHECK 321: ARTEMETHER ('5') GIVEN?	CODE '5' CIRCLED ☐ CODE '5' NOT CIRCLED ☐ (SKIP TO 343)	CODE '5' CIRCLED ☐ CODE '5' NOT CIRCLED ☐ (SKIP TO 343)
340	How long after the fever started did (NAME) first take ARTEMETHER?	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
341	For how many days did (NAME) take ARTEMETHER? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ☐ DON'T KNOW 8	DAYS ..... ☐ DON'T KNOW 8
342	Did you have the ARTEMETHER 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 ARTEMETHER first?	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8
343	CHECK 321: SP/FANDISAR ('6') given?	CODE '6' CIRCLED ☐ CODE '6' NOT CIRCLED ☐ (SKIP TO 347)	CODE '6' CIRCLED ☐ CODE '6' NOT CIRCLED ☐ (SKIP TO 347)
344	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
345	For how many days did (NAME) take SP/FANSIDAR? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ☐ DON'T KNOW 8	DAYS ..... ☐ DON'T KNOW 8

346	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 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8
347	CHECK 321: CHLOROQUINE ('7') GIVEN?	CODE '7' CIRCLED ☐ CODE '7' NOT CIRCLED ☐ ↓ (SKIP TO 351)	CODE '7' CIRCLED ☐ CODE '7' NOT CIRCLED ☐ ↓ (SKIP TO 351)
348	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
349	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
350	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 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8
351	CHECK 321: AMODIQUINE ('8') GIVEN?	CODE '8' CIRCLED ☐ CODE '8' NOT CIRCLED ☐ ↓ (SKIP TO 355)	CODE '8' CIRCLED ☐ CODE '8' NOT CIRCLED ☐ ↓ (SKIP TO 355)
352	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
353	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
354	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 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8	AT HOME.....1 GOVERNMENT HEALTH FACILITY/WORKER.....2 PRIVATE HEALTH FACILITY/WORKER.....3 SHOP.....4 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8

355		GO BACK TO 312 IN NEXT COLUMN, OR, IF NO MORE CHILDREN, GO TO 401.	GO BACK TO 312 IN FIRST COLUMN OF NEW QUESTIONNAIRE, OR, IF NO MORE CHILDREN UNDER 5, GO TO 401.

☐ TICK HERE IF CONTINUATION SHEET USED. IE. IF MORE THAN 2 CHILDREN UNDER 5

SECTION 4:

KNOWLEDGE AND ATTITUDE OF MALARIA

401	Can you tell me how one can get (or catch) malaria? (MULTIPLE RESPONSES ALLOWED. PROBE IF THERE ARE OTHER WAYS)	BY WORKING IN THE SUN ..... 1 BY BEING BITTEN BY MOSQUITOES ..... 2 BY DRINKING DIRTY WATER ..... 3 BY EATING SOME FOODS ..... .4 BY STAYING OUT IN THE RAIN ..... 5 FROM ANOTHER PERSON WITH MALARIA ..... 6 BY PLAYING OR BATHING IN RIVERS OR PONDS WHERE SNAILS ARE PRESENT ..... 7 DON'T KNOW ..... 8 OTHERS ..... 9 (SPECIFY)
402	Can you tell me how you can protect yourself (or your family) against Malaria? (MULTIPLE RESONSES ALLOWED. PROBE IF THERE ARE OTHER WAYS)	BY AVOIDING CONTACT WITH PEOPLE WITH MALARIA.....1 BY SLEEPING UNDER A BED NET .....2 BY SLEEPING UNDER AN INSECTICIDE TREATED MOSQUITO BED NET.....3 BY TAKING PREVENTIVE MEDICATION.....4 BY TAKING PREVENTIVE HERBS.....5 BY USING AMULETS .....6 BY SPRAYING THE WALLS OF THE HOUSE WITH INSECTICIDE.....7 BY AVOIDING STAYING TOO LONG IN THE SUN.....8 BY KEEPING THE HOUSE CLEAN.....9 BY KEEPING THE WINDOWS CLOSED .....10 BY DRINKING CLEAN WATER.....11 BY DRAINING/ TREATING STAGNANT WATER .....12 DON'T KNOW.....13 OTHER _____ 14 (SPECIFY)
403	What is the right medicine to take when you (or a member of your family) get malaria? (ASK RESPONDENT TO DESCRIBE THE MEDICINE IF HE/ SHE DOESN'T KNOW THE NAME. MULTIPLE RESPONSES ALLOWED).	ARTESUNATE + AMODIAQUINE (AS+AQ) .....1 ARTEMETHER/ LUMEFANTRINE (COARTEM).....2 ARTESUNATE + SP (FANDISAR).....3 QUININE.....4 ARTEMETHER.....5 ARTESUNATE.....6 CHLOROQUINE.....7 SP/FANSIDAR .....8 AMODIAQUINE.....9 PANADOL.....10 ASPIRIN.....11 IBUPROFEN .....12 DON'T KNOW.....13 OTHER .....14 (SPECIFY)

A:

B:

SECTION5: BLOOD TESTS (PREGNANT WOMEN ONLY)

501	CHECK 224 IS WOMAN CURRENTLY PREGNANT? PREGNANT ☐ → REQUEST TO TAKE BLOOD SAMPLE FROM WOMAN NOT PREGNANT ☐ →	END QUESTIONNAIRE

READ CONSENT STATEMENT BELOW TO WOMAN CIRCLE CODE AND SIGN GRANTED = 1 REFUSED = 2	RESULT OF BLOOD TEST 1 MEASURED 2 NOT PRESENT 3 REFUSED 4 OTHER	HAEMOGLOBIN LEVEL (ANAEMIA RESULT) (G/DL)	RDT RESULT (MALARIA RESULT) POSITIVE=1 NEGATIVE=2 INVALID=3	TREATMENT (ANEMIA/MALARIA) **(NOTE: CIRCLE ALL THAT APPLIES)**	BLOODSLIDE: DONE .....1 NOT PRESENT .....2 REFUSED.....3 OTHERS 4	BLOODSLIDE NUMBER: A=THICK SLIDE B=THIN SLIDE COPY NUMBER ON BLOOD SLIDE
(502)	(503)	(504)	(505)	(506)	(507)	(508)
1 SIGN/PRINT _____ 2	☐ OTHER (SPECIFY)	☐☐.☐	☐	AS+AQ ..... 1 QUININE..... 2 IRON..... 3 ALBENDAZOLE ..... 4 PARACETAMOL ..... 5 SP/FANDISAR ..... 6 REFERRED ..... 7 REFUSED..... 8	☐	☐☐☐☐☐☐☐☐ A ☐☐☐☐☐☐☐☐ B

CONSENT STATEMENT: As part of this survey, we are studying anaemia and blood parasite levels among children under five and pregnant women. Anaemia is a serious health problem that results from poor nutrition or diseases such as malaria. Both anaemia and malaria are common conditions in pregnant women. This survey will assist the government to develop programs to prevent and treat these important health problems.

We request that all pregnant women participate in the anaemia and parasitaemia testing part of this survey and give a few drops of blood from a finger. The test uses disposable sterile instruments that are clean and completely safe. The blood will be analysed with new equipment and tested for malaria and anaemia. The results of the test will be given to you right after the blood is taken and treatment provided if necessary. The results will be kept confidential.

May I now ask that you participate in the blood tests. However, if you decide not to be tested, it is your right and we will respect your decision. Now please tell me if you agree to have the test(s) done.

INTERVIEWER'S OBSERVATIONS

(TO BE FILLED IN AFTER COMPLETING INTERVIEW)

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SIGNATURE OF INTERVIEWER.....

PHONE..... DATE.....

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR: .....

SIGNATURE.....

PHONE..... DATE: .....

MINISTRY OF HEALTH

National Malaria Control Programme
Directorate of Preventive Health Services

REPUBLIC OF SOUTH SUDAN