GOVERNMENT OF SOUTHERN SUDAN
MALARIA INDICATOR SURVEY
REPORT 2009

Table of Contents

List of Tables and Figures

LIST OF ACRYONMS

ACC/SCN	Administrative Committee on Coordination/Sub Committee on Nutrition
ACT	Artemesinin-combination therapy
ANC	Antenatal Care
AS+AQ	Artesunate plus Amodiaquine
CQ	Chloroquine
DG	Director General
DHS	Demographic and Health Survey
EA	Enumeration Area
GoSS	Government of Southern Sudan
IPT	Intermittent Preventive Treatment
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Mosquito Nets
LLIN	Long Lasting Insecticide Treated Mosquito Nets
MC	Malaria Consortium
M & E	Monitoring and Evaluation
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MSH, SPS	Management Sciences for Health, Strengthening Pharmaceuticals Systems
NGO	Non Governmental Organization
NMCP	National Malaria Control Program
PSI	Population Services International
RDT	Rapid Diagnostic Test
SHHS	Sudan Household and Health Survey
SP	Sulphadoxine-pyrimethamine
SSCCSE	Southern Sudan Centre for Census Statistics and Evaluation
SSMIS	Southern Sudan Malaria Indicator Survey
TOT	Training of Trainers
UNDP	United Nations Development Program
UNICEF	United Nations Children's Education Fund
WHO	World Health Organization

FOREWORD

Malaria is a leading cause of morbidity and mortality in Southern Sudan: it accounts for 20% – 40% of the morbidity and over 20% of the deaths in all age groups seen at health facilities. Children and pregnant women are the most vulnerable. While the socioeconomic burden of the disease has not yet been documented, it is expected to be quite high.

The climatic conditions in Southern Sudan allow for malaria transmission to occur throughout the year. In addition, Southern Sudan has virulent malaria vectors and *Plasmodium falciparum,* the parasite species that causes severe forms of malaria is responsible for over 90% of the clinical episodes. The disruption of malaria control and prevention services following several years of civil has also allowed for unchecked malaria transmission.

The Ministry of Health, Government of Southern Sudan, has put in place sound malaria control policies and strategies and established a platform for coordinated scale up of cost effective malaria interventions. The overall target of the Malaria Control Program is to ensure that at least 60% of those at risk of, or suffering from malaria, benefit from major preventive and curative interventions in accordance with WHO technical recommendations.

Over the last 3 years, significant progress has been made in the control of malaria in Southern Sudan; the new malaria treatment protocol based on the use of Artemisinin-based Combination Therapies (ACTs) has been rolled out in all 10 states and over 5 million ACT treatments provided; more than 4 million Long Lasting Insecticidal Nets (LLINs) have been distributed; considerable funding for malaria control and prevention has been mobilized; and, an active in-country malaria partnership has been set up to ensure coordinated implementation.

The Ministry of Health with support of its partners conducted the 2009 Malaria Indicator Survey (MIS) in order to determine the coverage of malaria interventions and evaluate the impact of scaled-up implementation. The comprehensive, nationally-representative household survey was designed in accordance with the Roll Back Malaria Monitoring and Evaluation Reference Group (MERG) guidelines. The MIS is part of the ongoing efforts to strengthen MoH capacity to effectively monitor and evaluate health programs.

The 2009 MIS has provided up-to-date information on key malaria indicators for policy makers, planners, and program managers, to use in the planning, implementation, monitoring and evaluation of malaria programs in Southern Sudan. To ensure better understanding and use of these data, the results of this survey need to be widely disseminated at all planning levels.

More importantly, together with our partners, we need to ensure that the appropriate interventions are provided to the people who need them most.

11 FEB 2011

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ACKNOWLEDGEMENT

The successful execution of the 2009 Malaria Indicator Survey (MIS) required the input of various individuals and organizations. The survey was a joint venture of the Ministry of Health, Government of Southern Sudan and its malaria support partners.

I take this opportunity to extend my heartfelt thanks to the Undersecretary Ministry of Health GoSS, Dr Olivia Lomoro and the Director General for External Relations and Coordination, Dr Samson Baba, for providing overall strategic guidance to the MIS coordination committee. More importantly, I acknowledge and sincerely thank the Survey Director Dr Margaret Betty Eyobo Lejukole, Deputy Survey Director – Laboratory Mr. Gregory Wani, and Deputy Survey Director -Statistics Mr. Adwok Chol Awur, for their untiring effort in planning and executing the survey.

I also acknowledge the critical contribution of the Malaria Technical Working Group (TWG) members in the planning, design and actual implementation of the 2009 Malaria indicator Survey. Significant technical assistance was provided by Management Sciences for Health, Malaria Consortium, Population Services International (PSI), WHO and UNICEF. The SSCCSE assisted the malaria TWG in the aspects of survey methodology and design, development of study tools and preparation of enumeration area (EA) maps. Additional technical support was received from the Malaria Consortium regional office, EARN and MACEPA.

Funding for the survey was provided by the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria through Population Services International (PSI) and United Nations Development Program (UNDP); Department for International Development (DFID) through Malaria Consortium; United States Agency for International Development (USAID) through Management Sciences for Health – SPS; World Bank, UNICEF and WHO. The Ministry of Health would like to thank all the above organizations for the financial support.

I would like to thank the National Malaria Control Program which served as the secretariat and coordinated all survey activities. In this function, the Malaria Control Program was supported by staff of Management Sciences for Health-SPS and Malaria Consortium.

I am grateful for the efforts of all officials at national, state, county and lower levels who supported the survey. Finally, we highly appreciate all the field workers and, more importantly, the survey respondents especially the women, whose participation was critical to the successful completion of this survey.

I also thank Mr. Daniel Mwero and Mr. Stephen Baryahirwa who coordinated the data analysis and report writing aspects of the 2009 Malaria Indicator Survey, and all those who whose names are not mentioned but contributed to the success of the survey.

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SUMMARY OF FINDINGS

The 2009 Southern Sudan Malaria Indicator Survey (SSMIS) was carried out in November/December 2009 using a nationally representative sample of 3,000 households. A total of 2,797 households were successfully interviewed. All household heads were interviewed. In each household, all eligible women (i.e. women age 15-49 years) were interviewed and were asked questions about malaria prevention during pregnancy and treatment of childhood fevers. They were also asked questions regarding their knowledge about the cause, prevention and treatment for malaria. In addition, the survey included testing for anemia and malaria among children age 0-59 months and women who were pregnant at the time of the survey. Using a finger (or heel) prick blood sample, results from anemia and malaria testing were available immediately and for those found to be anemic or Rapid Diagnostic Test (RDT) positive, treatment was provided. Thick and thin blood smears were also prepared in the field and taken to a reference laboratory in Juba for microscopic examination. All positive slides plus 10% of the negative slides were later taken to a WHO prequalified laboratory in the Republic of Oman for quality control.

The 2009 SSMIS was designed to provide data to monitor all the key malaria outcome indicators in the Southern Sudan Malaria Strategic Plan. Specifically, the SSMIS collected information on ownership and use of mosquito nets, intermittent preventive treatment for pregnant women, timing and type of treatment of childhood fever, and prevalence of malaria parasites and anemia among young children and pregnant women.

MOSQUITO NET OWNERSHIP AND USE

Overall, 59 percent of households in Southern Sudan have at least one mosquito net, 53 percent have at least one insecticide treated mosquito net and 51 percent have at least one Long Lasting Insecticide Treated Net (LLIN). On average, 25 percent of households have at least one mosquito net for every two people. Considering all households, only 25 percent of children slept under an ITN while 36 percent of pregnant women slept under an Insecticide Treated Mosquito Net (ITN) the night preceding the survey. The results further show that nearly all ITNs are LLIN.

INTERMITTENT PREVENTIVE TREATMENT FOR PREGNANT WOMEN

Women who had a live birth in the last two years preceding the survey were asked if they had taken any drugs to prevent getting malaria during that pregnancy and, if yes, which drug. Only 13 percent of women reported that they took SP/Fansidar two or more times during the pregnancy, at least one of which was during Antenatal Care (ANC) visit.

FEVER AND TREATMENT OF CHILDREN

Survey results show that 35 percent of children under five years had a fever in the two weeks preceding the survey. The prevalence of fever is lowest in Bahr el Ghazal region with 19 percent of the children having suffered from fever and highest in Equatoria region with 52 percent. Advice and/or treatment from a health facility or health care provider was sought for 52 percent of the children. Thirty-six percent took an anti-malaria drug, with 25 percent using anti-malaria drugs recommended under the national malaria treatment protocol. However, only 11 percent took anti-malaria drugs on the same or next day after falling sick.

ANEMIA IN CHILDREN AND PREGNANT WOMEN

Survey data shows that anemia is a public health problem in Southern Sudan. Almost two thirds (64 percent) of children 0-59 months old are anemic. Twenty-three percent of children are mildly anemic, while another 30 percent are moderately anemic, and 11 percent are severely anemic. The data shows that anemia is highest among children 12-23 months old and from 24 months and older, the proportion of children with anemia decreases with age.

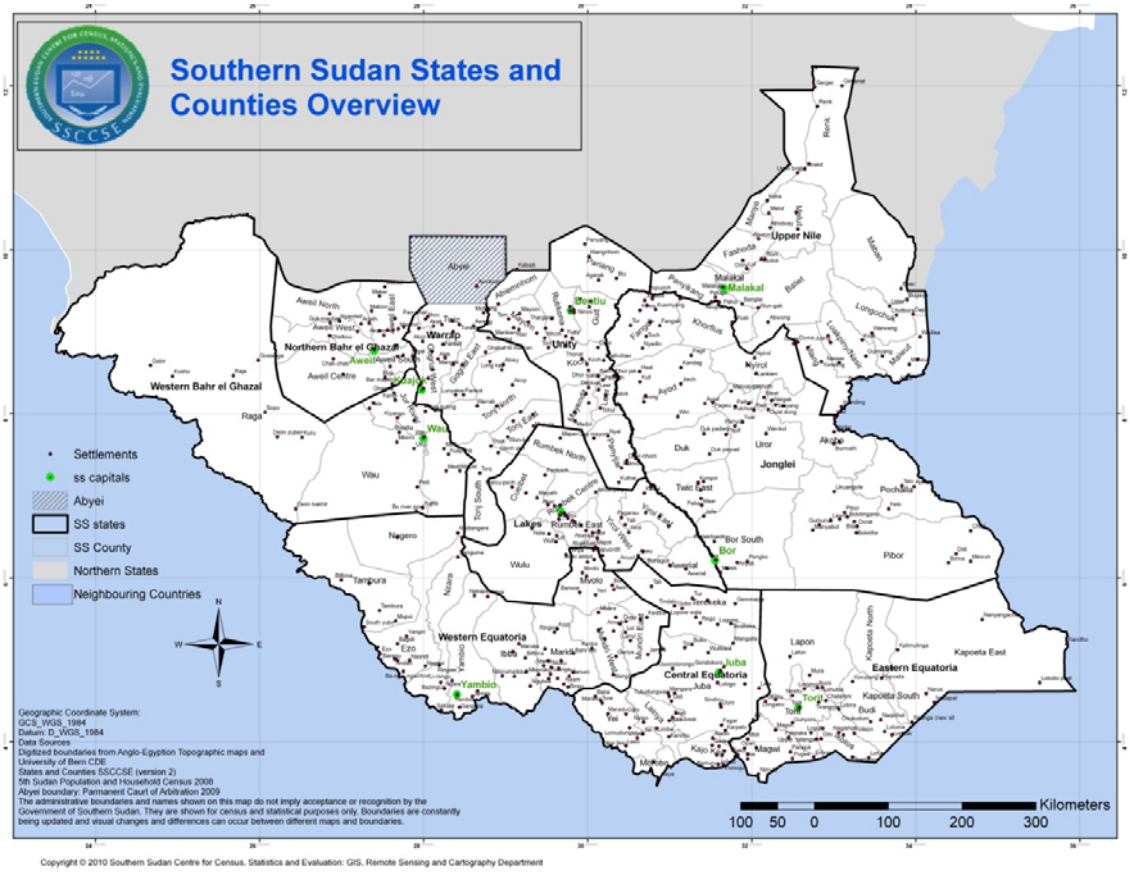
Considering pregnant women, the results of the 2009 SSMIS show that 46 percent of pregnant women at the time of the survey are anemic; twenty-three percent are mildly anemic 19 percent are moderately anemic and only four percent are severely anemic.

MALARIA PREVALENCE

Prevalence of malaria among children aged 0-59 months and pregnant women was measured in the 2009 SSMIS in two ways. In the field, health technicians used RDT to determine whether children had malaria using finger or heel prick blood samples. In addition, thin and thick smears from each child's/pregnant woman's blood were made in the field, dried in dust-free environment, stored in slide boxes and transported to Juba for microscopy.
Using RDT, 25 percent of children 0-59 months tested positive for malaria while 10 percent of pregnant women tested positive. Malaria prevalence was higher in rural areas than in urban areas. The results further show that in both children under five years and pregnant women, malaria prevalence was highest in Equatoria region (48 percent for children and 15 percent for pregnant women). Lower malaria parasite prevalence rates were found through microscopy.

1 INTRODUCTION

1.1 COUNTRY PROFILE



Southern Sudan is dominated by savannah with only minor mountains. The climate is tropical with temperatures ranging from an average minimum of 20°C and maximum of 37°C and relative humidity between 26% and 88%. Annual rainfall ranges from 1,000 mm in the south and 400 mm in the northern parts. The duration of the rainfall is longest in the south (7-8 months) and reduces towards the northern part (5-6 months). During the rainy season, flooding is common in most parts.

Southern Sudan covers an area of about 650,000 square kilometres and is divided into 10 states; namely Upper Nile, Unity, Jonglei, Eastern Equatoria, Central Equatoria, Western Equatoria, Lakes, Western Bahr el Ghazal, Northern Bahr el Ghazal and Warrap. There is a decentralisation of power at state level; nevertheless, the central government still maintains the

role of policy setting and supervision of standards. About 71% of the territory is suitable for agriculture, 24% is a forest while 5 percent is arid/semi arid. Agriculture is the main source of income for more than 85% of the population.

The formal health system comprises public, private not-for-profit (PNFP) and private for-profit sectors, but there is a fairly large informal sector including traditional medicine providers, medicine vendors and shops, and complementary and alternative practitioners.

1.2 BACKGROUND ON MALARIA IN SOUTHERN SUDAN

Southern Sudan is emerging from two decades of civil war which has devastated the regions' structures for social services. Most of the population lacks access to health care, education, clean water and sanitation. The region's lack of services coupled with chronic insecurity and debilitating poverty has had profound implication on health conditions of the communities.

It is estimated that over 70% of the Sudanese population living in endemic areas are at risk of malaria. In Southern Sudan, malaria endemicity varies between mesoendemic, hyper-endemic and holoendemic. It accounts for 20% – 40% of the morbidity and over 20% of the deaths in all age groups seen at health facilities. While the socioeconomic burden of malaria in Southern Sudan has not been documented, it is expected to be quite high. Local capacity for response to malaria is inadequate due to poverty and extreme climatic factors leading to proliferation of mosquito breeding sites and high transmission rates.

Malaria epidemics and more localized outbreaks do occur and are caused by environmental and climatic factors (*e.g.* massive flooding) but also by movement of populations with little immunity into areas of high transmission, as well as lack of access to effective anti-malaria treatment in some areas. The major difficulty at the moment is, however, that no exact data are available to assess whether reported cases are within or above expected seasonal variation and therefore represent an epidemic or not.

The Government of Southern Sudan (GOSS) through the Ministry of Health (MOH), Malaria Control Program (MCP), developed a Southern Sudan Malaria Control Strategic Plan (MCSP) 2007-2011 which is currently being implemented. This plan details national prevention and control strategies with the following objectives:

i) Increase the population coverage with effective malaria prevention as part of an integrated vector control strategy that utilizes all approaches including long-lasting insecticidal nets, indoor residual spraying and environmental management when and where most suitable and sustainable.
ii) Provide wide access to appropriate diagnosis and highly efficacious artemisinin-based combination therapy to all affected by malaria using a mix of approaches that include public and private health care providers, a trained and supervised commercial sector and community distribution.
iii) Deliver a package consisting of ITN, IPT and effective treatment to pregnant women through comprehensive and focused ante-natal care services involving all levels of health care including the communities.
iv) Mobilize all sectors of society to promote malaria control and increase adoption of positive behaviour, based on a comprehensive malaria communication strategy that includes all available media and communication channels

v) Detect early and respond rapidly to malaria outbreaks and epidemics as part of an effective disease surveillance Program.
vi) Strengthen the Malaria Control Program within the Ministry of Health of the Government of Southern Sudan to be able to take the lead in integrated efforts aimed at the control of malaria involving all sections of society.
vii) Support the strengthening and expanding of the health system through staff training, supervision, effective management, efficient planning and coordination at all levels.
viii) Establish a sound and continuously updated database that monitors progress towards agreed targets and is used to effectively manage and adjust interventions based on evidence.

Major national prevention activities include distribution of Long Lasting Insecticide treated mosquito Nets (LLINs). More than 4 million LLINs had been distributed by December 2009. In 2006, the Southern Sudan government rolled out a new case management policy in which the recommended first-line treatment for uncomplicated malaria was changed from Chloroquine or Fansidar (SP) to artemisinin-based combination therapy (ACT), which was deemed more efficacious and cost-effective. Artesunate+Amodiaquine is the recommended first line while Artemether/Lumefantrine is the second line for treatment. To ensure prompt and effective treatment of malaria for children under 5 years, Southern Sudan is rolling out the Home Management of Malaria (HMM) strategy. Trained Community based Drug Distributors (CBDs) provide first line treatment for uncomplicated malaria to febrile children at the community level.

1.3 OBJECTIVES OF THE SOUTHERN SUDAN MALARIA INDICATOR SURVEY

Since 2007, the NMCP and her partners have been aiming at scaling-up malaria interventions in all parts of the territory. In order to determine the progress made in malaria control and prevention in Southern Sudan, the 2009 Southern Sudan Malaria Indicator Survey (SSMIS) was designed to provide data on key malaria indicators including mosquito net ownership and use, as well as prompt and effective treatment with ACT.

The key objectives of the 2009 MIS were to:

- Measure the coverage of core malaria interventions: ownership and use of insecticide treated mosquito nets; effective treatment within 24 hours of fever on-set; use of intermittent preventive treatment during pregnancy;
- Assess the prevalence (occurrence) of malaria parasites among children aged under 5 years and pregnant women
- Assess the level of anemia among children aged under 5 years and pregnant women

In addition, knowledge and attitudes of care givers towards malaria was assessed.

1.4 METHODOLOGY OF THE SOUTHERN SUDAN MALARIA INDICATOR SURVEY

The 2009 SSMIS was carried out between November and December 2009, using a nationally representative sample of 3000 households in 150 census enumeration areas. All women

aged 15-49 years in these households were eligible to be individually interviewed and were asked questions about malaria prevention during pregnancy and treatment of childhood fevers. Also their knowledge and attitude towards malaria was assessed. There was also a questionnaire administered to the household head which asked questions on background characteristics such as household composition, bed net ownership, whether any IRS had been done or conducted in the household, etc. In addition, the survey included testing for anemia and malaria among children age 0-59 months and pregnant women using finger (or heel) prick blood samples. Test results for anemia (using the HemoCue portable machine) and malaria (using malaria RDT) were available immediately and were provided to the children's parents or guardians. Thick and thin blood smears were also made in the field and transported to Juba Teaching Hospital reference laboratory for microscopy to determine the presence and species of malaria parasites.

1.4.1 Survey Organization

The 2009 MIS was implemented by the **Ministry of Health** in collaboration with other stakeholders. These included **Southern Sudan Centre for Census Statistics and Evaluation, Malaria Consortium**, **Population Services International (PSI), Management Sciences for Health** SPS program, **WHO**, **UNICEF** and **UNDP.** The MOH was responsible for general administrative management of the survey, including overseeing of day-to-day operations, designing the survey, and the processing of data. The Ministry took primary responsibility for organizing the Technical Working Group and developing the survey protocol, participating along with SSCCSE in recruiting, training, and monitoring field staff.

The Southern Sudan Centre for Census Statistics and Evaluation (SSCCSE) 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 data collection, survey methodology and design, sample size, questionnaire development, development of supervisors' and interviewers' manuals, and training of interviewers. The SSCCS also led the preparation of adequate enumeration area (EA) maps that were used during the field work.

Technical assistance was provided by Management Sciences for Health SPS program, Malaria Consortium, Population Services International, and WHO**.** Staff from these organizations assisted with overall survey design, sample design, questionnaire design, field staff training, survey logistics, field work monitoring, data processing, data analysis and report preparation.

Financial support for the survey was provided by GFATM through Population Services International (PSI), DFID through Malaria Consortium, USAID through Management Sciences for Health - SPS, UNDP, UNICEF and WHO.

1.4.2 Sample Design

The survey was designed to provide national and regional estimates of key malaria indicators. The sample was stratified into 3 survey regions of the territory. Each of the three regions comprised of 3-4 states of Southern Sudan

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

ii. **Greater Bahr el Ghazal**: Western Bahr el Ghazal, Northern Bahr el Ghazal, Warrap and Lakes
iii. **Greater Upper Nile**: Unity, Upper Nile and Jonglei

Thus the sample was not spread geographically in proportion to the population, but rather equally across three regions, with 50 enumeration areas or clusters per region. Although weights were to be computed for the sample, this could not happen as almost 25 percent of the household listing forms could not be traced to compute the probabilities. However, it is important to note that the populations in the three strata were almost the same and as such failure to compute the weights has little or no effect on the results.

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

Region	Number of Households	Population
Upper Nile	405,929	2,908,765
Bahr el Ghazal	454,082	2,722,987
Equatoria	449,258	2,628,747
Total	**1,309,269**	**8,260,499**

The survey utilized a two-stage sample design. The first stage involved selecting sample points or clusters from a list of enumeration areas (EAs) covered in the 2008 Population Census. A total of 150 enumeration areas with probability proportional to size were selected. 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. 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 MIS: a Household Questionnaire and a Woman's Questionnaire for 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 Demographic and Health Surveys (DHS) programs. In consultation with the Technical Committee the model questionnaires were modified to reflect relevant issues of malaria in Southern Sudan.

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 are eligible for the individual interview and children aged 0-59 months for anemia 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, ownership of various durable goods, and ownership and use of mosquito nets. In addition, this questionnaire was used to record consent and results with regard to the anemia and malaria testing of young children (under 5 years) and pregnant women.

The **Woman's Questionnaire** was used to collect information from all women aged 15-49 years and covered the following topics:

- Background characteristics (age, residential history, education, literacy, religion, dialect)
- Full reproductive history
- Prenatal care and preventive malaria treatment for most recent birth
- Prevalence and treatment of fever among children under five years
- Knowledge about malaria (causes, ways to prevent and recommended treatment)

1.4.4 Anemia and Malaria testing

The 2009 MIS incorporated three "biomarkers," which were collected through finger (or heel) prick blood samples from children age 0-59 months and pregnant women 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 three 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 women. After obtaining informed consent from the child's parent or guardian and the pregnant women, 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 201+ analyzer which produces a result in less than one minute. Results were given to 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 were recorded on the household 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 anemia testing, a drop of blood was tested immediately using the Paracheck Pf™ rapid diagnostic test (RDT), 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 (such as Paracheck Pf™) 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 the standard protocol for treating malaria in Southern 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 reference laboratory for microscopy testing.

1.4.5 Fieldwork

A total of 208 field staff were recruited for the MIS. The breakdown was as follows: 156 enumerators (78 interviewers and 78 laboratory technicians), 16 reserves (consisting of interviewers, laboratory technicians and supervisors), 26 supervisors (1/team) and 10 field operations managers (1/state). These were mobilized from the states through the state census Directors and DGs at the state Ministry of Health. An orientation package was sent to each of the 10 states, with a copy to the state governors, ministers of health, and county commissioners. Each field team was made up of 3 interviewers, 3 laboratory technicians and a supervisor. As such a team consisted of 3 sub-teams. All teams in a single state were coordinated through their supervisors with the state field operations manager, who coordinated with the central team in Juba through the communications person located at the National Malaria Control Program Office. The communications person briefed the core technical team on a daily basis.

Prior to the training in the states, a Training of Trainers (TOT) for the principal trainers was conducted. Participants comprised of people selected from renown institutions like the M&E Department at the Ministry of Health/GOSS, the Nursing Training Institute at Juba Teaching Hospital, the Clinical Officers' Training Institute, Juba, Juba Teaching Hospital-Laboratory Unit, the SSCCSE and the National Malaria Control Program. This training lasted 5 days and was conducted by the MIS central core team.

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 decentralized trainings took about two weeks. Immediately after the two weeks 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 6 highly qualified senior laboratory technicians at Juba Teaching Hospital. Based on standard laboratory malaria microscopy procedures, the 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 blood film was not read.

For external quality control, all positive blood slides plus 10% of the negative slides were sent for cross-checking at a WHO pre-qualified laboratory in the Republic of Oman.

1.4.7 Data Processing

The processing of the MIS questionnaire data began six months after the fieldwork. This was because of logistical problems. A data processing consultant was hired to undertake the preparation of the data processing. Data processing staff were recruited and trained, these consisted of a supervisor from SSCCSE and data entry operators. 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.

1.5 RESPONSE RATES

Table 1.2 shows response rates for the 2009 MIS. Of the 3,000 households expected to be interviewed from the selected sample, 2,869 were found at the time of the fieldwork. The shortfall is due to some enumeration areas which could not be done due to insecurity in a few areas of the Upper Nile region and a few households found to be vacant or destroyed. Of the existing households, 2,797 were successfully interviewed, yielding a household response rate of 97.5 percent.

In the households interviewed in the survey, a total of 3,945 eligible women were identified, of whom 3,040 were successfully interviewed yielding a response rate of 77.2 percent. The household and women's response rates are slightly lower in the rural than in urban sample.

Table 1.2: Results of Household and individual interviews
Number of households, number of interviews, and response rates, according to residence, Southern Sudan MIS 2009

Result	Rural	Urban	Total
Household Interviews			
Household occupied	2,381	488	2,869
Household interviewed	2,316	481	2,797
Household response rate[1]	97.2	98.6	97.5
Interviews with Women – 15-49 yrs			
Number of eligible women in households	3,137	808	3,945
Number of eligible women interviewed	2,400	642	2975
Eligible women response rate[2]	76.5	79.5	77.1

[1] **Household interviewed/Household occupied**

[2] **Women interviewed/Eligible Women**

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN RESPONDENTS 2

This chapter gives summary information on some socioeconomic characteristics of the households and eligible women interviewed in the 2009 SSMIS. All the usual residents of each household selected and visitors present in the household on the night before the survey were listed in the Household Questionnaire. For the purpose of this survey, a household was defined as a person or group of persons, related or not, living together in the same dwelling unit, under one household head, sharing a common source of food. Baseline information such as age and sex were collected for each person. This method of data collection allows the analysis of the results for either the de jure (usual residents) or de facto (those who are there at the time of the survey) populations. The household questionnaire also obtained information on housing facilities, (e.g., source of water supply, and sanitation facilities) and household possessions. These latter items are used to create an index of relative wealth which is described in this chapter. The criteria used to form the wealth index are based on work done previously by the ORC Macro as used in DHS.

The woman questionnaire collected some background information about women. This chapter also provides a profile of the women who were interviewed in the SSMIS. Information is presented on basic characteristics including age at the time of the survey, religion, residence, education, and wealth quintile.

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.

2.1 POPULATION BY AGE AND SEX

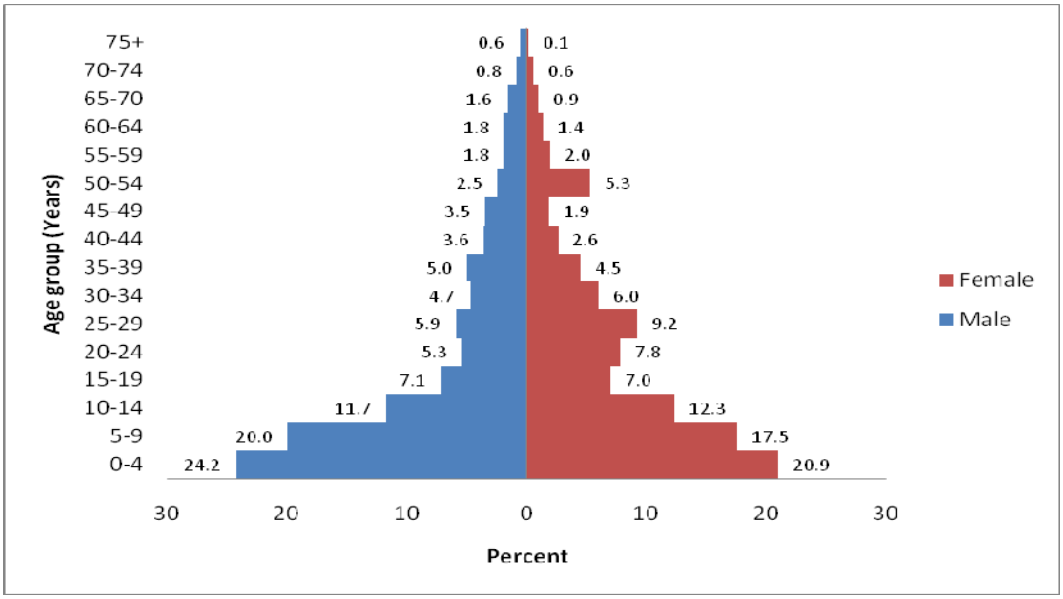
Age and sex are important demographic variables and are the primary basis of demographic classification. Table 2.1 shows the reported distribution of the de facto household population in the 2009 SSMIS by five-year age groups, residence and sex.

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, Southern Sudan MIS 2009

Age	Urban			Rural			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	21.0	20.9	21.0	25.0	20.9	22.8	24.2	20.9	22.5
5-9	16.3	15.0	15.6	20.9	18.1	19.4	20.0	17.5	18.7
10-14	13.3	14.2	13.8	11.2	11.9	11.6	11.7	12.3	12.0
15-19	10.5	10.7	10.6	6.3	6.1	6.2	7.1	7.0	7.1
20-24	6.8	9.1	8.0	5.0	7.5	6.3	5.3	7.8	6.7
25-29	8.4	8.4	8.4	5.3	9.4	7.5	5.9	9.2	7.7
30-34	4.4	4.6	4.5	4.8	6.3	5.6	4.7	6.0	5.4
35-39	5.7	2.5	5.1	4.8	4.5	4.6	5.0	4.5	4.7
40-44	3.4	4.6	2.9	3.6	2.7	3.1	3,6	2.6	3.1
45-49	4.0	1.6	2.8	3.3	1.9	2.6	3.5	1.9	2.6
50-54	2.0	4.0	3.0	2.6	5.6	4.2	2.5	5.3	4.0
55-59	1.4	1.7	1.6	1.9	2.1	2.0	1.8	2.0	1.9
60-64	1.4	1.4	1.4	1.9	1.4	1.6	1.8	1.4	1.6
65-69	0.8	0.8	0.8	1.8	1.0	1.3	1.6	0.9	1.2
70-74	0.4	0.4	0.4	1.0	0.6	0.8	0.8	0.6	0.7
75+	0.4	0.2	0.3	0.7	0.1	0.4	0.6	0.1	0.4
Total	**1,637**	**1,743**	**3,380**	**6,329**	**7,292**	**13,621**	**7,966**	**9,035**	**17,001**
Number	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The data show that about 17,000 people were enumerated in the survey with women constituting 52 percent of the population and men constituting 48 percent. The sex composition of the population shows some variation by residence. (Urban 51 Vs 49 percent while Rural 53 Vs 47 percent). Like most of Sub Saharan Africa, the data further depicts the population of Southern Sudan as young, with a large proportion of the population being in the younger age groups. The population under age 15 years constitutes 53 percent of the total population and only 2.3 percent are 65 or older.

Figure 2.1: Population Pyramid



2.2 HOUSEHOLD COMPOSITION

Information on key aspects of the composition of households including the sex of the head of the household and the size of the household is presented in Table 2.2. These characteristics are important because they are associated with the welfare of a household. Female-headed households are, for example, typically poorer than male-headed households. Economic resources are often more limited in larger households. Moreover, where the size of the household is large, crowding also can lead to health problems.

Survey results show that households in the Southern Sudan are predominantly male-headed (68 percent), a common feature in African countries. Nevertheless, slightly over three in ten households are headed by women with the proportion of female–headed households just slightly higher in the rural setting than in the urban.

The mean household size is 6.4 persons and is higher in urban areas (7.2 persons) than in rural areas (6.2 persons). One-person, two-person and three-person households are almost evenly distributed in both urban and rural areas, however, four person, five person and six person households are more common in rural areas than in the urban setting. The data finally shows that there is a sizeable proportion of the households (7 percent) with more than 12 persons and most of these are in urban 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, Southern Sudan MIS, 2009

	Residence		
Characteristic	Urban	Rural	Total
Household headship			
Male	68.8	67.2	67.5
Female	31.2	32.8	32.5
Total	100.0	100.0	100.0
Number of usual members			
1	2.3	2.3	2.3
2	4.8	5.0	5.0
3	8.7	9.2	9.1
4	9.6	13.9	13.2
5	11.0	15.7	14.9
6	10.6	15.4	14.6
7	10.8	12.9	12.6
8	10.6	7.7	8.2
9	8.1	5.1	5.7
10	7.1	4.5	5.0
11	4.4	2.2	2.6
12+	12.1	6.0	7.0
Total	100.0	100.0	100.0
Mean size of households	**7.2**	**6.2**	**6.4**
Number of households	**481**	**2,316**	**2,797**

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

2.3 HOUSEHOLD SETTING

The physical characteristics of the structure in which a household lives are important determinants of the health status of household members, especially children. They can also be used as indicators of the socioeconomic status of households. Household respondents were asked a number of questions about their household environment, including questions on the source of drinking water, type of toilet facility, cooking fuel, and the type of floor of the dwellings that they occupy. The results are presented both in terms of households and of the de jure population.

2.3.1 Source of Drinking Water

Table 2.3 shows the percent distribution of households and of population by the source of the household's drinking water. Sources which are likely to provide water suitable for drinking are identified as 'improved sources'. They include a piped source within the dwelling or plot, public tap or standpipe, tube well or borehole, protected well or spring, rainwater, and bottled water.[1] It should be noted however that, even if water is obtained from an improved source, it may be contaminated during transport or storage.

Sixty five percent of the households in the Southern Sudan have an improved source of drinking water. Considering residence, almost three quarters (73 percent) of the households in the urban area had access to an improved source while almost two thirds (63 percent) had access in the rural areas. The most common single source of drinking water is the borehole (49 percent of households).

[1] The categorization into improved and non-improved follows that proposed by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (WHO and UNICEF, 2004).

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, Southern Sudan MIS, 2009

Characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source						
Piped water into dwelling	3.7	0.8	1.3	3.2	0.7	1.2
Piped water into yard/compound	2.7	0.3	0.7	2.6	0.3	0.7
Public tap/standpipe	11.2	4.5	5.6	12.7	4.9	6.4
Borehole	46.4	49.9	49.3	44.4	49.3	48.4
Protected dug well	6.2	5.1	5.3	6.9	5.2	5.5
Protected spring	2.5	1.2	1.4	2.7	1.2	1.5
Rainwater	*0.0*	1.3	1.1	0.3	0.1	0.2
Total Improved Source	**72.7**	**63.1**	**64.7**	**72.8**	**61.7**	**63.9**
Non-improved source						
Unprotected dug well	2.1	13.8	11.8	2.0	12.2	10.2
Unprotected spring	2.3	5.1	4.6	2.3	5.1	4.6
Tanker truck/cart with drum	18.9	3.5	6.1	18.8	3.6	5.2
Surface water	3.5	14.1	12.3	3.8	15.7	13.4
[1] Bottled water	0.4	0.1	0.1	0.3	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of Households/Population	**481**	**2,315**	**2,796**	**3,463**	**14,424**	**17,887**

[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.

2.3.2 Household Sanitation Facilities

Ensuring adequate sanitation facilities is one of the Millennium Development Goals. Households without proper sanitation facilities are more exposed to the risk of diseases like dysentery, diarrhea, and typhoid fever than those with improved sanitation facilities. Table 2.4 presents data on type of toilet facilities used by the household. Only 29 percent of the households in Southern Sudan have a toilet facility regardless of the type, while the remaining (71 percent) have no facility or use the bush or the field. Rural households were more likely to have no toilet facility (79 percent) as compared to their urban counterparts (34 percent).

Table 2.4: Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Southern Sudan MIS, 2009

Type of toilet/latrine facility	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Flush toilet	4.1	2.9	2.2	3.8	2.8	3.0
Pit latrine						
Private	45.1	10.3	16.3	45.9	10.2	17.1
Shared	13.1	4.8	6.2	13.4	4.9	6.5
Composting toilet	3.5	1.0	1.5	3.8	0.9	1.0
No facility/bush/field	33.7	78.7	71.0	32.8	78.5	69.6
Other	0.4	2.1	1.8	0.4	2.6	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	**481**	**2,315**	**2,796**	**3,463**	**14,424**	**17,887**

2.3.3 Housing Characteristics

Table 2.5 presents information on a number of characteristics of the dwelling in which the households live. These characteristics reflect the household's socioeconomic situation. They also may influence environmental conditions—for example, in the case of the use of biomass fuels, exposure to indoor pollution—that have a direct bearing on the health and welfare of household members.

Only five percent of households in the Southern Sudan have electricity with urban households having a share of 20 percent and rural households only 2 percent.

About 90 percent of households live in dwellings with earth, sand or dung floors (natural), while the remaining 10 percent live in dwellings with rudimentary or finished floors. These include floors with concrete, cement, wood, carpet or tile material. Urban households have about 11 percent of their floors with cement while there are almost no households in the rural areas with cemented floors. This information is important because flooring material used in dwellings is not only an indicator of household wealth status, but also an indicator of the quality of the health environment in which the household lives because certain rudimentary materials like earth, sand, and cow dung propagate vectors for disease causing parasites and germs. These materials are, in addition, a source of dust and are difficult to clean.

Table 2.5 also shows the distribution of households by the type of fuel used for cooking. Eighty three percent of households in Southern Sudan use wood for fuel while 14 percent use charcoal. Overall, almost all households use solid fuel[2] for cooking. There are virtually no households that use electricity or gas.

[2] Solid fuel includes charcoal, wood (firewood), straw, shrub, grass and animal dung.

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, Southern Sudan, MIS, 2009

	Households			Population		
Housing characteristic	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	19.5	2.4	5.3	21.6	2.9	6.5
No	80.5	97.6	94.7	78.4	97.1	93.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth/sand	76.9	81.8	81.0	78.4	82.9	82.0
Dung	5.4	9.6	8.8	4.4	8.9	8.0
Wood planks	1.9	2.1	2.0	1.4	1.8	1.7
Palm/Bamboo	1.7	2.8	2.6	1.2	2,5	2.2
Parquet or polished wood	2.1	2.0	2.0	2.6	2.0	2.1
Vinyl or asphalt strips	0.2	0.0	0.0	0.2	0.0	0.0
Ceramic tiles	0.4	0.0	0.1	0.7	0.0	0.1
Cement	10.8	0.7	2.5	10.8	1.0	2.9
Carpet	0.2	0,2	0.2	0.0	0.1	0.1
Other	0.4	0.9	0.8	0.3	0.8	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Electricity	0.0	0.0	0.0	0.0	0.0	0.0
LPG/natural gas/biogas	0.2	0.0	0.1	0.8	0.3	0.4
Kerosene	0.2	0.0	0.1	0.1	0.0	0.0
Charcoal	59.0	4.1	13.6	60.1	4.4	15.2
Firewood	38.1	92.5	83.1	36.6	91.6	80.9
Straw/grass	1.9	2.9	2.8	2.5	3.5	3.1
Dung	0.0	0.2	0.2	0.0	0.0	0.0
Other fuel	0.0	0.1	0.1	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	99.0	99.7	99.7	99.1	99.7	99.6
Number of households/population	**481**	**2,316**	**2,797**	**3,463**	**14,424**	**17,887**
Total	100.0	100.0	100.0	100.0	100.0	100.0

LPG = Liquid petroleum gas

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

2.4 HOUSEHOLD POSSESSIONS

The 2009 SSMIS collected information about household ownership of certain durable goods. 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 mass media and innovative ideas; a refrigerator prolongs the wholesomeness of foods; and a means of transport allows greater access to many

services that may be unavailable locally. Table 2.6 shows the availability of selected consumer goods by residence.

Thirty percent of households have a radio while 5 percent own a television. The households that own mobile phones are 18 percent. There is noticeable urban-rural variation in the proportion of households owning these durable goods, and this is important to highlight since these are key channels for communicating malaria messages. For example 65 percent of households in urban areas own a radio compared to 23 percent of rural households, while for television, 24 percent own in urban areas compared to less than one percent of rural households. Ownership of a bicycle was reported by 27 percent of the households while 6 percent own motorcycles. The proportion of households owning the other durable goods i.e. refrigerator, generator, air condition, fan etc is about two percent or less in almost all cases. About two-thirds of the households reported owning animals.

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, Southern Sudan, MIS, 2009

	Households			Population		
Possession	Urban	Rural	Total	Urban	Rural	Total
Household effects						
Radio	64.7	23.2	30.3	69.9	24.6	33.4
Television	23.5	0.8	4.7	26.9	1.1	6.1
Mobile telephone	60.5	9.0	17.9	64.5	10.7	21.1
Non-mobile telephone	7.9	0.9	2.1	9.8	1.1	2.8
Refrigerator	7.7	0.1	1.4	10.2	0.2	2.2
Satellite Dish	11.0	0.2	2.0	13.7	0.3	2.9
Air Conditioner/Cooler	4.9	0.1	0.9	6.4	0.2	1.4
Fan	8.1	0.2	1.6	9.9	0.2	2.1
Computer	6.0	0.1	1.1	8.6	0.1	1.7
Generator	10.4	0.5	2.2	13.1	0.8	3.1
Means of transport						
Bicycle	35.3	24.9	26.7	39.7	26.0	28.6
Animal drawn cart	1.7	0.3	0.5	1.9	0.2	0.6
Motorcycle/scooter	18.1	3.1	5.7	20.1	3.7	6.9
Car/truck	7.3	0.4	1.6	8.9	0.5	2.2
Boat	0.4	0.8	0.8	0.6	1.2	1.1
Ownership of animals[1]	38.3	71.8	66.0	42.2	73.4	67.6
Number	**481**	**2,315**	**2,796**	**3,463**	**14,424**	**17,887**

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

2.5 WEALTH INDEX

The wealth index is a background characteristic that is used throughout this report as a proxy for long-term standard of living of the household. It is calculated using data on household's ownership of consumer goods, dwelling characteristics, source of drinking water, sanitation facilities, and other characteristics that are related to a household's socioeconomic status. To construct the index, each of these assets was assigned a weight (factor score) generated through principal component analysis, and the resulting asset scores were standardized in relation to a standard normal distribution with a mean of zero and standard deviation of one (Gwatkin et al., 2000). Each household was then assigned a score for each asset, and the scores were summed for each household. Individuals were ranked according to the total score of the household in which they resided. The sample was then divided into quintiles from one (lowest) to five (highest). A single asset index was developed on the basis of data from the entire country sample and this index is used in all the tabulations presented.

Table 2.7 shows the distribution of the de jure household population into five wealth levels (quintiles) based on the wealth index by urban-rural residence as well as by region. These distributions indicate the degree to which wealth is evenly (or unevenly) distributed by geographic areas.

The table shows that urban respondents and those in the Equatoria region are much more likely to fall in the higher wealth quintiles. Only 2 percent of the urban population falls in the lowest wealth quintile, compared to 39 percent of the rural population. Similarly, 60 percent of the residents in the Equatoria region fall in the fourth and highest quintile while about 44 percent of the residents of Upper Nile fall into the poorest quintile. Only 13 percent of the residents of Upper Nile and Bahr el Ghazal fall in the highest wealth quintile.

Table 2.7: Wealth quintiles

Percent distribution of the de jure population by wealth quintiles according to residence and region, Southern Sudan MIS, 2009

	Wealth quintile						Number of
Residence/region	Lowest	Second	Middle	Fourth	Highest	Total	population
Residence							
Urban	2.2	2.8	5.0	19.8	70.0	100.0	3,463
Rural	39.2	15.8	16.6	20.3	8.1	100.0	14,424
Region							
Upper Nile	44.0	10.8	15.8	16.9	12.8	100.0	6,175
Bahr el Ghazal	30.8	18.6	19.1	18.4	13.1	100.0	5,732
Equatoria	20.9	10.9	8.3	25.6	34.3	100.0	5,980
Total	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**	**100.0**	**17,887**

2.6 CHARACTERISTICS OF WOMEN RESPONDENTS

2.6.1 General Characteristics

Age is a fundamental variable in analyzing demographic phenomena, but it is one of the most difficult to obtain when written records of events (especially civil status data) are far from exact or do not exist at all. Special efforts were made in the individual questionnaire to record respondents' correct age. Respondents were asked for both their month and year of birth and their age.

Table 2.8 presents the distribution of women aged 15-49 by age group, religion, urban-rural residence, region, education level, and wealth quintile. Generally, the proportion of respondents in each age group declines as age increases, reflecting the comparatively young age structure of the population with the exception of the age-group 25-29 which has almost a quarter (24 percent) of all the women in the eligible category . The slightly lower proportion of women age 15-19 than age 20-24 could be probably due to deliberately displacing the ages of these adolescents by interviewers to avoid having to do an individual interview.

Almost 9 in 10 Southern Sudan women are Christian, while 4 percent are Muslim. Six percent of the women belonged to other faiths i.e. neither Christian nor Muslim.

The majority of the interviewed women are in the lowest (29 percent) and the highest (25 percent) wealth quintiles while the second and third quintiles have the smallest proportions of women.

Table 2.8: Percent distribution of women ages 15–49 years by background characteristics, Southern Sudan MIS, 2009

Background characteristic	Percent	Number
Ages		
15–19	16.4	499
20–24	20.3	616
25–29	24.4	743
30–34	16.0	487
35–39	11.9	363
40–44	6.6	202
45–49	4.3	132
Total	100.0	3,042
Residence		
Rural	78.9	2,400
Urban	21.1	642
Total	100.0	3,042
Region		
Upper Nile	33.0	1,004
Bahr el Ghazal	30.4	927
Equatoria	36.6	1,111
Total	100.0	3,042
Education		
None	73.2	2,225
Primary	20.8	631
Secondary/University	4.9	150
Other/Missing	1.1	36
Total	100.0	3,042
Religion		
Christian	89.1	2,710
Muslim	3.8	114
Other	5.9	179
Not Stated/Missing	1.2	39
Wealth Quintile		
Lowest	28.9	869
Second	12.4	384
Middle	13.6	423
Fourth	20.2	614
Highest	24.9	752
Total	100.0	3042

2.6.2 Education 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 a woman has attained, the more knowledgeable she is about the use of health facilities, family planning methods, and the health of her children. The education system in Southern Sudan has been unstable for sometime because of the civil crisis; however, recently a major restructuring of the infrastructure and program is being undertaken by the government. Presently, the government of Southern Sudan has adopted a free primary education policy in all government schools.

Table 2.9 presents an overview of the relationship between the respondent's level of education and other background characteristics.

The results show that majority of women (73 percent) have no education and only 21 percent have attended primary. Younger women are more likely than older women to have some education. For example, only 48 percent of women aged 15-19 years have never been to school, compared with 86 percent of women age 45-49 years. Younger women are more likely than older women to have some secondary education. By urban-rural residence, urban women are better educated than rural women.

Considering regions, Equatoria has a slightly lower proportion of women (63 percent) with no education as compared to other regions. This region has a higher percentage of women with primary and secondary education i.e. 28 and 9 percent respectively as compared to 15 and 2 percent for Upper Nile.

Table 2.9 also shows that poorer women tend to be less educated compared to richer women. Over 9 in 10 of the women in the lowest wealth quintile have no education while there is almost no woman in the lowest wealth quintile with secondary education. Almost all women with secondary education and above fall in the highest quintile.

Table 2.9: Educational attainment
Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median year completed, according to background characteristics, Southern Sudan MIS, 2009

Background characteristic	No schooling	Primary	Secondary & above	DK/Missing	Number
Ages					
15–19	48.2	44.8	6.0	1.0	498
20–24	70.8	21.3	7.1	0.8	616
25–29	80.1	14.6	4.0	1.3	742
30–34	82.1	13.6	2.9	0.5	486
35–39	79.3	15.2	4.0	1.5	363
40–44	77.2	13.9	6.9	2.0	202
45–49	85.6	8.3	5.3	0.8	133
Residence					
Rural	80.9	15.8	2.1	1.2	2,398
Urban	44.2	39.4	15.6	0.8	642
Region					
Upper Nile	80.9	15.4	2.2	1.5	1,004
Bahr el Ghazal	77.4	18.0	3.7	0.9	927
Equatoria	62.8	27.9	8.5	0.8	1,109
Wealth Quintile					
Lowest	91.2	7.2	0.0	1.6	869
Second	88.7	10.4	0.3	0.6	384
Middle	81.9	15.8	0.8	1.5	421
Fourth	68.5	27.8	3.0	0.7	614
Highest	42.6	39.1	17.2	1.1	752
Total	**73.2**	**20.8**	**5.0**	**1.0**	**3,040**

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 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 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[3] during the pregnancy for the most recent birth, according to background characteristics.

The data shows that slightly over half of the mothers (55 percent) receive antenatal care from a health professional (doctor, nurse or midwife) while 38 percent did not see anyone. Younger women were more likely to see a skilled provider than older ones. Urban mothers are also more likely than rural mothers to receive antenatal care from health professionals than rural women. Compared to women in other regions, women in the Upper Nile Region are relatively less likely to receive ANC services from a skilled provider.

There is a noticeable difference in use of antenatal care services as regards women's educational level. Ninety-three percent of mothers with secondary education and above receive antenatal care services from a skilled provider, compared with only 44 percent of mothers with no education.

Women in the highest wealth quintiles are very likely to see a skilled provider than those in lower quintiles. For example 90 percent of women in the highest quintile saw a skilled provider compared to only 31 percent in the lowest wealth quintile.

[3] For the 2009 SSMIS, if a woman received antenatal care from more than one provider, all the providers were recorded.

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 health care provider for the most recent birth, according to background characteristics Southern Sudan MIS, 2009

Background characteristic	Health Professional	Doctor	Midwife	Nurse	Community Health Worker	Traditional Birth Attendant	No one	Other	Number of Women
Residence									
Rural	45.6	13.1	23.7	8.8	7.5	3.5	41.7	1.7	1,544
Urban	77.8	17.2	52.0	8.6	2.0	1.0	19.3	0.3	348
Region									
Upper Nile	38.3	14.8	9.0	14.5	12.8	2.3	45.3	1.3	689
Bahr el Ghazal	48.0	25.4	17.2	5.4	1.9	3.4	45.6	1.1	535
Equatoria	67.8	3.6	58.7	5.5	3.7	3.4	23.2	1.8	668
Age									
15-19	54.5	13.1	31.7	9.7	6.9	2.8	34.5	1.4	145
20-24	57.4	18.5	30.6	8.3	6.3	2.7	31.5	2.2	448
25-29	49.8	12.7	27.8	9.3	7.4	3.9	36.8	2.1	568
30-34	50.4	12.5	27.4	10.5	5.4	2.3	41.9	0.0	351
35-39	51.1	13.4	31.4	6.3	3.4	3.8	40.6	1.3	239
40-44	42.4	7.6	26.1	8.7	11.9	2.2	43.5	0.0	92
45-49	36.8	10.2	22.5	4.1	10.2	0.0	53.1	0.0	49
Education									
No schooling	44.3	13.8	22.1	8.4	8.1	3.0	42.8	1.8	1,450
Primary	75.1	13.3	51.0	10.8	1.1	3.2	20.2	0.3	361
Sec & Above	93.0	22.8	68.4	1.8	0.0	1.8	5.3	0.0	57
DK/Missing	*	*	*	*	*	*	*	*	24
Wealth index									
Poorest	31.4	12.3	11.4	7.7	9.2	2.7	53.9	2.7	599
Second	37.0	11.0	19.5	6.5	11.8	4.5	44.7	2.0	258
Middle	49.1	19.5	22.2	7.4	5.1	4.4	42.6	1.2	255
Fourth	68.9	13.1	45.6	10.2	4.6	3.2	27.2	0.3	368
Richest	89.5	20.1	60.0	9.4	0.8	1.0	16.6	0.3	412
Total	**55.0**	**13.8**	**28.9**	**8.8**	**6.5**	**3.0**	**37.6**	**1.4**	**1,892**

* Observations less than 25 to make valid conclusions

3.2 WOMEN'S KNOWLEDGE OF MALARIA

3.2.1 Knowledge of Causes of Malaria

Ignorance of how malaria is spread obstructs the ability to take appropriate preventive measures. The survey asked eligible women several questions to find out their knowledge on causes of malaria. Table 3.2 presents information on responses provided by women 15-49 years when asked what causes malaria.

Fifty-eight percent said that malaria is caused/transmitted by mosquitoes, 27 percent said malaria is caused by working in the sun while 13 percent said it is caused by drinking dirty water. There exist some differences by background characteristics though not large; women in the age-group 30-39 are more likely to mention mosquitoes as the cause of malaria compared to other

women. The data also show that women with higher education and those in higher wealth quintiles are more likely than the less educated and the less wealthy women to mention mosquitoes as cause of malaria. For example 91 percent of women with education level of secondary and above mention mosquitoes as cause of malaria compared to 53 percent with no education. Urban women (74 percent) were also more likely to know mosquitoes as a major cause of malaria than their rural counterparts (54 percent). The proportion of women who did not cite a specific cause of malaria was 22 percent and this was highest among women with no education, rural women, older women and those in the lowest wealth 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 Southern Sudan MIS, 2009

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	59.4	26.4	12.7	4.3	10.3	1.6	2.0	23.1	493
20-24	56.3	27.6	13.9	3.5	10.8	1.5	0.8	23.6	609
25-29	57.4	30.4	13.3	4.9	8.9	1.0	1.9	19.9	738
30-34	59.4	23.3	13.5	3.1	9.4	0.6	0.6	19.8	480
35-39	59.6	24.5	12.0	3.3	10.6	0.6	3.3	21.7	359
40-44	57.9	19.8	5.5	3.5	5.9	0.5	2.0	25.4	202
45-49	55.0	27.9	7.8	4.7	14.7	0.8	1.6	26.8	130
Residence									
Rural	53.7	28.2	13.8	4.1	10.4	1.3	1.3	24.0	2,373
Urban	73.5	20.4	7.4	3.3	8.0	0.0	1.1	15.3	638
Region									
Upper Nile	53.3	29.3	9.1	3.0	4.0	1.1	1.6	23.6	997
Bahr el Ghazal	60.4	29.7	21.8	5.3	11.4	1.3	2.9	21.5	911
Equatoria	60.2	24.4	7.7	3.6	13.9	0.7	0.7	21.4	1,103
Education									
No education	52.8	27.8	13.1	4.0	9.2	1.0	1.5	24.5	2,199
Primary	69.0	22.4	10.1	3.1	12.1	1.1	2.2	17.7	629
Sec & Above	91.3	22.2	13.4	5.4	11.4	0.7	1.3	2.0	149
DK/Missing	*	*	*	*	*	*	*	*	34
Wealth index									
Poorest	46.6	27.2	12.1	5.1	8.0	1.1	1.0	30.2	859
Second	53.4	22.8	14.9	2.8	7.7	0.8	0.6	25.1	389
Third	58.6	32.9	17.9	3.3	11.7	1.5	3.8	17.9	414
Fourth	57.7	27.2	12.2	2.9	11.4	1.4	2.0	19.6	602
Richest	72.1	23.9	9.4	4.5	11.3	0.7	1.2	15.3	747
Total	**58.0**	**26.5**	**12.5**	**3.9**	**9.9**	**1.0**	**1.9**	**22.1**	**3,011**

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 of ways to avoid getting malaria were further asked to name specific ways to avoid getting malaria. Table 3.3 shows responses provided by women 15-49 years on ways to avoid getting malaria.

Sixty-six percent of women mentioned at least one way to avoid getting malaria. Urban women and those with higher education are more likely to know at least one way of avoiding malaria than rural women and those with no education. Further, women in wealthier quintiles are more likely to know ways of avoiding malaria than those in lower wealth quintiles. Women in Upper Nile (64 percent) are notably less likely than average to say that there are ways to avoid getting malaria.

When asked to cite specific ways to avoid getting malaria, 34 percent of women said sleeping under an insecticide treated mosquito net, and the same proportion (34 percent) said sleeping under any mosquito net, 12 percent mention taking preventative medicine while only 3 percent say destroying mosquito breeding sites as ways to avoid getting malaria. A small proportion (5 percent) cited spraying house with insecticide. Twenty-six percent of the women did not know any specific way for avoiding malaria. Rural women, those with no education and women in the lowest quintile are less likely to know ways to avoid malaria than urban women, highly educated women and those from the higher wealth quintiles.

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 Southern Sudan MIS, 2009

Background characteristic	Any preventative way	Sleeping under a bednet	Sleeping under an insecticide treated net	Taking preventative medication	Spraying walls of a house with insecticide	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	65.7	33.7	33.3	12.4	5.5	2.8	2.8	3.7	8.9	26.8	493
20-24	62.1	33.2	30.7	14.6	5.4	2.3	4.4	2.5	8.4	29.1	609
25-29	67.1	36.6	34.1	11.8	5.3	3.5	3.1	3.8	10.8	23.6	738
30-34	69.6	32.7	36.7	10.8	4.0	3.8	3.1	2.3	8.3	21.5	480
35-39	67.7	34.3	36.8	11.4	6.1	5.3	4.2	3.0	10.9	26.2	359
40-44	65.4	34.7	28.7	8.4	3.0	4.5	1.5	2.6	5.5	27.2	202
45-49	63.6	31.8	31.0	11.6	2.3	5.4	3.8	1.6	8.5	24.8	130
Residence											
Rural	62.4	29.8	34.2	13.3	5.4	3.7	3.5	3.1	9.3	27.6	2,373
Urban	79.5	50.5	31.0	7.4	3.3	3.1	2.8	3.1	8.6	17.6	638
Region											
Upper Nile	63.6	30.0	34.5	7.7	4.4	3.6	2.5	4.5	6.7	22.9	997
Bahr el Ghazal	67.0	28.0	41.5	20.9	8.6	4.9	4.1	3.3	8.9	22.3	911
Equatoria	67.5	43.1	26.0	8.6	2.5	2.4	3.6	1.6	11.6	26.0	1,103
Education											
No education	61.7	29.8	33.0	12.1	5.0	3.6	2.8	3.4	9.2	28.7	2,199
Primary	74.5	45.2	31.2	10.7	4.0	2.9	4.1	1.9	9.2	18.8	629
Sec & Above	94.0	55.0	48.3	16.1	7.4	5.4	10.1	3.4	9.4	6.7	149
DK/Missing	*	*	*	*	*	*	*	*	*	*	34
Wealth index											
Poorest	54.0	22.9	32.5	10.1	5.0	3.0	2.3	3.8	9.7	36.5	859
Second	59.5	27.0	35.5	9.1	4.4	4.7	2.8	1.4	8.8	27.0	389
Third	68.6	32.7	36.5	18.1	7.7	3.6	2.8	5.1	9.7	21.6	414
Fourth	69.9	38.4	33.8	14.5	4.9	4.1	4.9	2.6	8.7	21.1	602
Richest	77.6	47.2	31.8	11.0	4.0	2.8	4.1	2.6	9.4	18.2	747
Total	**66.0**	**34.2**	**33.5**	**12.0**	**5.0**	**3.6**	**3.4**	**3.0**	**9.2**	**25.5**	**3,011**

3.2.3 Knowledge of Medicines to Use in Treating Malaria

Women were further asked to cite specific medicines that can be taken when one gets malaria. Forty one percent of the women know the correct treatment when one has malaria. Women with secondary education and those in the higher wealth quintile were more likely to know the correct treatment of malaria than those with no education and those in the lower wealth quintiles. Women in Bahr el Ghazal were less likely to know any medicine to take for malaria than those from Equatoria and Upper Nile Regions. Overall, 14 percent know Artesunate + Amodiaquine, 9 percent know Co-artem, 22 percent mentioned Quinine, 18 percent mentioned Chloroquine and only a small proportion of women (6 percent) reported SP/Fansidar as a drug used to treat malaria. Results are presented in Table 3.4.

Women in Upper Nile (27 percent) were more likely to know AS+AQ as treatment for malaria than their counterparts in Equatoria and Bahr el Ghazal (7 and 8 percent respectively). More than one third of the women (35 percent) did not know any medicine to take when one gets malaria.

Table 3.4. Knowledge of antimalaria 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 Southern Sudan MIS, 2009

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	44.6	11.4	10.1	4.1	25.4	5.3	15.0	5.9	14.8	34.9	493
20-24	41.9	12.5	10.2	5.1	24.5	6.7	18.4	5.4	16.4	35.5	609
25-29	40.5	15.9	8.0	2.7	22.4	6.1	18.4	7.2	15.9	33.7	738
30-34	43.1	19.2	10.2	4.2	19.2	6.3	17.9	7.3	12.5	35.0	480
35-39	36.7	11.7	9.2	5.6	18.9	8.9	18.1	6.4	10.9	39.2	359
40-44	36.6	12.4	9.4	4.5	15.8	7.4	15.8	5.9	10.9	37.1	202
45-49	42.6	10.9	8.5	4.7	24.8	4.0	20.2	3.1	18.6	34.1	130
Residence											
Rural	37.8	13.7	8.2	3.3	21.2	4.7	18.0	6.0	14.6	40.3	2,373
Urban	54.2	15.1	13.8	7.4	25.2	12.9	16.3	6.4	13.8	17.2	638
Region											
Upper Nile	43.9	26.7	11.0	3.5	8.0	6.8	11.2	5.2	8.5	32.2	997
Bahr el Ghazal	34.1	7.1	8.5	5.9	22.6	8.3	18.8	5.2	11.1	41.5	911
Equatoria	44.7	8.3	8.7	3.4	34.2	4.5	22.5	8.2	22.6	33.3	1,103
Education											
No education	36.5	14.3	6.6	4.0	19.2	5.4	16.2	5.4	13.7	40.5	2,199
Primary	51.0	12.4	14.5	4.9	28.3	8.3	20.0	8.1	16.2	25.1	629
Sec & Above	67.8	12.8	29.5	4.7	38.3	16.1	24.8	13.4	17.5	6.7	149
DK/Missing	*	*	*	*	*	*	*	*	*	*	34
Wealth index											
Poorest	29.8	11.3	5.1	3.3	16.3	6.4	16.9	5.4	12.6	46.5	859
Second	31.4	12.7	6.3	3.3	18.7	3.5	12.7	5.5	12.4	49.3	389
Third	42.6	17.4	5.9	2.8	21.4	3.1	18.9	3.8	16.8	35.7	414
Fourth	43.2	17.4	11.2	3.9	21.3	6.6	17.5	6.8	14.8	32.5	602
Richest	55.8	12.8	14.3	6.9	32.6	9.9	21.9	9.4	17.3	17.9	747
Total	**41.3**	**14.0**	**9.4**	**4.2**	**22.1**	**6.4**	**17.6**	**6.3**	**14.5**	**35.4**	**3,011**

3.4 MANAGEMENT OF FEVER AMONG CHILDREN

Most fevers occur at home and they can rapidly progress into severe illness if prompt and effective treatment is not accessed at the shortest possible time.

3.4.1 Prevalence and Treatment of Fever in Children

The 2009 SSMIS asked mothers whether any child under five years 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, the number of days after onset of fever and when advice or treatment was sought. Table 3.5 shows the percentage of children under five who had fever in the two weeks preceding the survey, and the actions taken for them.

About 35 percent of children under five had a fever in the two weeks preceding the survey. The prevalence of fever is lowest in the Bahr el Ghazal with 19 percent of the children having suffered from fever and highest in Equatoria region with 52 percent. There is very little difference in the prevalence of fever between the rural and urban children (35 vs 33 percent respectively). Younger children i.e. those less than two years were more likely to suffer from fever than older children.

Findings reveal that advice or treatment from a health facility or provider was sought for 52 percent of children with a fever in the two weeks preceding the survey. Children from Equatoria region, urban areas, those with mothers having education level of secondary and above and those from the richest wealth quintile were more likely to seek advice or treatment from a health facility or health care provider than the rest. Thirty-six percent took some type of anti-malarial drug; a higher proportion of younger children, children from urban areas, those from Equatoria Region, children from wealthier quintiles and those with mothers with education level higher than primary took anti-malarial drugs compared to the rest. It is worth noting, however, that only 11 percent took anti-malarial drugs on the same or next day after falling sick.

Mothers were further asked whether children with fever had blood taken from a finger or heel for testing, the results show that only 27 percent of children with fever were reported to have had blood taken from a finger or heel for testing. Urban children, those from wealthier quintile, children from Equatoria region and those with mothers having secondary education or above had had a blood test compared to rural children, children from poorer quintiles, children from other regions, and those with mothers with education level lower than secondary. The results do not show any special trend when considering age of child.

Table 3.5: Prevalence and 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 health care provider, the percentage who had blood taken from finger or heel for testing, the percentage who took antimalaria drugs and the percentage who took the antimalaria drugs the same or next day following the onset of fever, by background characteristics Southern Sudan MIS, 2009

Background characteristic	Among children under age 5:		Among children age 5 with fever					
	Percent with fever in the two weeks preceding the survey	Number of Children	Percentage for whom advice was sought from Health facility or Health care provider	Percentage who reported having blood taken from finger or heel for testing	Percent age who took any drugs	Percentage who took antimalaria drugs	Percentage who took antimalaria drugs same or next day	Number of children with fever
Age of child								
0-11 mths	38.9	483	53.6	20.5	55.0	37.1	13.2	189
12-23 mths	46.1	550	55.4	27.1	54.3	37.2	13.8	226
24-35 mths	34.1	667	51.9	33.3	55.8	37.9	8.1	210
35-47 mths	33.9	623	49.1	21.1	41.6	34.2	11.8	197
48-49 mths	31.5	632	54.5	26.9	52.4	33.5	11.9	166
Residence								
Rural	35.4	2,416	49.0	23.2	47.2	32.9	10.6	817
Urban	33.2	539	66.5	48.3	74.9	49.7	15.1	171
Region								
Upper Nile	30.1	1,121	38.0	19.5	37.2	24.6	2.3	323
Bahr el Ghazal	19.1	792	37.1	15.2	33.1	16.6	0.5	145
Equatoria	52.3	1,042	64.8	35.4	66.3	35.8	20.2	520
Education								
No education	33.0	2,291	46.0	23.8	46.6	31.6	8.7	726
Primary	42.4	535	66.5	39.3	64.0	45.8	18.5	214
Sec & Above	45.6	90	(82.9)	(55.0)	(87.8)	(64.3)	(22.0)	40
DK/Missing	*	39	*	*	*	*	*	8
Wealth index								
Poorest	33.9	913	37.3	16.3	37.8	27.1	5.9	247
Second	29.6	398	44.6	26.2	45.4	35.7	7.1	101
Third	29.7	414	49.6	23.6	41.2	25.6	7.7	151
Fourth	40.4	595	54.7	28.8	56.0	37.5	14.7	222
Richest	39.1	635	73.4	41.7	75.6	51.0	19.5	233
Total	**35.0**	**2955**	**52.0**	**27.2**	**52.1**	**35.8**	**11.4**	**988**

3.4.2 Type of anti-malarial drug use among children

The types of anti-malarial drugs given to children to treat fever are provided in Table 3.6. Fifteen percent of children under 5 years who had fever in the two weeks preceding the survey took an AS+AQ, while 8 percent took quinine for the management of the fever. Use of ACT is still very low and there is no special pattern as far as age of child is concerned. Only 4 percent of children with fever in Bahr el Ghazal took AS+AQ compared to 15 and 18 percent in Upper Nile and Equatoria regions respectively.

Table 3.6: Type of antimalaria drugs

Among children under age 5 with fever in the two weeks preceding the survey, percentage who took specific antimalaria drugs after developing the fever, by background characteristics, Southern Sudan MIS 2009

Background characteristic	AS+AQ	Coartem	Artesunate + SP	Quinine	Artemether	Chloroquine	SP (Fansidar)	Paracetamol (Panadol)	Number of Children with fever
Age of Child									
0-11 mths	9.8	2.3	2.3	6.9	1.2	6.4	1.7	7.5	189
12-23 mths	16.1	2.3	1.8	9.6	4.1	4.5	0.9	4.6	226
24-35 mths	15.5	1.0	0.5	9.7	3.9	4.4	1.9	5.8	210
35-47 mths	12.4	3.0	1.2	6.5	4.7	2.4	1.2	1.2	197
48-59 mths	8.2	2.7	0.0	8.2	5.4	4.8	0.0	4.8	166
Residence									
Rural	15.0	2.2	0.7	6.7	2.3	3.6	1.2	4.3	817
Urban	15.1	1.1	2.8	15.6	8.4	5.6	0.6	6.2	171
Region									
Upper Nile	15.4	1.2	0.9	0.3	1.8	1.5	1.5	5.0	323
Bahr el Ghazal	4.0	0.0	2.7	0.7	4.6	2.7	0.0	4.6	145
Equatoria	17.8	3.1	0.7	15.2	4.0	5.9	1.1	4.4	520
Education									
No education	13.5	1.5	1.1	6.9	2.5	4.1	0.8	4.4	726
Primary	18.1	4.0	1.3	12.3	4.0	4.0	2.2	4.4	214
Sec & Above	26.8	2.4	0.0	12.2	17.1	2.4	0.0	9.8	40
DK/Missing									8
Wealth index									
Poorest	12.9	0.9	0.7	3.6	3.0	3.6	0.7	1.0	247
Second	11.6	0.9	0.9	8.0	5.4	6.3	0.0	4.5	101
Third	12.8	0.0	0.0	5.1	1.7	1.7	1.7	7.7	151
Fourth	21.1	1.3	0.9	7.7	0.9	4.7	0.9	5.6	222
Richest	13.7	5.0	2.5	17.0	6.6	3.7	2.1	7.1	233
Total	**15.0**	**2.0**	**1.1**	**8.2**	**3.4**	**4.0**	**1.1**	**4.7**	**988**

3.4.2 Place Where Treatment was Sought

Mothers who reported to have sought advice or treatment from a health facility or provider for fever in a child were asked about the place where care was sought for the child. Findings are presented in Table 3.6. Most of the children were taken to government facilities (56 percent) for hospital, health centre or health unit while only 11 percent were taken to a private hospital or clinic. Nine percent visited Community Health Workers whereas seven percent went to pharmacies. Children from urban areas (46 percent) were more likely to be taken to a government hospital than rural children.

Considering regions, 35 percent of children from Upper Nile were sent to a government health centre as compared to only 8 percent from Bahr el Ghazal. Women with education level of secondary and above (36 percent) were more likely to take their sick children to government hospitals compared to those with lower education levels. Children of wealthier mothers tend to send their children to a private hospital or clinic (19 percent) compared to mothers from poorer quintiles.

Table 3.6: Source of treatment

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, Southern Sudan MIS 2009

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	Other/Missing	
Residence													
Rural	22.1	19.9	14.2	4.1	11.3	12.6	6.1	0.7	0.0	2.3	1.1	4.3	443
Urban	46.3	9.6	0.7	7.4	1.5	7.4	11.8	2.2	1.3	1.5	0.7	11.0	136
Region													
Upper Nile	27.7	35.0	16.1	0.0	3.7	2.9	4.4	1.5	1.5	0.7	0.0	6.6	137
Bahr el Ghazal	24.6	7.7	9.2	4.6	20.0	9.2	9.2	3.1	0.0	4.6	0.0	7.7	65
Equatoria	28.3	12.7	9.6	6.6	9.0	14.9	8.2	0.5	1.1	2.1	1.6	5.3	377
Mother's Education													
No Education	27.7	17.3	12.3	4.8	9.9	9.9	7.2	0.5	0.8	2.7	0.8	5.9	375
Primary	26.8	19.1	8.3	4.8	7.7	13.7	6.6	1.2	1.8	1.2	1.8	7.1	168
Sec and Above	36.4	12.1	6.1	6.1	3.0	15.5	15.2	6.1	0.0	0.0	0.0	0.0	33
Wealth Quintile													
Lowest	29.2	25.6	15.9	1.8	4.4	3.5	9.7	1.8	0.9	1.8	0.0	0.0	113
Second	21.8	25.5	14.6	0.0	14.6	12.7	0.0	0.0	0.0	7.3	0.0	0.0	55
Middle	26.4	23.6	15.3	4.2	9.7	2.8	9.7	0.0	1.4	0.0	0.0	4.2	72
Fourth	22.7	11.3	13.3	3.3	14.7	13.3	6.0	6.0	0.7	2.0	3.3	1.3	150
Highest	33.7	9.7	4.0	10.3	4.6	18.9	9.1	1.1	1.7	1.1	0.6	5.1	175
Total	**27.8**	**17.4**	**11.1**	**4.8**	**9.0**	**11.4**	**7.4**	**1.0**	**1.0**	**2.1**	**1.0**	**5.9**	**579**

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. The Government of Southern Sudan, through the Ministry of Health, Malaria Control Program with support from a number of partners, has distributed approximately four million insecticide treated mosquito nets across the territory in the last 2-3 years. In addition, education on the importance of nets has increased, leading to a greater demand for nets. Since 2009, PSI Sudan with partner organizations has worked closely with local authorities to sensitize communities on the mass LLIN distribution and importance of using nets. At the time of the survey, LLIN campaigns had already been carried out in about 50 percent of the counties.

4.1.2 Ownership of Mosquito Nets

In this survey, use of nets was assessed in each surveyed household through a complete net roster, which identified each net in the household, brand type, treatment status at the time of the interview and the members of the household who had slept under the net the night preceding the survey and if no one had, the reasons why the net was unused.

Table 4.1 presents information on the percentage of households that have any mosquito net, an insecticide treated net (ITN), and a long-lasting insecticide treated net (LLIN), by residence, region and wealth quintile.

Overall, close to 60 percent of households have at least one mosquito net, 53 percent have at least one insect-treated mosquito net (ITN) and 51 percent have at least one LLIN. Because of the small difference in the percentage of households owning ITNs and LLINs, almost all ITNs owned in Southern Sudan are LLINs. The 2006 SHHS reported only 12 percent of the households owning at least one ITN.

Ownership of LLINs varies widely across regions, ranging from 41 percent of households in Upper Nile region to 59 percent of households in Bahr el Ghazal region owning at least one LLIN. Survey findings also show that the average number of LLINs per household is about 1 in Upper Nile and Equatoria regions and approximately 2 for households in Bahr el Ghazal. This variation in LLIN ownership across the three regions is likely due to LLIN distribution campaigns and NGOs distributing LLINs. Ownership of LLIN is highest in urban areas when compared to rural households.

The table further shows that 25 percent of the households in Southern Sudan have at least one net for every two people. Urban households, those from Bahr el Ghazal and households from the highest wealth quintile were more likely to have more households with one net for every two people than the rest.

Table 4.1: Ownership of Mosquito nets by Households

Percentage of households with at least one net for every two persons, 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, Southern Sudan MIS, 2009

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[2]	Percentage of households that have more than one ITN[2]	Average number of ITNs per household	Percentage of households that have at least one LLIN[3]	Percentage of households than have more than one LLIN[3]	Average number of LLINs per household	Number of households
Residence											
Rural	23.4	57.1	43.8	1.4	50.6	38.2	1.2	47.9	36.6	1.2	2,316
Urban	30.6	69.9	57.4	2.0	65.7	54.3	1.9	63.2	52.3	1.8	481
Region											
Upper Nile	20.6	53.7	41.6	1.4	42.5	31.4	1.0	40.6	30.0	0.9	918
Bahr el Ghazal	30.1	69.0	57.6	1.9	64.6	54.0	1.8	59.4	50.9	1.7	882
Equatoria	23.5	55.9	40.1	1.3	53.0	38.2	1.2	51.8	37.7	1.2	997
Wealth index											
Poorest	22.0	52.1	42.2	1.3	45.6	36.1	1.1	44.1	34.9	1.1	911
Second	23.9	51.4	38.8	1.2	48.1	36.2	1.2	44.8	34.5	1.1	420
Third	24.2	58.5	46.8	1.6	48.7	38.3	1.2	45.8	36.6	1.2	402
Fourth	23.8	64.2	43.9	1.5	58.4	39.7	1.4	53.6	37.4	1.3	569
Richest	31.5	74.3	62.0	2.1	69.7	57.9	2.0	67.9	56.4	1.9	495
Total	**24.6**	**59.3**	**46.1**	**1.5**	**53.2**	**41.3**	**1.3**	**50.6**	**39.3**	**1.3**	**2,797**

[2] An insecticide treated mosquito net (ITN) is 1) a factory-treated net that does not require any re-treatment, 2) a pre-treated/conventional net that requires re-treatment on a six monthly basis.

[3] A long lasting insecticide treated mosquito net (LLIN) is a factory-manufactured pre-treated net that does not require any treatment.

There are several ways to obtain a mosquito net in Southern Sudan: a pregnant woman may receive a mosquito net during routine antenatal care visits; children under five years of age may receive them during routine immunization visits to health facilities; mosquito nets can also be obtained during mass distribution campaigns; and mosquito nets can be purchased directly through various avenues. The percentage distribution of nets by source, according to background characteristics is shown in Table 4.2.

NGOs and Government health facilities are the main sources of mosquito nets for rural households while urban households get the nets from vendors, shops and NGOs. Most households in Bahr el Ghazal (64 percent) receive their mosquito nets from an NGO while only 11 percent of households in Upper Nile get their mosquito nets from NGOs. Thirty one percent of the households who had mosquito nets from Upper Nile bought them from Vendors

Wealthier households are more likely to obtain mosquito nets from vendors and shops than poorer households.

Table 4.2: Source of Mosquito Nets
Percentage distribution of nets by source, according to background characteristics Southern Sudan MIS, 2009

Background characteristic	Government health facility	NGO	Shop	Community based distributor/outreach	Vendor	Others	Don't know/ Missing	Number of Nets
Residence								
Rural	26.4	40.3	10.3	5.0	16.0	0.5	1.2	3,271
Urban	15.7	27.6	22.9	3.1	27.0	1.4	2.1	962
Region								
Upper Nile	29.0	10.7	22.5	5.6	30.9	0.4	0.6	1,277
Bahr el Ghazal	16.2	64.1	8.0	3.3	5.4	0.7	2.2	1,665
Equatoria	29.1	29.2	10.5	5.2	23.2	1.7	1.1	1,291
Wealth index								
Poorest	28.1	37.4	10.8	3.0	17.5	1.1	1.8	1,187
Second	24.1	53.4	7.3	3.8	9.8	0.8	0.9	523
Middle	20.9	43.6	11.8	6.8	15.5	0.2	1.3	613
Fourth	23.0	34.9	11.4	8.2	20.8	0.7	1.0	869
Richest	21.9	27.8	21.0	2.4	23.9	1.4	1.5	1,041
Total	**24.0**	**37.4**	**13.1**	**4.6**	**18.5**	**0.9**	**1.4**	**4,233**

4.1.3 Use of Mosquito Nets by Household Members

The use of mosquito nets by household members is presented in Table 4.3. Only 30 percent of household members in all households (regardless of whether they own any) were reported to have slept under any net the night before the survey, while 24 and 25 percent slept under an ITN or an

LLIN respectively. The proportion of household members who slept under an ITN or LLIN increases with wealth quintile.

Considering persons living in households that own an LLIN, 46 percent slept under an LLIN the night before the survey. The data further shows females were more likely to sleep under al LLIN (49 percent) if the household owned one than males (42 percent). In almost all cases, the proportion of females sleeping under mosquito nets in all households is higher than that for males.

Higher proportions of urban residents also reported sleeping under a mosquito net the night preceding the survey than their rural counterparts. Residents from households that own ITNs or LLINs in Bahr el Ghazal were less likely to sleep under an ITN or LLIN than residents from other regions. For example only 41 percent of residents in Bahr el Ghazal slept under an LLIN when the household own one compared to close to 50 percent in both Equatoria and Upper Nile.

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 mosquito net (ITN), and a long-lasting insecticide treated mosquito net (LLIN) the night before the survey, by background characteristics, Southern Sudan MIS, 2009

Background characteristic	All household individuals in all households				All members in a household with an ITN		All members in a household with an LLIN	
	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	Percentage who slept under an ITN last night[2]	Number of children	Percentage who slept under an LLIN last night[2]	Number
Sex								
Male	27.0	22.7	22.3	7,992	40.5	4,473	42.1	4,239
Female	32.2	26.6	32.7	9,163	47.2	5,155	49.1	4,886
Residence								
Rural	28.2	26.7	22.3	13,698	43.2	7,186	45.1	6,774
Urban	36.0	33.0	26.2	3,457	46.6	2,444	47.9	2,351
Region								
Upper Nile	31.2	21.6	21.4	5,953	47.1	2,726	48.9	2,593
Bahr el Ghazal	29.3	26.2	25.6	5,328	38.5	3,622	41.1	3,319
Equatoria	28.6	26.7	26.4	5,874	47.7	3,280	48.2	3,213
Wealth index								
Poorest	27.5	21.4	21.2	5,465	46.4	2,517	47.8	2,419
Second	25.1	21.6	21.5	2,251	43.4	1,115	46.7	1,030
Middle	30.4	22.0	21.8	2,432	42.7	1,255	45.3	1,169
Fourth	27.7	24.1	23.5	3,435	39.1	2,120	41.4	1,948
Richest	37.7	34.4	33.9	3,572	46.9	2,621	47.2	2,559
Total	**29.8**	**24.8**	**24.4**	**17,155**	**44.1**	**9,628**	**45.8**	**9,125**

[2] An insecticide treated mosquito net (ITN) is 1) a factory-treated net that does not require any re-treatment, 2) a pre-treated/conventional net that requires re-treatment on a six monthly basis.

[3] A long lasting insecticide treated mosquito net (LLIN) is a factory-manufactured pre-treated net that does not require any treatment.

4.1.4 Use of Mosquito Nets by Children Under Five Years

The use of mosquito nets by children under five years of age is summarized in Table 4.4. Only 31 percent of children under five years of age in all households were reported to have slept under any net the night before the survey, while 25 percent slept under an ITN or an LLIN.

Among children living in households that own an LLIN, 48 percent slept under an LLIN the night before the survey. The data further shows that a slightly higher proportion of children in urban areas (49 percent) slept under a mosquito net compared to 47 percent of rural children, the data seem to suggest that children under 2 years of age are more likely than older children to sleep under any mosquito net. For example, while 51 percent of children one year and under in households with an LLIN slept under an LLIN the night before the survey, 44 percent of children 3 years old slept under an LLIN the night before the survey.

The data however does show some regional variation, with only 40 percent of children under 5 years in households with an LLIN in Bahr el Ghazal Region sleeping under an LLIN compared to 54 percent of children in Upper Nile. Although ownership of mosquito nets was reported high in Bahr al Ghazal, use by children under 5 years of age in households which own a net(s) is rather low. Wealth quintile does not seem to have any clear effect on usage of mosquito nets among children under 5 years of age in households with LLIN.

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

Percentage of children under five years of age who slept under a mosquito net (treated or untreated), an insecticide-treated mosquito net (ITN), and a long-lasting insecticide treated mosquito net (LLIN) the night before the survey, by background characteristics, Southern Sudan MIS, 2009

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 night	Percentage who slept under an LLIN last night	Number of children	Percentage who slept under an ITN last night	Number of children	Percentage who slept under an LLIN last night	Number of children
Age (in years)								
<1	35.0	29.5	29.2	617	50.4	359	51.1	350
1	31.5	26.6	26.5	631	48.8	344	50.9	328
2	30.6	23.7	23.1	802	44.5	427	46.7	396
3	29.3	23.8	23.7	827	42.3	466	44.0	446
4	28.3	24.4	21.7	837	45.7	446	47.8	423
Sex								
Male	31.5	26.6	26.3	1,871	47.1	1,058	48.9	1,006
Female	29.9	24.1	23.8	1,843	44.9	984	46.6	937
Residence								
Rural	29.3	23.5	23.2	3,024	45.4	1,568	47.4	1,481
Urban	36.7	33.2	33.0	690	48.1	474	49.1	462
Region								
Upper Nile	34.4	24.3	24.1	1,385	52.3	642	54.4	614
Bahr el Ghazal	28.4	25.7	25.2	976	37.7	666	40.4	609
Equatoria	28.5	26.2	25.9	1,353	48.1	734	48.5	720
Wealth index								
Poorest	29.3	22.2	22.1	1,185	47.6	552	49.4	530
Second	26.1	21.3	21.2	506	43.6	248	47.4	226
Middle	32.8	24.9	24.9	527	51.2	256	54.4	241
Fourth	29.1	26.1	25.6	767	41.5	482	43.4	452
Richest	36.3	32.9	32.2	729	47.2	504	47.2	494
Total	**30.7**	**25.3**	**25.0**	**3,714**	**46.0**	**2,042**	**47.8**	**1,943**

4.1.4 Use of Mosquito Nets by Women

Table 4.5 shows the usage of nets by all women age 15-49 years while Table 4.6 provides similar information for women who were pregnant at the time of the survey.

Thirty-nine percent of all women reported that they slept under any net the night before the survey and 32 percent of all women reported that they slept under an ITN the night before the survey. The data further show that the same proportion (32 percent) of women slept under an LLIN the night before the survey which seems to emphasize that almost all ITN nets in Southern Sudan are long lasting. Among women in households with an LLIN, 58 percent slept under an LLIN the night before the survey. Net usage is higher among urban women than rural women for LLINs. Women in

households with an LLIN in Upper Nile and Equatoria regions are more likely than women in Bahr el Ghazal to sleep under an LLIN the night before the survey.

Table 4.5: 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 mosquito net (ITN), and a long-lasting insecticide treated mosquito net (LLIN) the night before the survey, by background characteristics, Southern Sudan MIS, 2009

Background characteristic	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	
	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 children	Percentage who slept under an LLIN last night[2]	Number of children
Residence								
Rural	36.6	29.2	28.8	2,882	53.5	1,572	56.0	1,481
Urban	47.3	42.9	42.5	776	62.1	536	63.6	519
Region								
Upper Nile	39.0	27.9	27.5	1,296	58.4	617	60.5	587
Bahr el Ghazal	41.2	34.8	34.1	1,105	49.2	781	52.7	716
Equatoria	36.8	34.2	34.1	1,257	60.6	710	61.4	697
Wealth index								
Poorest	34.7	26.6	26.3	1,145	54.9	553	56.7	529
Second	35.9	30.5	30.3	449	55.9	245	60.4	225
Middle	37.8	27.1	26.9	527	52.6	272	55.0	258
Fourth	38.7	33.3	32.6	727	53.2	455	56.8	417
Richest	47.5	43.1	42.7	810	59.7	583	60.4	571
Total	**38.8**	**32.1**	**31.7**	**3,602**	**55.7**	**2,108**	**58.0**	**2,000**

[2] An insecticide treated mosquito net (ITN) is 1) a factory-treated net that does not require any re-treatment, 2) a pre-treated/conventional net that requires re-treatment on a six monthly basis.

[3] A long lasting insecticide treated mosquito net (LLIN) is a factory-manufactured pre-treated net that does not require any treatment.

Forty-seven percent of pregnant women aged 15-49 reported they slept under any net the previous night (Table 4.6). Thirty-six percent reported that they slept under an ITN. Amongst pregnant women living in households with an LLIN, 67 percent slept under an LLIN the previous night. Urban pregnant women (55 percent) were more likely to sleep under LLIN than their rural counterparts (31 percent). Considering regions, pregnant women from Equatoria were more likely to sleep under a mosquito net than those from Upper Nile.

The results further show that 78 percent of pregnant women from households that have LLIN in Equatoria slept under an LLIN compared to 60 percent in Bahr el Ghazal. The proportion of pregnant women sleeping under an LLIN when a household owns one tends to increase with wealth quintile. However, due to the small number of pregnant women in the survey, differences in net usage by residence and region may not be adequately explained by these figures.

Table 4.6: Use of mosquito nets by Pregnant Women

Percentage of pregnant women who slept under a mosquito net (treated or untreated), an insecticide-treated mosquito net (ITN), and a long-lasting insecticide treated mosquito net (LLIN) the night before the survey, by background characteristics, Southern Sudan MIS, 2009

Background characteristic	Pregnant women in all households				Pregnant women in a household with an ITN		Pregnant women in a household with an LLIN	
	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	44.4	31.6	31.1	421	59.1	225	63.9	191
Urban	60.4	56.0	55.0	91	77.3	66	(78.1)	47
Region								
Upper Nile	46.3	27.5	27.5	149	68.3	60	69.5	59
Bahr el Ghazal	49.8	38.9	37.4	211	54.7	150	59.9	132
Equatoria	44.7	40.1	40.1	152	75.3	81	78.2	78
Wealth index								
Poorest	40.3	26.1	26.1	161	60.8	69	61.8	68
Second	40.0	25.0	25.0	60	(45.5)	33	*	24
Middle	35.6	23.3	22.2	90	(51.2)	41	(51.3)	39
Fourth	58.8	50.0	49.1	114	65.5	87	71.8	78
Richest	62.1	56.2	55.2	87	80.3	61	80.0	60
Total	**47.3**	**35.9**	**35.4**	**512**	**63.2**	**291**	**67.3**	**269**

[2] An insecticide treated mosquito net (ITN) is 1) a factory-treated net that does not require any re-treatment, 2) a pre-treated/conventional net that requires re-treatment on a six monthly basis.

[3] A long lasting insecticide treated mosquito net (LLIN) is a factory-manufactured pre-treated net that does not require any treatment.

Note: Numbers in parentheses are based on 25-49 cases, while an asterisk denotes a figure based on fewer than 25 cases that has been suppressed.

4.1.5 Reasons for not using a mosquito net

Table 4.7 presents information on households that own nets but the nets were not slept under the night before the survey. Overall, 20 percent of households had at least one net that was not slept under the previous night. About 27 percent of households in Bahr el Ghazal reported a net that was not slept under the previous night. Among households with a net that was not slept under the previous night, the most common reason cited for non-usage was that there were no mosquitoes (29 percent of households). Twenty six percent reported that the net was not used because it was the end of the rainy season while 17 percent said because the net was not hung up. Only 7 percent reported that it was too hot to use the net.

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, Southern Sudan MIS, 2009

Background characteristic	Percentage of households with at least one mosquito net that was not slept under the previous night	Number of Households	No mosquitoes	End of rainy season	Not hung up	Too Hot	Person not around	No space	Other	Number of households with at least one that was not slept under the previous night
Residence										
Rural	20.1	2,316	33.0	24.0	19.4	6.4	9.5	3.7	11.8	466
Urban	21.2	481	15.7	30.5	8.3	7.6	3.6	0.0	10.3	102
Region										
Upper Nile	14.8	918	30.9	22.4	14.6	10.0	8.5	2.3	11.0	136
Bahr el Ghazal	26.9	882	32.0	40.4	6.0	3.5	6.0	0.2	9.4	237
Equatoria	19.6	997	22.2	0.0	38.4	9.3	12.1	8.6	16.0	195
Wealth index										
Poorest	18.1	911	44.6	34.2	6.9	10.2	10.9	2.1	9.0	165
Second	17.4	420	40.7	10.6	18.8	3.3	10.7	4.7	5.4	73
Middle	17.9	402	33.6	29.6	12.0	6.4	8.8	0.8	16.8	72
Fourth	24.4	569	12.9	20.7	31.0	2.2	6.6	4.9	13.7	139
Richest	24.0	495	15.3	26.9	16.4	9.3	4.2	1.9	14.0	119
Total	**20.3**	**2,797**	**29.2**	**25.5**	**17.0**	**6.7**	**8.2**	**2.9**	**11.5**	**568**

4.2 INDOOR RESIDUAL SPRAYING

Indoor residual spraying (IRS) is another, extremely effective method of malaria prevention through vector control. The 2009 SSMIS included questions on whether a household had been sprayed with an insecticide within the last 12 months, how long ago it was sprayed, who sprayed the household and whether or not the household paid to have the house sprayed. Table 4.8 presents information on IRS coverage as well as the percentage of households covered by either IRS or at least one ITN.

On average, only 2 percent of all households have been sprayed in the previous 12 months. Households in Bahr el Ghazal Region have the highest IRS coverage (4 percent of households) compared to other regions. Wealthier and urban households are more likely to have been sprayed in the 12 months preceding the survey compared to poorer and rural households.

Fifty four percent of households have either been sprayed in the 12 months preceding the survey or own at least one ITN, i.e., covered by either IRS or an ITN. Following a pattern similar to net ownership and IRS coverage, households in the Bahr el Ghazal (65 percent) are more likely to be covered by either IRS or an ITN compared to, for example, households in Upper Nile (43 percent).

Table 4.8: 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, Southern Sudan MIS 2009

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	1.5	50.9	2,316
Urban	4.8	65.9	481
Region			
Upper Nile	1.0	43.0	918
Bahr el Ghazal	4.2	65.0	882
Equatoria	1.2	53.0	997
Wealth index			
Poorest	0.7	45.8	911
Second	0.7	48.1	420
Middle	3.5	49.0	402
Fourth	2.6	58.6	569
Richest	4.0	69.9	495
Total	**2.1**	**53.5**	**2,797**

4.3 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

In order to reduce the risks of pregnant women getting malaria and untoward effects to the fetus, the current policy under the National Malaria Control Program calls for all pregnant women to receive at least two doses of sulfadoxine-pyrimethamine (SP), at a minimum of one month apart after quickening[4]. Women receive SP during their antenatal care visits under directly observed therapy. It is also possible that pregnant women obtain SP from sources outside of antenatal care visits.

The 2009 SSMIS included questions to women with a live birth in the five years preceding the survey regarding the time they were pregnant with their most recent birth but this section is analyzing only those who had a live birth in the last two years. They were asked if they had taken any antimalaria medicine to prevent getting malaria during the pregnancy, and if so, what type of medicine. 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. Table 4.9 shows the percentage of women who took any antimalaria medicine, and the percentage who took SP/Fansidar.

Forty-four percent of women with a live birth in the two years preceding the survey reported they took some type of antimalaria medicine to prevent getting malaria during the last pregnancy. Asked whether they took SP/Fansidar at least once during the pregnancy, 21 percent reported doing

[4] Quickening is when the pregnant women begin to experience foetal movement.

so and 18 percent said they took two or more doses of SP/Fansidar during the last pregnancy. However, no records were available to show that this information was verified against an ANC card.

These findings show some urban-rural variation in taking antimalaria medicines to prevent malaria during pregnancy; women in urban areas are more likely to take malaria prophylaxis during their last pregnancy than women in rural areas. Also, pregnant women with secondary education and above as well as those in higher wealth quintiles are more likely than women with no or little education, and women in lower wealth quintiles to take malaria prophylaxis during pregnancy.

The survey results suggest that only a small percentage of pregnant women get SP/Fansidar outside of ANC visits. Only 13 percent of women with a live birth in the two years preceding the survey received two or more doses of SP/Fansidar, at least one of which was received as part of an antenatal care visit.

Table 4.9: Prophylactic use of antimalaria 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 antimalaria 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 Southern Sudan MIS, 2009

		SP Fansidar		Intermittent Preventive Treatment		
Background characteristic	Percentage who took any antimalaria 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	38.3	18.9	15.7	15.3	11.1	839
Urban	58.3	27.5	24.8	25.7	20.2	218
Region						
Upper Nile	32.6	16.8	15.3	12.2	9.1	383
Bahr el Ghazal	36.9	17.3	16.9	15.9	12.0	282
Equatoria	55.9	26.7	20.2	23.7	17.4	392
Education						
No schooling	37.9	18.5	15.0	15.6	11.5	787
Primary	54.1	27.4	26.0	22.4	17.0	222
Sec & Above	(67.7)	(29.4)	(26.5)	(32.4)	(20.6)	34
DK/Missing	*	*	*	*	*	14
Wealth index						
Poorest	27.5	14.7	10.9	9.9	7.8	289
Second	33.1	18.2	10.5	16.1	9.1	151
Middle	38.6	19.7	21.8	18.3	14.8	149
Fourth	51.2	20.8	19.8	18.9	15.1	218
Richest	62.7	30.3	24.1	25.6	18.7	250
Total	**43.7**	**20.6**	**17.5**	**17.2**	**12.9**	**1,057**

Note: Numbers in parentheses are based on 25-49 cases, while an asterisk denotes a figure based on fewer than 25 cases that have been suppressed.

ANEMIA AND MALARIA IN CHILDREN AND PREGNANT WOMEN 5

5.1 ANEMIA AMONG CHILDREN AND PREGNANT WOMEN

Anemia is the most widespread micronutrient deficiency in the world, affecting more than 3.5 billion people in developing countries (ACC/SCN, 2000). Anemia is characterized by a reduced number of red blood cells and lower concentrations of hemoglobin in the blood. It is generally the result of a deficiency in iron, which is an essential element in the making of red blood cells. Iron deficiency in children increases the risk of impaired coordination and motor development, learning disabilities, and reduced physical activity. Anemia in women can cause lowered resistance to infection, fatigue, and, particularly for pregnant women, increased risk of maternal and fetal morbidity and mortality, and low-birth-weight.

All children aged 0-59 months and pregnant women living in the households selected for the 2009 SSMIS underwent hemoglobin and malaria testing. In the 2009 SSMIS, the HemoCue system was used to measure the concentration of hemoglobin in the blood and the Paracheck Pf™ rapid diagnostic blood test for detection of *Plasmodium falciparum* in blood was used to detect malaria. Table 5.1 shows the total number of children 0-59 months eligible for testing and the percentages tested for anemia and malaria.

Of the 2,911 children age 0-59 months eligible for testing, 92 percent were tested for anemia using the HemoCue portable machine, 97 percent were tested for malaria using the rapid diagnostic test. The coverage levels were uniformly high across most of the population; however, urban children were more likely to be tested for anemia than were rural children. Testing levels were significantly lower for anemia in Equatoria region compared to other regions.

Table 5.1: Coverage of testing for anemia and malaria in children
Percentage of eligible children age 0-59 months who were tested for anemia and for malaria, by background characteristics, Southern Sudan MIS 2009

Background characteristics	Percentage tested for: Anemia	Malaria RDT	Number of children
Age (in years)			
<1	90.3	97.1	248
1	92.6	95.4	556
2	91.5	97.5	692
3	94.7	96.4	717
4	90.5	97.2	715
Residence			
Rural	91.0	97.0	526
Urban	97.2	96.4	2,385
Region			
Upper Nile	98.0	98.3	1,099
Bahr el Ghazal	91.7	96.2	759
Equatoria	86.4	96.0	1,053
Wealth index			
Poorest	94.6	97.1	900
Second	89.6	98.2	392
Middle	91.8	96.6	421
Fourth	92.4	96.6	647
Richest	90.1	96.0	551
Total	92.1	96.9	2,911

5.1.1 Anemia Prevalence among Children

Table 5.2 shows the percentage of children age 0-59 months classified as having anemia (hemoglobin concentration of less than 11.0 grams per decilitre), by background characteristics.

The results of the 2009 SSMIS show that 64 percent of children in Southern Sudan under the age of 5 years are anemic; twenty-three percent are mildly anemic (Hb concentration levels of 10-10.9 g/dl), 30 percent are moderately anemic (Hb concentration levels of 8.0-9.9 g/dl), and 11 percent are severely anemic (Hb concentration levels of less than 8 g/dl). Based on these findings anemia seems to be a significant public health problem in Southern Sudan. Anemia is highest among children 12-23 months old; the proportion of children with anemia then decreases with age.

There is no difference in the levels of anemia between rural and urban children (64 percent). Children from areas where LLIN campaigns had taken place prior to the survey were less anemic than their counterparts from where no campaigns had been conducted (9 percent vs 13 percent for severe anemia). Considering regions, children in the Upper Nile region (67 percent) are generally more anemic than those in other regions. The data does not suggest any particular trend in anemia prevalence as far as wealth quintiles are concerned.

Table 5.2: Prevalence of anemia in children

Percentage of children aged 5 years and below classified as having anemia, by background characteristics, Southern Sudan MIS, 2009

Background characteristic	Anemia Status by hemoglobin level: Mild (10.0-10.9 g/dl)	Moderate (8.0-9.9 g/dl)	Severe (Below 8.0 g/dl)	Any Anemia	Number of children
Age (in years)					
<1	27.8	33.6	13.5	74.9	223
1	20.0	41.3	17.1	79.4	514
2	22.8	31.7	16.6	73.1	628
3	24.3	27.4	7.8	62.5	678
4	23.8	19.6	4.2	51.6	643
Residence					
Rural	23.6	29.6	11.0	64.2	2,174
Urban	22.1	29.8	12.3	64.2	512
LLIN Campaign					
Yes	21.8	29.0	8.9	59.7	1,181
No	24.5	30.3	13.1	67.9	1,505
Region					
Upper Nile	21.8	32.0	12.9	66.7	1,077
Bahr el Ghazal	20.6	28.5	10.2	59.3	699
Equatoria	27.1	27.9	10.1	65.1	910
Wealth index					
Poorest	23.1	28.2	10.6	61.9	847
Second	24.3	30.6	12.5	67.4	351
Middle	20.9	29.9	14.7	65.5	388
Fourth	25.5	31.5	8.1	65.1	603
Richest	22.1	29.4	12.3	63.8	497
Total	**23.3**	**29.7**	**11.2**	**64.2**	**2,686**

5.1.2 Anemia Prevalence among Pregnant Women

Table 5.3 shows the percentage of pregnant women classified as having anemia (hemoglobin concentration of less than 11.0 grams per decilitre), by background characteristics.

The results of the 2009 SSMIS show that 46 percent of pregnant women at the time of the survey were anemic; twenty-three percent were mildly anemic (Hb concentration levels of 10-10.9 g/dl), 19 percent are moderately anemic (Hb concentration levels of 8.0-9.9 g/dl), and only four percent were severely anemic (Hb concentration levels of less than 8 g/dl). Anemia is highest in pregnant women residing in urban areas (49 percent) compared to those in rural areas (45 percent)

Pregnant women in Bahr el Ghazal were more likely to be anemic (49 percent) than their counterparts in the Upper Nile and Equatoria regions. Anemia is more severe among women in the poorest quintile (5 percent) but just like children under five years, no particular trend in anemia levels is depicted by the data.

Table 5.3: Prevalence of anemia in pregnant women

Percentage of pregnant women classified as having anemia, by background characteristics, Southern Sudan MIS, 2009

Background characteristic	Anemia Status by hemoglobin level: Mild (10.0-10.9 g/dl)	Moderate (8.0-9.9 g/dl)	Severe (Below 8.0 g/dl)	Any Anemia	Number of Women
Residence					
Rural	22.1	19.4	3.6	45.1	72
Urban	27.8	15.3	5.6	48.7	330
Region					
Upper Nile	20.3	19.5	4.2	44.0	120
Bahr el Ghazal	25.8	18.6	4.8	49.2	166
Equatoria	22.2	18.0	2.6	42.8	116
Wealth index					
Poorest	28.6	15.8	5.3	49.7	135
Second	19.2	25.0	1.9	46.1	55
Middle	22.0	22.0	3.4	47.4	62
Fourth	20.7	15.9	4.9	41.5	82
Richest	22.7	16.7	3.0	42.4	68
Total	**23.1**	**18.7**	**4.0**	**45.8**	**402**

5.2 MALARIA AMONG CHILDREN AND PREGNANT WOMEN

5.2.1 Malaria Prevalence among Children

Prevalence of malaria parasites among children aged 0-59 months was measured in the 2009 SSMIS in two ways. In the field, health technicians used the rapid diagnostic test (RDT) to determine whether children had malaria using blood from finger or heel prick samples. Children with positive RDT results were offered antimalaria treatment according to national malaria treatment protocol. In addition, thin and thick smears from each child's blood were prepared in the field, dried in dust-free environment, stored in slide boxes and transported to Juba. The smears were stained for microscopy testing at a reference laboratory at Juba Teaching Hospital. All microscopy positive samples and 10 percent of negative samples were taken to a WHO pre-qualified laboratory in the Republic of Oman for confirmatory testing. Table 5.4 shows the results of both malaria tests (RDT and microscopy) for children 0-59 months by background characteristics.

Using RDT, 25 percent of children 0-59 months tested positive for malaria while 14 percent were positive using microscopy testing[5]. In both tests, malaria prevalence increases with the age of the child; for example using RDT the prevalence in children under 12 months was 20 percent while that for children in the age range 36-59 months was 27 percent. Prevalence is higher in rural areas than in urban areas (26 vs. 18 percent using RDT test) and is highest in the Equatoria region (48 percent using RDT and 29 percent using microscopy testing) and lowest in Upper Nile (8 percent using RDT and 3 percent using microscopy).

In areas where an LLIN campaign had taken place before the survey, prevalence of malaria was lower using both RDT and Microscopy compared to areas where there had been no campaign (20 vs 28 percent for RDT and 10 vs 17 percent for microscopy). It is important to note that a number of slides could not be read in the laboratory and as such they have not been included in the analysis.

[5] This may be due to the fact that HRP2 detecting RTDs continue to detect malaria parasite antigens for several weeks even after successful treatment

Table 5.4: Prevalence of malaria in children

Percentage of children age 0-59 months classified as having malaria, by background characteristics, Southern Sudan MIS 2009

Background characteristic	RDT Positive	Number of children	Microscopy	Number of children
Age (in years)				
<1	19.6	245	9.6	187
1	20.6	554	12.6	422
2	24.0	684	13.3	536
3	27.1	707	15.8	557
4	27.1	709	16.3	559
Residence				
Rural	25.9	525	15.2	1826
Urban	18.3	2,374	10.2	433
LLIN Campaign				
Yes	20.3	1,277	9.8	814
No	27.8	1,622	16.7	1447
Region				
Upper Nile	7.8	1,079	2.9	829
Bahr el Ghazal	16.1	765	4.8	500
Equatoria	47.7	1,055	29.3	932
Wealth index				
Poorest	16.3	886	8.8	692
Second	21.1	393	11.9	277
Middle	19.8	420	11.0	310
Fourth	36.3	648	22.7	533
Richest	29.8	552	16.1	449
Total	**24.5**	**2,899**	**14.2**	**2261**

5.2.2 Malaria Prevalence among Pregnant Women

Table 5.5 shows the results of malaria tests (both RDT and Microscopy) for pregnant women by background characteristics. Ten percent of the pregnant women interviewed tested positive for malaria using RDT while 9 percent tested positive using microscopy tests. Malaria prevalence is higher in rural areas than in urban areas in both tests (11 vs. 7 percent for RDT) and is highest in the Equatoria region (15 percent for RDT and 14 percent microscopy). The results further show that malaria prevalence was higher in areas where an LLIN campaign had not taken place as compared to areas where campaigns had taken place (13 percent and 7 percent for RDT). There is no special trend depicted as far as the prevalence and the wealth of households of pregnant women is concerned.

Table 5.5: Prevalence of malaria in Pregnant women

Percentage of pregnant women classified as having malaria, by background characteristics, Southern Sudan MIS 2009

Background characteristic	RDT Positive	Number of Women	Microscopy	Number of Women
Residence				
Rural	10.6	358	8.7	276
Urban	6.6	76	7.3	55
LLIN Campaign				
Yes	7.2	237	6.9	159
No	13.2	197	9.9	172
Region				
Upper Nile	8.9	123	1.1	91
Bahr el Ghazal	6.4	173	8.2	122
Equatoria	15.2	138	14.4	118
Wealth index				
Poorest	8.7	150	3.5	115
Second	7.1	56	13.5	39
Middle	15.6	64	9.3	45
Fourth	8.7	91	8.2	76
Richest	10.8	73	14.8	56
Total	**9.9**	**434**	**8.5**	**331**

5.2.3 Malaria Parasite Species

Another objective of the survey was to determine the type of *Plasmodium* parasite found in children and pregnant women with positive thick smears. Table 5.6 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-four percent of infected children and pregnant women had *Plasmodium falciparum*, five percent had *P. vivax* while less than one percent had *P. malariae*. No *P. ovale* species were seen. Six percent carried mixed species infection. Mixed species were seen most in Equatoria region (7.9%) as compared to other regions. No P.vivax and P.malariae species were found in Bahr el Ghazal and Upper Nile.

Table 5.6: 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, Southern Sudan MIS 2009

Background characteristic	P. *falciparum*	P.*vivax*	P. *malariae*	*Mixed species*	Number of Women/children with malaria parasite
Residence					
Rural	94.5	4.8	0.8	6.5	399
Urban	93.7	6.3	0.0	4.7	64
Region					
Upper Nile	100.0	0.0	0.0	0.0	65
Bahr el Ghazal	100.0	0.0	0.0	3.5	58
Equatoria	92.4	6.8	0.9	7.9	340
Total	**94.4**	**5.0**	**0.7**	**6.3**	**463**

CHALLENGES OF DATA QUALITY AND RECOMMENDATIONS

The SSMIS had a few challenges which are worth mentioning in this report. In general South Sudan still has little capacity to conduct national surveys and as such there were a number of management and organizational challenges in the implementation of the survey.

Eligible Women: As earlier mentioned in this report, household and women questionnaires were used to collect information in this survey. The household questionnaires listed all household members and provided information about eligible women for interview. It is worth mentioning that of all the women identified in the household questionnaires as eligible, about 80 percent were interviewed but no information is recorded on about 20 percent of them. No questionnaires were prepared for them to show that they could not be traced throughout the duration of fieldwork. In future surveys, every eligible woman should have a questionnaire and the final result recorded.

Age mis-reporting: From the population pyramid presented, there are many females in the age range 10-14 and 50-54 years. This was most likely due to a deliberate attempt by interviewers to avoid doing many more interviews and such tended to make women younger than 15 and older than 49. This can be solved in future surveys by intensifying on supervision. Supervisors would have to visit the households before the interviews to ascertain these borderline ages. In this regard, interviewers also get to know that their work is being checked and record the right ages.

Blood Slides: The survey involved getting blood samples and preparing slides. Serial numbers were generated for matching questionnaire information with slides. The slides were initially labeled with numbers. This necessitated interviewers writing numbers on the questionnaires from the slides thereby creating room for human error. In some instances, slides without numbers were distributed and such interviewers/laboratory staff provided strange numbers on the slides which were difficult to match with questionnaire information. It is recommended that in future surveys, barcodes be used since they are less prone to human error.

Household Listing Forms: The household listing was done before sample selection and interviewing. These lists are very important for use in computing probabilities and hence weights for the different EA's. It was found out that for slightly over 20 percent of the EA's, these lists were misplaced and as such weights were not computed. The sample however was almost proportionally allocated hence self weighting in the three strata and hence this has little or no effect on the results. It is recommended that in future surveys the summary from these lists be entered in a computer and the lists be kept safely.

Period between data collection and data entry: Fieldwork was conducted in November/December 2009 while data entry started in August 2010. This period between these two processes is rather long and as such may have an effect on the quality of the data. In future surveys, it should be planned that these operations are carried out concurrently since at times it helps to identify some errors of omission when teams are still in the field and they have them fixed.

All the above issues notwithstanding the report provides a true picture of the malaria situation in Southern Sudan and will serve as a baseline for future surveys. Periodic standalone malaria indicator surveys will go a long way in informing program managers and policy makers about the progress made within specific periods. Investment should be made in strengthening the human resource capacity within the National Malaria Control Program and the other departments of the Ministry of Health in conducting and managing surveys.

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4	Chan Pai Wek	Supervisor
5	Simon Ajuong Alirr	Laboratory Technician
6	Mario Mathiang Gur	Laboratory Technician
7	Clement Manoon Kon	Laboratory Technician

8	James Ayei Maror	Laboratory Technician
9	Philip Kero Mou	Laboratory Technician
10	Emmanuel Madit	Laboratory Technician
11	Akot Santino Anei	Laboratory Technician
12	Wol Peter Santino	Laboratory Technician
13	Michael Mayik Deng	Laboratory Technician
14	Peter Malek Parek	Interviewer
15	Thomas Thiik Yak Thiik	Interviewer
16	Mareng Santino Ariath	Interviewer
17	Kondok Madut Alol	Interviewer
18	Angelo Anei Anei	Interviewer
19	Johnson Jal-Wau Thuou	Interviewer
20	Achuil Majok Kuol	Interviewer
21	James Makuei Marieu	Interviewer
22	Benjamin Malueth Maker	Interviewer

6. NORTHERN BAHR EL GHAZAL STATE

S/No	NAME	POSITION
1	Ather Martin Arther	Field Operations Manager
2	Simon Dut Mau	Supervisor
3	Samuel Garang Deng	Supervisor
4	Daniel Kuach Atuer	Laboratory Technician
5	Hasam Jalal	Laboratory Technician
6	Lino Lual Dau	Laboratory Technician
7	Luka Lual Chol	Laboratory Technician
8	Jacob Nyal Malong	Laboratory Technician
9	Deng Chan Chan	Laboratory Technician
10	Simon Alwong Lual	Interviewer
11	Konyang Santino Mabuoc	Interviewer
12	Achak William Piol	Interviewer
13	Samuel Kuol Mayen	Interviewer

14	Samuel Akol Akok	Interviewer
15	Abraham Amuk Malek	Interviewer

7. WESTERN BAHR EL GHAZAL STATE

S/No	NAME	POSITION
1	Yak Ayiel Longar	Field Operations Manager
2	Drinelson Candido	Supervisor
3	Roza Benjamin Bubu	Laboratory Technician
4	Johnson John	Laboratory Technician
5	Paul Ayii Lawrence	Laboratory Technician
6	Emmanuel James Edward	Interviewer
7	Joice Ferdinand Hissan	Interviewer
8	Juma Bai Wando	Interviewer

8. JONGLEI STATE

S/No	NAME	POSITION
1	Madio Komolia	Field Operations Manager
2	Gatwech Koryom Luom	Supervisor
3	Puoch Deng Luak	Supervisor
4	Majak Manyok Bul	Supervisor
5	Deu John Bol	Laboratory Technician
6	Deng Nyok Deng	Laboratory Technician
7	John Makuei Alier	Laboratory Technician
8	Tut Lual Chuiny	Laboratory Technician
9	Jacob Gadiet Manyal	Laboratory Technician
10	Peter Tut Gatluak	Laboratory Technician
11	Wech David Chol	Laboratory Technician
12	Andrew Adeer Bol	Laboratory Technician
13	Adau Achuany Chol	Laboratory Technician
14	Ayuen Tit Alith	Interviewer
15	Thuc Samuel Thon	Interviewer
16	Thon Atem Ayiei	Interviewer
17	James BieL Dong	Interviewer
18	Khor Jock Nyoot	Interviewer
19	Stephen Ter Duol	Interviewer

20	Gatbel Gai Kier	Interviewer
21	John Biel Maluath	Interviewer
22	Mangar Alier Maler	Interviewer

8. JONGLEI STATE-POCHALLA

S/No	NAME	POSITION
1	Jackson Logithoy	Supervisor
2	Cham Nyium Albert	Laboratory Technician
3	Morcen Ojwok	Laboratory Technician
4	Gilo Otholi Oboya	Laboratory Technician
5	Yunis Isaac	Interviewer
6	Ogani Oman Odol	Interviewer
7	Noah Omot Omot	Interviewer

8. JONGLEI STATE-PIBOR

S/No	NAME	POSITION
1	Luke Loyen L.	Supervisor
2	John Kaka Gain	Laboratory Technician
3	James Meryangole	Laboratory Technician
4	Docklarce Yelmaris	Laboratory Technician
5	Benjamin Kamyen	Interviewer
6	Alan Johnson	Interviewer
7	David Jowang Kuju	Interviewer

9. UPPER NILE STATE

S/No	NAME	POSITION
1	John Opiti Nyibir	Field Operations Manager
2	Odhok Yuhanis Johnson	Supervisor
3	Adong Okic Bol	Supervisor
4	Venancio Arop Okic	Supervisor
5	Rosa Adhiuo Judho	Laboratory Technician
6	Yacub Jamal Yacob	Laboratory Technician
7	Abdalla Nasir Abdalgadir	Laboratory Technician

8	Nyunjok Chuol Dijiok	Laboratory Technician
9	Cham Timothy Thowl	Laboratory Technician
10	Kak Deng Kak	Laboratory Technician
11	John Nyiker Ngor	Laboratory Technician
12	Hakim Isaac Nyaluk	Laboratory Technician
13	Maki Kual Pal	Laboratory Technician
14	Khan Wuok Koang	Interviewer
15	Mohammed Dawod Momin	Interviewer
16	Wuok Yien Deng	Interviewer
17	Gai Chol Chai	Interviewer
18	Wuol Kueth Bidong	Interviewer
19	Chuol Gatkuoth Wur	Interviewer
20	Philip Mabil Lual	Interviewer
21	Kulang Gach Khor	Interviewer
22	Changkuoth Ding Dungtit	Interviewer

10. UNITY STATE

S/No	NAME	POSITION
1	Chuol Tong Dwoth	Field Operations Manager
2	Daniel Dalenga	Supervisor
3	Dhill Nguen Bath	Supervisor
4	James Duok Gai	Laboratory Technician
5	Kerabino Giel Kong	Laboratory Technician
6	Samuel koah Riek	Laboratory Technician
7	William Puol Wuor	Laboratory Technician
8	Simon Lei Riak	Laboratory Technician
9	John Manyang Gai	Laboratory Technician
10	Rebecca Nyagai Bol	Interviewer
11	Sarah Nyanjang Kulang	Interviewer
12	Gatjang Koak Dhol	Interviewer
13	Michael Manyang Jombiel	Interviewer
14	George Lul Muth	Interviewer
15	Jacob Mayik Monybech	Interviewer

DATA PROCESSING STAFF

S/No	Name	Position
1	Tesloach Gach	Supervisor
2	Jacob Thon Akuien	Administrator
3	Bakhit Sebit	Administrator
4	Clementina Dema	Support Staff
5	Raile Hakim Comdan	Support Staff

DATA ENTRY CLERKS

S/No	Name	Position
1	Akello Hellen Felistas	Data Entry Clerk
2	Amin Moses Mogga	Data Entry Clerk
3	Aromeo James Sworo	Data Entry Clerk
4	Francisco Iskander Lado	Data Entry Clerk
5	Issa Mohammed Omar	Data Entry Clerk
6	Jimmy Winsz Okullo	Data Entry Clerk
7	John Bol Manyok	Data Entry Clerk
8	Ladu Simon Raymond	Data Entry Clerk
9	Lomurye Emmanuel Geri	Data Entry Clerk
10	Marle Tonny Francis	Data Entry Clerk
11	Ngong Samuel Kuach	Data Entry Clerk
12	Poya Rose Eluzai	Data Entry Clerk
13	Sijali Haruna Erkadious	Data Entry Clerk
14	Wai Wai Rosette	Data Entry Clerk
15	Woja Robert Duku	Data Entry Clerk

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

Southern Sudan

Household Questionnaire

November 2009

IDENTIFICATION

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

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

INTERVIEWER VISITS ***(Complete at end of interview)***

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

*RESULT CODES:

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

TOTAL PERSONS IN HOUSEHOLD ☐☐

TOTAL ELIGIBLE WOMEN ☐☐

LINE NUMBER OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE ☐☐

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____ DATE _____ ☐☐	☐☐	☐☐

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working with MOH/GOSS. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the government to plan health services. The survey will take around 30 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	RELATIONSHIP TO HEAD OF HOUSEHOLD	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 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. IF LESS THAN ONE MONTH, ENTER 00 MONTHS.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49
(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	RELATIONSHIP TO HEAD OF HOUSEHOLD	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 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 15-49
(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	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
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 HOUSEHOLD 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	YES.....1 NO.....2 DON'T KNOW.....8	<17

	INSECTICIDE THAT THE RESPONDENT HAS PURCHASED THEMSELVES. SHOW THE RESPONDENT PICTURES TO CLARIFY)		
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 HOUSEHOLD 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, MOVE TO NEXT PAGE; IF MORE THAN SIX USE ADDITIONAL QUESTIONNAIRES	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 DISTRIBUTION…..…… 3 COMMUNITY OUTREACH e.g. EPI……..4 PRIVATE SECTOR SHOP……5 MARKET/VENDOR ……...6 PHARMACY……...7 OTHER_____8 (SPECIFY) DON'T KNOW……9	GOV HEALTH FACILITY……....1 NGO……....2 COMMUNITY BASED DISTRIBUTION…..…… 3 COMMUNITY OUTREACH e.g. EPI……..4 PRIVATE SECTOR SHOP……5 MARKET/VENDOR ……...6 PHARMACY……...7 OTHER_____8 (SPECIFY) DON'T KNOW……9	GOV HEALTH FACILITY……....1 NGO……....2 COMMUNITY BASED DISTRIBUTION…..…… 3 COMMUNITY OUTREACH e.g. EPI……..4 PRIVATE SECTOR SHOP……5 MARKET/VENDOR ……...6 PHARMACY……...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?	☐☐ SDG……..……1` OTHER CURRENCY_____ 2 (SPECIFY)	☐☐ SDG……..……1 OTHER CURRENCY_____ 2 (SPECIFY)	☐☐ SDG……..……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 2 YEARS AGO....95 NOT SURE....98	MONTHS AGO [ ][ ] MORE THAN 2 YEARS AGO....95 NOT SURE....98	MONTHS AGO [ ][ ] MORE THAN 2 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 Q. 30.	NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ]	NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ]	NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ] NAME ______ LINE NO: [ ][ ]

		NET # 1	NET #2	NET #3
		(SKIP TO 30)	(SKIP TO 30)	(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 # 4	NET #5	NET #6
19	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, MOVE TO NEXT PAGE; IF MORE THAN SIX USE ADDITIONAL QUESTIONNAIRES	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 DISTRIBUTION…..………………. 3 COMMUNITY OUTREACH e.g. EPI…………………………..4 PRIVATE SECTOR SHOP………………………………5 MARKET/VENDOR ……………...6 PHARMACY………………………..7 OTHER_____________________8 (SPECIFY) DON'T KNOW………………………9	GOV HEALTH FACILITY…………....1 NGO……………………………........2 COMMUNITY BASED DISTRIBUTION…..………………. 3 COMMUNITY OUTREACH e.g. EPI…………………………..4 PRIVATE SECTOR SHOP………………………………5 MARKET/VENDOR ……………...6 PHARMACY…………………………..7 OTHER_____________________8 (SPECIFY) DON'T KNOW………………………9	GOV HEALTH FACILITY…………....1 NGO……………………………........2 COMMUNITY BASED DISTRIBUTION…..………………. 3 COMMUNITY OUTREACH e.g. EPI…………………………..4 PRIVATE SECTOR SHOP………………………………5 MARKET/VENDOR ……………6 PHARMACY…………………………..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?	[ ][ ] SDG…………………...……………1 OTHER CURRENCY___________ 2 (SPECIFY)	[ ][ ] SDG…………………...……………1 OTHER CURRENCY___________ 2 (SPECIFY)	[ ][ ] SDG…………………...……………1 OTHER CURRENCY___________ 2 (SPECIFY)

		NET # 4	NET #5	NET #6
24	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	'LONG-LASTING (LLIN)' PERMANET....1 OLYSET....2 INTERCEPTOR....3 NET PROTECT....4 DURANET....5 ICONLIFE....6 'PRETREATED NET' SERENA....7 '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 '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 '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 2 YEARS AGO....95 NOT SURE....98	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO....95 NOT SURE....98	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO....95 NOT SURE....98
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.	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 # 4	NET #5	NET #6
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)

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 anemia and blood parasite levels among children under five and pregnant women. Anemia 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 2005 or later) participate in the anemia 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 anemia. 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 ANEMIA / MALARIA

	RESULTS OF BLOOD TEST (ANEMIA / MALARIA)		TREATMENT PROVIDED	BLOOD SLIDE	
LINE NUMBER FROM COL. (1) COPY FROM PREVIOUS PAGE	HEMOGLOBIN LEVEL (ANEMIA RESULT) (G/DL)	RDT RESULT (MALARIA RESULT) POSITIVE=1 NEGATIVE=2 INVALID=3	TREATMENT (ANEMIA / 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)
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:
	.		AS+AQ……………………….1 IRON…………………………..2 ALBENDAZOLE……………....3 PARACETAMOL………………4 REFERRED…………………..…5 REFUSED…………………….…6		A: B:

44	CHECK 39: NUMBER OF CHILDREN WITH HEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE ☐ ↓ GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 45. NONE ☐ ↓ GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HEMOGLOBIN MEASUREMENT AND END THE HOUSEHOLD INTERVIEW.
45	We detected a low level of hemoglobin in the blood of [NAME OF CHILD(REN)]. This indicates that (NAME OF CHILD(REN) has/have developed severe anemia, 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 HEMOGLOBIN BELOW 7 G/DL	NAME OF PARENT/RESPONSIBLE ADULT	AGREES TO REFERRAL?
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2

INTERVIEWER'S OBSERVATIONS

(TO BE FILLED IN AFTER COMPLETING INTERVIEW)

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____ DATE: _____

Serial Number															

Malaria Indicator Survey
Southern Sudan

Women's Questionnaire

November 2009

IDENTIFICATION *(Complete at start of interview – same as HH questionnaire)*	
REGION…….	☐
STATE……	☐☐
COUNTY ……	☐☐
PAYAM……	☐☐
BOMA……	☐☐☐
ENUMERATION AREA (EA)……..	☐☐☐
HOUSEHOLD NUMBER……..	☐☐☐
HOUSEHOLD COORDINATES (FROM GPS)……	N __ __ . __ __ __ __ __ ° E __ __ __ . __ __ __ __ __ °
NAME OF WOMAN AND LINE NUMBER: ……	☐☐

INTERVIEWER VISITS *(Complete at end of interview)*				
	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY ☐☐ MONTH ☐☐ YEAR ☐☐☐☐
INTERVIEWER'S CODE	_____	_____	_____	
INTERVIEWER'S NAME	_____	_____	_____	TIME ____ ____ : ____ ____
RESULT*	_____	_____	_____	RESULT ☐
NEXT VISIT: DATE	_____	_____		TOTAL NO. OF VISITS ☐
TIME	_____	_____		

*RESULT CODES:

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

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/GOSS. We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the government to plan health services. 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	
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 any of the children to whom you have given birth alive, but do not live with you?	YES .....1 NO 2	→206
205	How many sons or daughters do you have whom are alive, but do not live with you IF NONE, RECORD '00'.	SONS ELSEWHERE ..... ☐☐ DAUGHTERS ELSEWHERE .. ☐☐	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: ANY BABY WHO CRIED 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 → ☐ PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE BIRTH (tick box) ☐ → Was this child born in the last five years (since January 2005)? TWO OR MORE BIRTHS (tick box) ☐ → How many of these children were born in the last five years (since January 2005)? 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 2005), **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 CHRONOLOGICALLY FROM MOST RECENT 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 HOUSEHOLD 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)? 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 RECONCILE) 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 2005 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 2005 OR LATER NO BIRTHS IN 2005 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 RECORD 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 2005 OR LATER ☐	NO LIVING CHILDREN BORN IN 2005 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 2005 OR LATER). IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN IN 2005 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 _____

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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? RECORD ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....1 GOVT. HEALTH CENTER.....2 GOVT. HEALTH UNIT.....3 MOBILE CLINIC.....4 COMMUNITY HEALTH WORKER.....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 HEALTH WORKER.....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 a 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) =——┤

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
321	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED. ASK TO SEE DRUG(S) OR PACKET (IF STAILL AVAILABLE) IF TYPE OF DRUG IS NOT KNOWN. ***NB. ACTs (ARTEMISININ-BASED COMBINATION THERAPY):*** *AS+AQ = ARTESUNATE + AMODIAQUINE* *ATM+LUM = ARTEMETHER + LUMEFRANTRINE (COARTEM)* *AS+SP = ARTESUNATE + SULPHADOXINE PYRIMETHAMINE*	ACTs: AS+AQ .....1 ATM-LUM (COARTEM).....2 AS+SP .....3 Non-ACTs: QUININE.....4 ARTEMETHER.....5 SP/FANSIDAR.....6 CHLOROQUINE .....7 AMODIAQUINE .....8 OTHER ANTIMALARIA_____ 9 (SPECIFY) OTHER DRUGS ASPIRIN.....10 ACETAMINOPHEN/ PARACETAMOL.....11 IBUPROFEN.....12 OTHER 'OTHER' DRUGS _____ 13 (SPECIFY) DON'T KNOW.....14	ACTs: AS+AQ .....1 ATM-LUM (COARTEM).....2 AS+SP .....3 Non-ACTs: QUININE.....4 ARTEMETHER.....5 SP/FANSIDAR.....6 CHLOROQUINE.....7 AMODIAQUINE .....8 OTHER ANTIMALARIA_____ 9 (SPECIFY) OTHER DRUGS 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 NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO Q. 401)	YES ☐ NO ☐ (IF NO GO TO 312 IN NEW QUESTIONNAIRE OR IF NO MORE BIRTHS, SKIP TO Q. 401)
323	CHECK 321: AS+AQ ('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 AS+AQ 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+AQ 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

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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)

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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)

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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 ☐ → (SKIP TO 351) CODE '7' NOT CIRCLED ☐	CODE '7' CIRCLED ☐ → (SKIP TO 351) CODE '7' NOT CIRCLED ☐
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 ☐ → (SKIP TO 355) CODE '8' NOT CIRCLED ☐	CODE '8' CIRCLED ☐ → (SKIP TO 355) CODE '8' NOT CIRCLED ☐

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
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)

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	HEMOGLOBIN LEVEL (ANEMIA 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 anemia and blood parasite levels among children under five and pregnant women. Anemia is a serious health problem that results from poor nutrition or diseases such as malaria. Both anemia 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 anemia 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 anemia. 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:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____ DATE: _____