NIGERIA

Malaria Indicator Survey (MIS)

2010

Nigeria
Malaria Indicator Survey
2010

Final Report

National Population Commission
Federal Republic of Nigeria
Abuja, Nigeria

National Malaria Control Programme
Federal Republic of Nigeria
Abuja, Nigeria

MEASURE DHS
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Government of Nigeria

The World Bank

The 2010 Nigeria Malaria Indicator Survey (2010 NMIS) was implemented by the National Population Commission (NPC) and the National Malaria Control Programme (NMCP) from October 2010 through December 2010. ICF International provided technical assistance through the MEASURE DHS programme, a project funded by the United States Agency for International Development (USAID), which provides support and technical assistance in the implementation of population and health surveys in countries worldwide.

Funding for the 2010 NMIS was provided by the NMCP, Global Fund [through the Society for Family Health (SFH) and Yakubu Gowon Centre (YGC)], World Bank, United Kingdom Department for International Development (DFID) [through the Support to Nigeria Malaria Programme (SuNMaP)], and USAID [through the MEASURE DHS programme at ICF International].

Additional information about the 2010 NMIS may be obtained from the headquarters of the National Population Commission, Plot 2031, Olusegun Obasanjo Way, Zone 7 Wuse, PMB 0281, Abuja, Nigeria; Telephone: (234) 09 523-9173; Fax: (234) 09 523-1024.

Information about the DHS programme may be obtained from the MEASURE DHS Project, ICF International, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, United States; Telephone: 301-572-0200; Fax: 301-572-0999; E-mail: info@measuredhs.com; Internet: http://www.measuredhs.com.

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FOREWORD

Recent malaria control efforts have received a huge boost of support with an influx of resources in the drive to massively scale up all interventions for evident impact. To justify these resources, it was imperative that we have evidence-based data to determine the effect that malaria control interventions have had on the huge burden of the disease in Nigeria. In addition, there is a need to determine where the country stands as a baseline for the full implementation of the 2009-2013 National Strategic Plan for Malaria Control in Nigeria. The targets are: (1) 100 percent household ownership and 80 percent use of long-lasting insecticidal nets (LLINs) by children under the age of 5 and by pregnant women; (2) 80 percent of persons with malaria accessing prompt and effective treatment; and (3) 100 percent of pregnant women attending antenatal care (ANC) clinics to receive at least two doses of intermittent preventive treatment (IPT).

The 2008 NDHS data shows that household ownership of ITNs was 8 percent, and ITN use by children under age 5 was 6 percent, while use by pregnant women was 5 percent. The proportion of children with fever who received appropriate treatment with artemisinin-based combination therapy (ACT) was found to be 2 percent, and the proportion of pregnant women who received IPT, that is, two or more doses of sulphadoxine-pyrimethamine (SP) with at least one dose provided during an ANC visit, was 5 percent. However, between 2008 and 2010, more than 24 million LLINs have been distributed through mass campaigns in 14 states, and more than 45 million doses of ACTs have been deployed. This underscores the importance of this survey, which provides more up-to-date information on the progress of malaria interventions in Nigeria and the impact of these interventions.

A previous effort was made to carry out a similar survey in 2005 to evaluate the implementation of 2001-2005 Country Strategic Plan. However, that survey did not capture laboratory/malariometric measurements critical to establishing malaria prevalence rates at the national and zonal levels that serve as an impact indicator directly tied to malaria control interventions. Many of the frequently quoted prevalence rates for malaria were derived from localised household or health facility-based surveys which are not nationally representative. The 2010 NMIS fills a this gap by providing the baseline malaria prevalence rates that can be compared to future national and zonal prevalence estimates to evaluate progress towards reducing malaria prevalence in Nigeria.

The standardized MIS tools and outputs also provide a strategic opportunity to compare the malaria burden and control effort across regional and national boundaries, and demonstrate variations and changes in patterns across recognized transmission zones, making it a valuable tool in monitoring changing transmission patterns.

The Federal Ministry of Health, in collaboration with its Roll Back Malaria partners, commissioned the National Population Commission to conduct the survey, alongside the National Malaria Control Programme, with technical assistance from ICF International. I would like to use this opportunity to thank all our partners who have committed funds to this venture including the World Bank, USAID, Global Fund to Fight AIDS, TB, and Malaria (GFATM), and United Kingdom Department for International Development (DFID). Other partners such as WHO, Society for Family Health, The Carter Center, and Yakubu Gowon Centre, who have put other forms of resources into the planning and implementation of the 2010 NMIS are also appreciated. My special appreciation also goes to the National Population Commission for bringing their experience and expertise to bear on the implementation of this survey.

There is no doubt that the results of the 2010 Malaria Indicator Survey will go a long way in providing the needed evidence for future planning, review of the national strategic plan, and re-programming where necessary.

Professor C.O. Onyebuchi Chukwu
Honourable Minister of Health

PREFACE

The availability and documentation of detailed information required for articulating and evaluating policy implementation is critical to the achievement of meaningful national development. The provision of reliable, accurate, and current data for Nigeria has been at the centre stage of the activities of the National Population Commission (NPC), which is constitutionally charged with the responsibility to gather and analyze demographic data.

Commissioned by the National Malaria Control Programme (NMCP), the 2010 Nigeria Malaria Indicator Survey (NMIS) was implemented by the NPC, NMCP and other Roll Back Malaria partners. Primary objectives of the survey were to provide information on malaria indicators and malaria prevalence at national and zonal levels. The survey, the first of its kind to be conducted in all 36 states and the Federal Capital Territory (FCT) of Nigeria, covers topics such as background characteristics (age, residence, education, media exposure, and literacy), birth history, childhood mortality, antenatal care and malaria prevention during pregnancy for most recent births, malaria prevention and treatment, and knowledge about malaria (symptoms, causes, prevention, and drugs used in treatment). Information was collected from all women age 15-49 in selected clusters.

I wish to thank the NPC Chairman and Federal Commissioners for the support they offered during the implementation period by providing the required leadership and advocacy. The support provided by Dr. W. D. C. Wokoma (immediate past Director-General), Dr. Emmanuel Enu Attah (Director, Planning and Research) and others is hereby acknowledged.

The strategic guidance offered by members of the Survey Management Committee (SMC) chaired by Dr. Jide Coker, NMCP National Coordinator, ensured an adequate level and distribution of funding and is highly acknowledged. Similarly, the dedication of members of the Survey Implementation Committee (SIC) through outstanding and enthusiastic management of the technical, administrative, and logistical phases of the survey is gratefully acknowledged. The survey would not have been a success without the able leadership of Mr. Sani Ali Gar (Project Director/SIC Chair) and the support of Dr. Oresanya Olusola (SIC Vice Chair) and Mr. Inuwa Bakari Jalingo (Project Coordinator). The untiring efforts of other members of the SIC who also served as coordinators is highly commended. I wish to express appreciation to ICF International for their technical assistance at all stages of the survey and for their continued choice of NPC for collaboration.

Special gratitude goes to the supervisors, interviewers, nurses, laboratory scientists, and drivers for their tireless efforts. The commitment of the entire field staff of the 2010 NMIS to ensuring a successful conduct of the survey is commendable. Similarly, for their important role in the timely processing of the data, the data processing team is commended.

The success of the 2010 NMIS was also made possible by the support and collaboration of a number of organisations and individuals. In this regard, I wish to acknowledge the financial support provided by the NMCP, Global Fund [through the Society for Family Health (SFH) and the Yakubu Gowon Centre (YGC)], World Bank, United Kingdom Department for International Development (DFID) [through the Support to Nigeria Malaria Programme (SuNMaP)], and USAID [through the MEASURE DHS programme at ICF International].

Finally, our appreciation goes to all the households and respondents who participated in the survey; without their participation and support, the much needed data for planning purposes would not have been collected

Jamin Dora Zubema
Director General,
National Population Commission,
Abuja
November 2011

ACRONYMS

ACT	Artemisinin-Based Combination Therapy
ANC	Antenatal Care
CSPro	Censuses and Surveys Processing
EA	Enumeration Area
FCT	Federal Capital Territory
FMoH	Federal Ministry of Health
GPS	Global Positioning System
ICF	Inner City Fund
IPT	Intermittent Preventive Treatment
ITN	Insecticide-Treated Net
LGA	Local Government Area
NMCP	National Malaria Control Programme
NMIS	Nigeria Malaria Indicator Survey
NPC	National Population Commission
NDHS	Nigeria Demographic and Health Survey
PSU	Primary Sampling Unit
RDT	Rapid Diagnostic Test
SFH	Society for Family Health
SP	Sulfadoxine-Pyrimethamine
TFR	Total Fertility Rate
UNAIDS	Joint United Nations Programmes on HIV and AIDS
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNU	United Nations University
USAID	United States Agency for International Development
WHO	World Health Organization
YGC	Yakubu Gowon Centre

NIGERIA


NIGER
CHAD
BENIN
CAMEROON
Sokoto
Kebbi
Zamfara
Katsina
Jigawa
Yobe
Borno
North West
Kano
Kaduna
Bauchi
Gombe
North East
Niger
Plateau
Adamawa
Kwara
FCT
Nasarawa
North Central
Taraba
Oyo
Osun
Ekiti
Kogi
Benue
South West
Ogun
Lagos
Ondo
Edo
Enugu
Cross River
Abambra
Ebonyi
Imo
Abia
South East
Delta
South South
Gulf of Guinea
Bayelsa
Rivers
Akwa Ibom
0
100
200
400
Kilometres
N

INTRODUCTION 1

1.1 HISTORY, GEOGRAPHY, AND ECONOMY

1.1.1 History

Nigeria came into existence as a nation-state in 1914 through an amalgamation of the Northern and Southern protectorates. Prior to that time, there were separate cultural, ethnic, and linguistic groups, such as the Oyo, Benin, Nupe, Jukun, Kanem-Bornu, and Hausa-Fulani. These peoples lived in kingdoms and emirates with traditional but sophisticated systems of government. Other relatively small—but strong and resistant—ethnic groups included the Igbo, Ibibio, and Tiv.

The British established a crown colony type of government. The affairs of the colonial administration were conducted by the British until 1942, when a few Nigerians became involved in the administration of the country. During the early 1950s, Nigeria achieved partial self-government with a legislature. The majority of its legislative members were elected into an executive council consisting mostly of Nigerians. Nigeria became fully independent in October 1960 as a federation of three regions (Northern, Western, and Eastern) under a constitution that provided for a parliamentary system of governance. The Lagos area became the Federal Capital Territory (FCT).

On October 1, 1963, Nigeria became a republic. Distinct administrative structures, social groups, and cultural traits reflect the diverse behaviour and background of the people. There are about 374 identifiable ethnic groups, of which the major ones are the Igbo, Hausa, and Yoruba.

Today, Nigeria consists of 36 states and a Federal Capital Territory.[1] The states and federal area are grouped into six zones: North Central, North East, North West, South East, South South, and South West. There are also 774 constitutionally recognised local government areas (LGAs) in the country.

1.1.2 Geography

Nigeria is in the West African sub-region, lying between latitudes 4º16' and 13º53' north and longitudes 2º40' and 14º41' east. It is bordered by Niger in the north, Chad in the northeast, Cameroon in the east, and Benin in the west. To the south, Nigeria is bordered by approximately 850 kilometres of the Atlantic Ocean, stretching from Badagry in the west to the Rio del Rey in the east. With a total land area of 923,768 square kilometres, Nigeria is the fourteenth largest country in Africa.

Nigeria is diverse in climate and topography, encompassing uplands (600 to 1,300 metres in the North Central zone), east highlands, and lowlands (less than 20 metres in the coastal areas). Additional lowlands extend from the Sokoto plains to the Borno plains in the North, the coastal lowlands in western Nigeria, and the Cross River basin in the East. The highland areas include the Jos, Plateau, and Adamawa highlands in the North, which extend down to the Obudu Plateau and Oban Hills in the South East. Other topographic features include the Niger-Benue Trough and Chad Basin.

Nigeria has a tropical climate. Wet and dry seasons are associated with the movement of the two dominant winds—the rain-bearing southwesterly winds and the cold, dry, and dusty northeasterly winds, commonly referred to as the Harmattan. The dry season occurs from October to March, with a spell of

[1] The FCT was moved from Lagos to Abuja in 1991.

coolness accompanied by the dry, dusty Harmattan wind, felt mostly in the North in December and January. The wet season occurs from April to September. The temperature in Nigeria oscillates between 25°C and 40°C, and rainfall ranges from 2,650 millimetres in the southeast to less than 600 millimetres in some parts of the north, mainly on the fringes of the Sahara Desert. The vegetation that results from these climatic differences consists of mangrove swamp forest in the Niger Delta and Sahel grassland in the north. Nigeria has a wide range of climatic, vegetation, and soil conditions, allowing potential for a wide range of agricultural production.

1.1.3 Economy

Agriculture has traditionally been the mainstay of Nigeria's economy. At the time of the country's independence, more than 75 percent of the country's formal labour force was engaged in agriculture, which also provided a satisfactory livelihood to more than 90 percent of the population. With the discovery of oil, petroleum usurped the dominant role of agriculture in the economy, especially in the country's foreign exchange earnings. By 2006, the contribution of agriculture to gross domestic product (GDP) was 32.5 percent, compared with 38.8 percent for oil and gas combined. Oil and gas now dominate the economy, contributing 99 percent of export revenues and 78 percent of government revenues. Within the non-oil sector, agriculture still plays a significant role, followed by industry, services, and wholesale/retail trade. Significant exports of liquefied natural gas commenced in late 1999, and these are slated to expand as Nigeria works to eliminate gas flaring.

The Nigerian financial system, which is critical to the domestic economy, remains relatively stable. Overall macroeconomic performance was satisfactory in 2010. Reforms in the banking sector, particularly in 2010, have weeded out weak institutions and restored eroding consumer confidence. Since the arrival of the democratic administration in 1999, economic policies have become more favourable to investment. Progress has been made toward establishing a market-based economy. Consequently, performance of the domestic economy has improved. Nigeria's GDP growth rate was estimated at 2.7 percent in 1999. This increased to 6.6 percent in 2004, declined slightly to 6.5 in 2005, 6.0 in 2006, and rose again to 6.5 percent in 2007. By 2010 the real GDP growth rate was estimated at 7.9 percent (Central Bank of Nigeria, 2011).

Before the advent of the civilian administration in 1999, Nigeria had a large public sector, comprised of more than 550 public enterprises in most sectors of the economy. The democratically-elected civilian administration recognised the importance of privatisation in the restructuring of the economy. A number of policies were put in place to liberalise, deregulate, and privatise key sectors of the economy, such as electricity, telecommunications, and downstream petroleum sectors. In recent years, Nigeria privatised the only government-owned petrochemical company and sold its interest in eight oil service companies. Although it may be too early to determine the full impact of privatisation and liberalisation on the Nigerian economy, it is believed that these economic policy reforms, combined with investments in human resources and physical infrastructure, as well as the establishment of macroeconomic stability and good governance, are essential to achieve a high rate of self-sustaining, long-term economic growth.

1.2 Background on Malaria in Nigeria

Nigeria bears up to 25 percent of the malarial disease burden in Africa, hence contributing significantly to the one million lives lost per year in the region, which mostly consists of children and pregnant women. Malaria in Nigeria is endemic and constitutes a major public health problem despite the curable nature of the disease. Malaria-related deaths account for up to 11 percent of maternal mortality. Additionally, they contribute up to 25 percent of infant mortality and 30 percent of under-5 mortality, resulting in about 300,000 childhood deaths annually. The disease overburdens the already-weakened

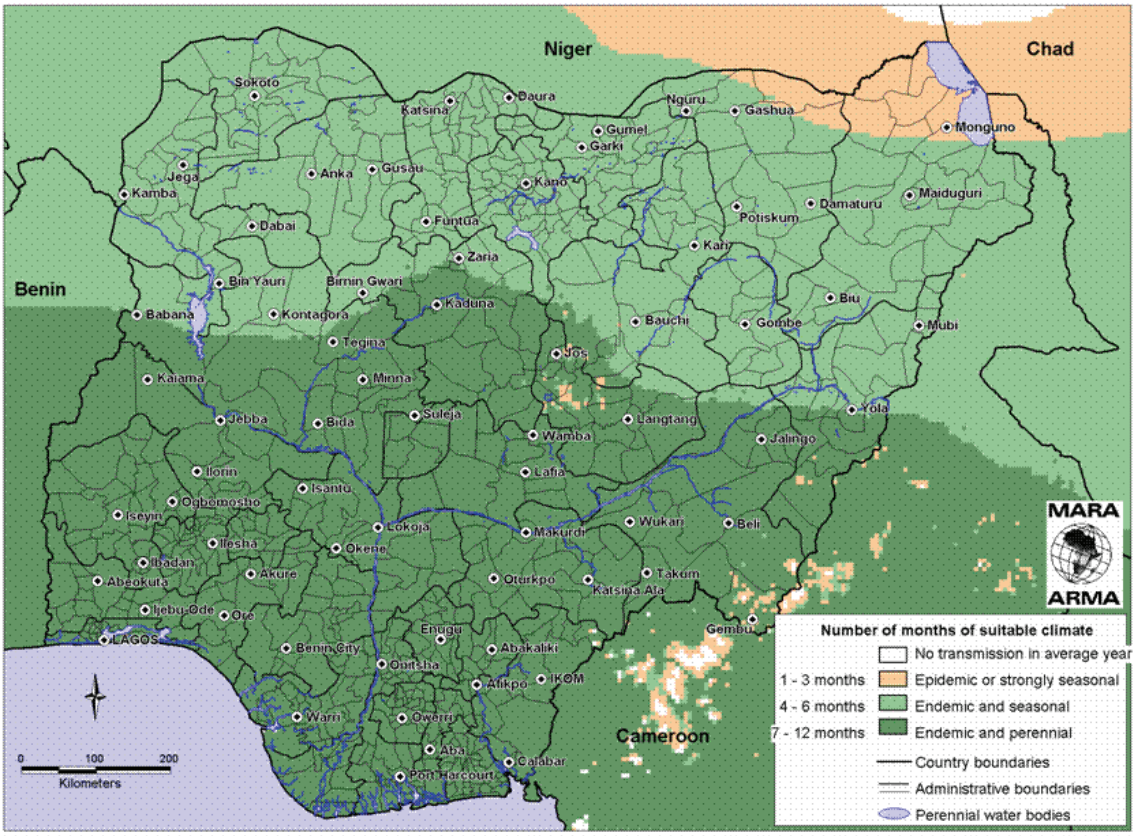
health system: nearly 110 million clinical cases of malaria are diagnosed each year, and malaria contributes up to 60 percent of outpatient visits and 30 percent of admissions. Malaria also exerts a huge social and economic burden on families, communities, and the country at large, causing an annual loss of about 132 billion Naira[2] in payments for treatment and prevention as well as hours not worked (Jimoh et al., 2007).

1.2.1 Malaria Transmission

The geographic location of Nigeria makes the climate suitable for malaria transmission throughout the country. It is estimated that up to 97 percent of the country's more than 150 million people risk getting the disease. The remaining 3 percent of the population who live in the mountains in southern Jos (the Plateau State) at an altitude ranging from 1,200 to 1,400 metres, are at relatively low risk for malaria.

The seasonality, intensity, and duration of the malaria transmission season vary according to the five ecological strata that extend from the South to the North. These include (1) mangrove swamps, (2) rain forest, (3) guinea-savannah, (4) Sudan-savannah, and (5) Sahel-savannah. The duration of the season decreases as one moves from the South to the North (Figure 1.1), being perennial in duration in most of the South but lasting three months or less in the northeastern region bordering Chad.

Figure 1.1 Duration of Malaria Transmission Season



This map is a product of the MARA/ARMA collaboration (http://www.mara.org.za). July 2001, Medical Research Council, PO Box 17120, Congella, 4013, Durban, South Africa
CORE FUNDERS of MARA/ARMA: International Development Research Centre, Canada (IDRC); The Wellcome Trust UK; South African Medical Research Council (MRC); Swiss Tropical Institute, Multilateral Initiative on Malaria (MIM) / Special Programme for Research & Training in Tropical Diseases (TDR), Roll Back Malaria (RBM).
Malaria seasonality model: Tanser, F et al. 2001. Paper in preparation. Topographical data: African Data Sampler, WRI, http://www.igc.org/wri/sdis/maps/ads/ads_idx.htm.

[2] 1 USD = 152 Nigerian Naira

The dominant vector species in Nigeria are the *Anopheles gambiae* species and the *A. funestus* group with some other species playing a minor or local role: *A. moucheti, A. nili, A. pharaoensis, A. coustani, A. hancocki.* and *A. longipalpis*. Within the *A. gambiae* complex, *A. gambiae* is the dominant species, with *A. arabiensis* being found most often in the North and *A. melas* only found in the mangrove coastal zone. A summary of the entomological inoculation rates (EIRs) reported in 86 studies from Nigeria suggests that rates for *A. gambiae species* ranges from 18 to 145 infective bites per person per year and for *A. funestus* from 12 to 54 infective bites per person per year (NMCP-FMoH, 2009).

The most prevalent species of malaria parasites in Nigeria is *Plasmodium falciparum* (> 95 percent). It is responsible for the most severe forms of the disease. The other types found in the country, *Plasmodium ovale* and *Plasmodium malariae,* play a minor role. *Plasmodium malariae* is commonly isolated from children with mixed infections.

1.2.2 Strategic Direction for Malaria Control

Nigeria was one of the countries included in the World Health Organization's (WHO's) first large-scale multilateral initiative for malaria control between 1955 and 1969. The initiative, known as the Malaria Eradication Programme, relied on massive indoor residual spraying of dichloro-diphenyl-trichloroethane (DDT). Although the goal was the complete eradication of malaria globally, it only succeeded in eliminating the disease from some regions, including southern Europe, the former USSR, and some countries of North Africa and the Middle East (Alilio et al., 2004).

Over the years, the strategies for malaria control have evolved. In 2000, Nigeria joined a league of other African countries to sign the Declaration and Plan of Action to halve the burden of the disease by the year 2010 through:

- prompt diagnosis and treatment with effective medicines
- distribution of insecticide-treated nets (ITNs) to achieve coverage of populations at risk (especially children under age 5 and pregnant women)
- indoor residual spraying (IRS) to curtail transmission
- prevention of malaria in pregnancy through intermittent preventive treatment

Nigeria has since implemented two strategic plans that prioritise the most biologically vulnerable groups: the first covering the period 2001-2005 and the second, which was originally planned to cover the period 2006-2010. In 2008, however, the strategic plan for 2006-2010 was revised to cover the 2009-2013 period to respond to the new global direction of malaria control efforts—which called for scaling up interventions not only among the biologically vulnerable groups but also among all populations at risk for malaria. The 2009-2013 National Strategic Plan for Malaria Control (NSPMC) in Nigeria was developed by the National Malaria Control Programme (NMCP), the Roll Back Malaria (RBM) partners, state and local government health authorities, and other stakeholders. This plan draws from the overall National Health Strategic Plan of the Federal Ministry of Health and addresses developmental priorities such as the RBM and Millennium Development Goals (MDGs).

The goal of the plan is to reduce by 50 percent the malaria-related morbidity and mortality in Nigeria by 2013 and to minimise the socioeconomic impact of the disease.

The overall objectives for 2009-2013 are

- To nationally scale up for impact (SUFI) a package of interventions, which include appropriate measures to promote positive behaviour change, prevention, and treatment of malaria

- To sustain and consolidate these efforts in the context of a strengthened health system, and to create the basis for the future elimination of malaria in the country.

The specific targets for malaria control during the five-year period (2009-2013) are

- To reduce malaria-related mortality by 50 percent by 2013. (This translates into an under-5 mortality rate reduction from 207 deaths per 1,000 live births in 2000 to 176 deaths per 1,000 live births in 2010, and 158 deaths per 1,000 live births in 2013.)

- To reduce malaria parasite prevalence in children under age 5 by 50 percent by the year 2013 compared with a baseline prevalence of 38 percent in 2007

- To increase net ownership to at least 80 percent of households [with two or more insecticide-treated nets (ITNs) and long-lasting insecticidal nets (LLINs)] by 2010 and to sustain this level until 2013

- To expand and sustain net usage (the percentage sleeping under an ITN) to at least 80 percent of children under age 5 and to pregnant women by 2010 and to sustain the coverage until 2013

- To introduce and scale up indoor residual spraying (IRS) to national household coverage of 8 percent in selected areas by 2010 and to 20 percent by 2013 as a complementary target to the ITN target, and to ensure at least 85 percent of targeted structures are sprayed with an adequate quality of chemicals

- To increase diagnostic malaria testing by 2013 to at least 80 percent of patients age 5 and older who come to health facilities to seek treatment for fever or malaria

- To increase appropriate and timely treatment (according to the national treatment guidelines for fever or malaria) of all patients who seek treatment for fever or malaria in health facilities to at least 80 percent by 2013

- To increase the coverage of pregnant women who receive at least two doses of intermittent preventive treatment (IPT) to 100 percent of pregnant women attending antenatal care (ANC) by 2013

1.2.3 Long-Lasting Insecticidal Net Campaigns

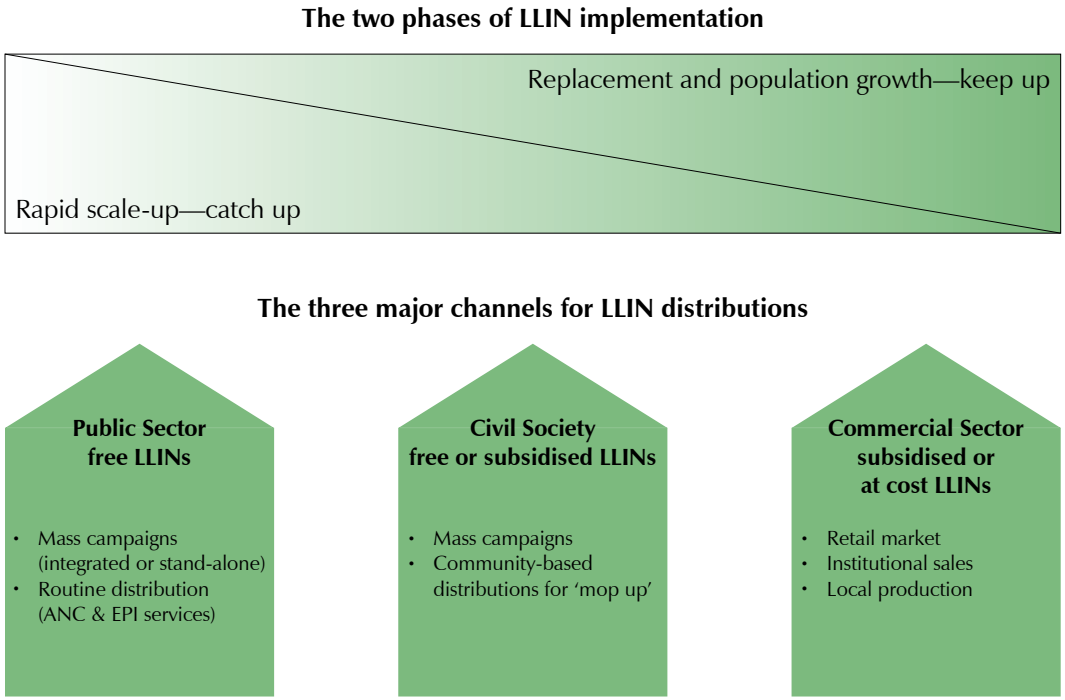
Integrated vector management (IVM), which includes the use of ITNs, indoor residual spraying (IRS), and environmental management, is a part of the multi-pronged strategies for malaria control in Nigeria. Several interventions have targeted specific areas within states, or throughout selected states, to distribute ITNs and long-lasting insecticidal nets (LLINs) for pregnant women and children under age 5.

One of the LLIN distribution campaigns is the World Bank Booster Project, which commenced in May 2007 with the procurement of 1.8 million LLINs that were distributed through collaborations with the Expanded Programme on Immunisation (EPI). The goal of the World Bank Booster Project is to boost malaria control over five years (2007-2011) in seven selected states—Anambra, Akwa Ibom, Bauchi,

Gombe, Jigawa, Kano, and Rivers states. The criteria for selection of the states included the following: (1) under-5 mortality rates exceeding 260 deaths per 1,000 live births; (2) documented *Plasmodium falciparum* resistance to chloroquine and sulphadoxine-pyrimethamine (SP) exceeding 85 percent; (3) demonstration of commitment by the state to implement large-scale campaigns to cut child mortality and/or a comprehensive malaria booster programme, and (4) the absence of other significant donor aid for malaria control in the state.

Nigeria adopted two strategies for the deployment of LLINs in the 2009-2013 NSPMC 'catch-up' and 'keep up' distribution campaign. The catch-up phase of the distribution is aimed at rapidly scaling up ownership of the nets through mass LLIN campaigns for universal coverage, and the keep-up phase is to maintain the coverage attained during the catch up through routine distribution of LLINs. Figure 1.2 further details the two phases.

Figure 1.2 Long-Lasting Insecticidal Net Campaign Scale Up



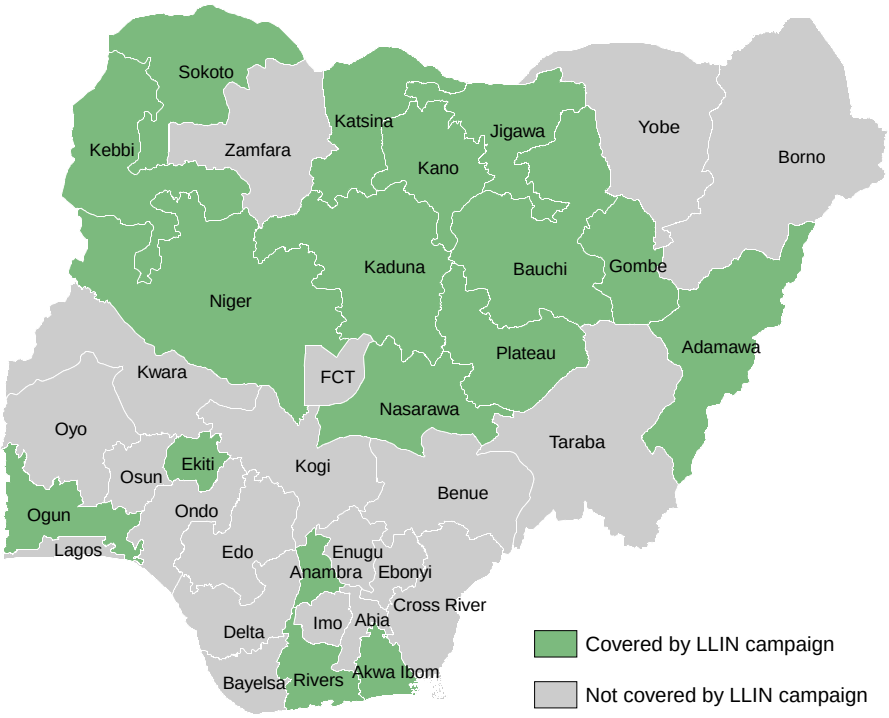
The implementation of the catch-up strategy has involved house-to-house distribution of net cards, which entitles every household to at least two LLINs. This strategy was meant to deliver over 63 million nets to the Nigerian population by the end of 2010. However, by October 2010 when data collection for the NMIS commenced, about 24 million LLINs had been distributed in 14 of the 36 states and the Federal Capital Territory. By the end of the year (between November and December 2010), three more states had been covered with another five million nets, bringing the total for the year to about 29 million nets across 17 states. Table 1.1 below shows the states covered by the campaigns and the lead partners responsible for these campaigns.

Table 1.1 States covered by universal mass LLIN campaigns and the lead partners involved

State	Lead Partner
Adamawa	UNICEF
Akwa Ibom	World Bank
Anambra	World Bank
Bauchi	World Bank
Ekiti	Global Fund-National Malaria Control Programme (NMCP)
Gombe	World Bank
Jigawa	World Bank
Kaduna	UNICEF/Global Fund
Kano	World Bank
Katsina	Global Fund-NMCP[1]
Kebbi	Global Fund-Yakubu Gowon Centre (YGC)
Nasarawa	Global Fund-NMCP[1]
Niger	Global Fund-Society for Family Health (SFH)
Ogun	Global Fund-Society for Family Health (SFH)
Plateau	Global Fund-NMCP[1]
Rivers	World Bank
Sokoto	UNICEF/Global Fund

Source: NMCP, Strategy 2009
[1] Covered in November/December 2010, after the data collection for the 2010 NMIS

Figure 1.3 Map of LLIN Distribution Coverage



Other LLIN distribution campaigns include government programmes that have distributed millions of LLINs to increase net coverage levels. Global Fund Malaria Grants have also allowed distribution of more than 4 million LLINs in 18 states between 2007 and 2009. Various net distribution campaigns exist in Nigeria. Throughout this report, some malaria indicator data are presented according to World Bank Booster Programme states, states with other LLIN campaigns, and states without LLIN campaigns.

1.2.4 Sources of Malaria Data in Nigeria

Routine malaria case reporting

In Nigeria, morbidity and mortality are measured through routine reports from health facilities through the malaria-specific and Health Management Information System (HMIS). However, the majority of malaria cases and deaths are not reported through health facilities. Moreover, most malaria cases registered in the private health facilities are not included in these data. Therefore, these data give an incomplete and under-represented picture of the true malaria burden in the country.

Sentinel sites for RBM activities

There are 14 malaria sentinel sites in the country, primarily set up for drug resistance and efficacy monitoring. The sentinel sites are being strengthened to generate routine surveillance data, including outpatient malaria morbidity; laboratory-confirmed cases of malaria based on positive smears and rapid diagnostic tests (RDTs); parasite densities; and antimalarial usage. This is in addition to the periodic drug therapeutic efficacy trials conducted at these sites to monitor drug resistance.

Health facility surveys

Health facility surveys employ tools and approaches developed to evaluate malaria control activities, particularly in the African region, using the Integrated Management of Childhood Illnesses (IMCI) instrument. These surveys assess health facilities, including the clinical skills of health care personnel, availability of supplies and equipment, inpatient clinical practices, dispensaries or pharmacy services, and the Health Information Systems (HIS). The advantage of using the IMCI instrument is that it addresses the integrated management of the sick child, including the treatment of malaria.

Nigeria also obtains data on childhood illnesses from the National Programme on Immunisation (NPI) and the Integrated Disease Surveillance and Response (IDSR) systems for the health facility surveys. Health facility surveys provide a broader range of information than the routine HMIS does.

Population-based surveys

Population-based surveys complement facility-based malaria data by providing strategic information to guide programmes. The Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) are based on nationally representative household samples that give national and subnational estimates of a range of demographic, health, and population indicators. Population-based surveys conducted in Nigeria include the 1990, 1999, 2003, and 2008 NDHS surveys; the 2005 Mid-term Evaluation Survey; the 2007 MICS survey; the 2007 Insecticide-Treated Nets Survey; the 2008 Health Facility Assessment; and the Monitoring Survey for the Malaria Control Booster Project, which used the Lots Quality Assurance Sampling (LQAS) methodology and was conducted in 2006 and 2010.

These surveys provide important data on malaria, including information on household ownership and use of mosquito nets, indoor residual spraying, intermittent preventive treatment for pregnant women, and treatment of childhood fever.

1.3 Objectives of the 2010 Nigeria Malaria Indicator Survey

The 2009-2013 National Strategic Plan for Malaria Control in Nigeria aims to massively scale up malaria control interventions in parts of the country. The 2010 Nigeria Malaria Indicator Survey (NMIS) was, therefore, designed to measure progress toward achieving the goals and targets of this strategic plan by providing data on key malaria indicators, including ownership and use of bed nets, diagnosis and

prompt treatment of malaria using artemisinin-based therapy (ACT), indoor residual spraying, and behaviour change communication.

The following are the specific objectives of the 2010 NMIS:

- To measure the extent of ownership and use of mosquito bed nets
- To assess the coverage of intermittent and preventive treatment programmes for pregnant women
- To identify practices used to treat malaria among children under age 5 and the use of specific antimalarial medications
- To measure the prevalence of malaria and anaemia among children age 6-59 months
- To determine the species of plasmodium parasite most prevalent in Nigeria
- To assess knowledge, attitudes, and practices regarding malaria in the general population

1.4 METHODOLOGY OF THE NIGERIA MALARIA INDICATOR SURVEY

The 2010 Nigeria Malaria Indicator Survey (NMIS) was commissioned by the National Malaria Control Programme (NMCP) and implemented by the National Population Commission (NPC) and other Roll Back Malaria partners. It was carried out from October to December 2010 on a nationally representative sample of more than 6,000 households. All women age 15-49 in the selected households were eligible for individual interviews. During the interviews, they were asked questions about malaria prevention during pregnancy and the treatment of fever among their children. In addition, the survey included testing for anaemia and malaria among children age 6-59 months using finger (or heel) prick blood samples. Test results were available immediately and were provided to the children's parents or guardians. Thick blood smears and thin blood films were also made in the field and transported to the Department of Medical Microbiology and Parasitology at the College of Medicine, University of Lagos. Microscopy was performed to determine the presence of malaria parasites and to identify the parasite species. Slide validation was carried out by the University of Calabar Teaching Hospital in Calabar.

As mentioned previously, the primary objectives of the 2010 NMIS project are to provide information on malaria indicators and malaria prevalence, both for the nation and for each of the country's six geopolitical zones. The 2010 NMIS is the first malaria indicator survey to conduct rapid diagnostic testing and to collect and evaluate thick blood smears and thin blood films at the household level in a nationally representative survey. Additionally, the 2010 NMIS represents the first malaria indicator survey conducted in all states and in the Federal Capital Territory (FCT) in Nigeria. The 2005 Mid-term Evaluation Survey designed to assess the Abuja targets covered only two randomly selected states in each zone, therefore spanning only 12 states (Oresanya et al., 2008).

1.4.1 Survey Organisation

A national Survey Management Committee (SMC), with members from the Roll Back Malaria partnership and a chair from the NMCP, provided strategic guidance and decision-making authority for the NMIS survey. The SMC developed a memorandum of understanding, signed by all implementing partners and agencies funding the survey, and ensured that the survey protocol was approved by the Nigeria Health Research Ethics Committee of the Federal Ministry of Health.

The Survey Implementation Committee (SIC) was responsible for the implementation of the 2010 NMIS. It consisted of eight members, with a NPC member serving as the chair and a NMCP member serving as vice-chair. More specifically, the SIC was responsible for recruitment, training, and monitoring of field staff, finalisation of survey instruments and tools, and general administrative management of the survey, including provision of maps and lists of households in selected clusters and oversight of day-to-day operations.

Technical assistance was provided by ICF International. ICF International staff assisted with overall survey design, sample design, questionnaire design, field staff training, field work monitoring, collection of biomarkers (anaemia testing, rapid diagnostic testing for malaria, and making and reading blood smears), data processing, data analysis, and report preparation.

1.4.2 Sample Design

The sample for the 2010 NMIS was designed to provide most of the key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of the six zones formed by grouping the 36 states and the Federal Capital Territory (FCT). The zones are as follows:

1. **North Central:** Benue, FCT—Abuja, Kogi, Kwara, Nasarawa, Niger, and Plateau
2. **North East:** Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe
3. **North West:** Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara
4. **South East:** Abia, Anambra, Ebonyi, Enugu, and Imo
5. **South South:** Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers
6. **South West:** Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo

The sampling frame used for the 2010 NMIS came from the 2006 Population and Housing Census of the Federal Republic of Nigeria, which was conducted in 2006 by NPC. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. In addition to these administrative units, during the 2006 Population Census, each locality was subdivided into convenient areas called census enumeration areas (EAs). Nigeria has 36 states and a Federal Capital Territory, making a total of 37 states for the purposes of the sampling frame. The primary sampling unit (PSU), referred to as a *cluster* for the 2010 NMIS, is defined on the basis of EAs from the 2006 EA census frame. The 2010 NMIS sample was selected using a stratified, two-stage cluster design consisting of 240 clusters, 83 in the urban areas and 157 in the rural areas. (The final sample included 239 clusters because access to one cluster was prevented by inter-communal disturbances.) A representative sample of approximately 6,000 households was selected for the survey, with a minimum target of 920 completed individual women's interviews per zone. Within each state, the number of households was distributed proportionately among urban and rural areas.

A complete listing of households was conducted, and a mapping exercise for each cluster was carried out from August through September 2010. The lists of households resulting from this exercise served as the sampling frame for the selection of households in the second stage. In addition to listing the households, the NPC listing enumerators used global positioning system (GPS) receivers to record the coordinates of the 2010 NMIS sample clusters.

In the second stage of the selection process, an average number of 26 households was selected in each cluster by equal probability systematic sampling. All women age 15-49 who were either permanent residents of the households in the 2010 NMIS sample or visitors present in the households on the night before the survey were eligible to be interviewed. In addition, all children age 6-59 months were eligible to be tested for malaria and anaemia.

1.4.3 Questionnaires

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

The **Household Questionnaire** was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, and relationship to the head of the household. The main purpose of the Household Questionnaire was to identify women who were eligible for the individual interview and children age 6-59 months who were eligible for anaemia and malaria testing. The Household Questionnaire also collected information on characteristics of the household's dwelling unit, such as the source of water; type of toilet facilities; materials used for the floor, roof, and walls of the house; ownership of various durable goods; and ownership and use of mosquito nets. In addition, the questionnaire was used to record the results of the anaemia and malaria testing as well as the signatures of the interviewer and the respondent who gave consent. Children's temperatures were also recorded.

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

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

1.4.4 Anaemia and Malaria Testing

The 2010 NMIS incorporated three biomarkers: anaemia testing, malaria testing using RDTs, and thick blood smear and thin blood film sample preparation on microscope slides. Blood samples were obtained by taking finger prick blood samples from children age 6-59 months to perform on-the-spot testing for anaemia and malaria, and to prepare the smears and films that were read in the Department of Medical Microbiology and Parasitology laboratory at the University of Lagos to determine the presence of malaria parasitaemia. Each field team included one laboratory scientist responsible for implementing the malaria and anaemia testing and making the blood smear slides. Each field team also included one nurse who, in addition to interviewing, was also responsible for ensuring that medications for malaria were given in accordance with the appropriate treatment protocols. Verbal and written informed consent

for testing of children was requested from the child's parent or guardian and recorded at the end of the household interview.

Anaemia testing. Due to a strong correlation between anaemia and malaria infection, the NMIS included anaemia testing for children age 6-59 months. After obtaining informed consent from the child's parent or guardian, blood samples were requested and collected using a microcuvette to obtain a drop of blood from a finger prick (or a heel prick in the case of young children with small fingers). Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue analyser, which produces a result within one minute. Results were given to the child's parent or guardian verbally and in writing. Parents of children with a haemoglobin level under 7 g/dl were instructed to take the child to a health facility for follow-up care. All households with children age 6-59 months were given a brochure explaining the causes and prevention of anaemia. Results of the anaemia testing were recorded on the Household Questionnaire.

Rapid malaria testing. Another major objective of the NMIS was to provide information about the extent of malaria infection among children age 6-59 months. Using the same finger or heel prick used for anaemia testing, a drop of blood was tested immediately using the Paracheck *Pf* rapid diagnostic test (RDT), which tests for *P. falciparum*. The test includes a loop applicator that comes in a sterile packet. A tiny portion of blood is captured on the applicator and placed on the well of the device. Results are available in 15 minutes. The results were provided verbally to the child's parent or guardian and recorded in the Household Questionnaire.

Children who tested positive for malaria were offered a full course of medicine according to standard procedures for treating malaria in Nigeria (FMOH, 2008; see Table 1.2), along with instructions on how to take the medication. To ascertain the correct dose, the team nurse asked about any medications that the child may be currently taking. The nurse weighed the child using the SECA portable scales and provided the appropriate dose of artemisinin-based combination therapy (ACT) along with instructions on how to administer the medicines to the child. The parents or guardians of all children who were tested were given information on how to prevent malaria. All drugs for malaria treatment were provided by the Society for Family Health (SFH) and NMCP.

Malaria testing. In addition to the Paracheck *Pf* RDT, a thick blood smear and thin blood film were prepared for all children tested. These blood smears were dried. Thin films were fixed with methanol analar in the field. The slides were then packed carefully in sturdy slide boxes in the field, collected from field teams at least once a week by a laboratory scientist, and then transported to the Department of Microbiology and Parasitology, University of Lagos, by air from all zones except the South West zone, due to proximity to the laboratory. Giemsa staining for the slides was performed at the laboratory, and microscopic reading and determination of malaria parasite presence and speciation was conducted. The purpose of the blood slides is to provide a 'gold standard' for the presence of parasites within the child's blood and to ascertain the type of parasite. The laboratory had ten experienced malaria microscope specialists working full-time or close to full-time for a period of about three months. Each slide was examined by two independent microscope specialists, and any discordant results were read by a third microscope specialist. An ICF International consultant provided additional in-service refresher training. ICF International also provided the computer software for documenting test results.

Table 1.2 Treatment for children with positive malaria test results on RDTs

Weight	Age	Artemether-Lumefantrine**
Less than 5 kg	Refer*	Refer*
5-14 kg	6 months-3 years	1 tablet twice a day for 3 days
15-25 kg	4-8 years	2 tablets twice daily for 3 days

* If child weighs less than 5 kgs, do not leave drugs. Tell parent to take child to a health facility.
** The second dose should be given eight hours after the first dose on the day of commencement of treatment.
Source: Nigeria FMoH, National Malaria and Vector Control Division, 2008. National Guidelines on Diagnosis and Treatment of Malaria. Abuja, Nigeria.

1.4.5 Pretest Activities

The training for the pretest took place August 16-22, 2010. Overall, 20 people participated in the training. Six female interviewers and four laboratory scientists were trained during the pretest. Six NPC staff members and three NMCP staff members led the training and served as supervisors for the pretest fieldwork. Participants were trained to administer questionnaires and collect biomarkers. The pretest training consisted of a project overview and survey objectives, techniques of interviewing, field procedures, a detailed description of all sections of the Household Questionnaire and the Woman's Questionnaire, and two days of field practice. The trainers and resource persons included professionals from NPC, NMCP, ICF International, SFH, and YGC.

The pretest fieldwork was conducted by three teams from August 19-22, 2010, in different EAs of Kaduna. The teams were divided according to languages. There was one Hausa team, one Yoruba team, and one Igbo team. The supervisors, who also served as editors, were drawn from the core technical team consisting of individual representatives of NPC and NMCP.

At the end of fieldwork, a debriefing session was held in Abuja on August 30, 2010, with all staff involved in the pretest, and the questionnaires were modified based on the findings from the pretest.

1.4.6 Training of Field Staff

NPC and NMCP recruited and trained 86 people for the main fieldwork. They served as supervisors/editors, interviewers, reserve interviewers, and quality control interviewers. Training of the field staff for the main survey was conducted September 16-30, 2010. The classroom training consisted of instruction regarding interviewing techniques and field procedures, a detailed review of items on the questionnaires, instruction for administering and obtaining parental/guardian consent to test children for anaemia and malaria, and mock interviews between participants in the classroom. There were also field practice interviews with real life individuals from areas outside the 2010 NMIS clusters.

Fifteen laboratory scientists underwent two weeks of training consisting of instruction and practice in collection of blood samples from children age 6-59 months. Additionally, 15 nurses were trained on taking children's temperature and offering and administering treatment to children who tested positive on the RDTs. During this period, 15 team supervisors/editors and 6 quality control interviewers were provided with additional training on field editing, data quality control procedures, and fieldwork coordination.

Fifteen supervisors/editors, 30 interviewers, 5 reserve interviewers, 15 nurses, and 15 laboratory scientists were selected for 15 data collection teams for the 2010 NMIS. Six additional laboratory scientists engaged in the logistics of transferring slides from the field to the central laboratory in Lagos.

1.4.7 Data Collection

Through its experience with field surveys such as NDHS and the Nigerian National Census, NPC has developed a field team structure that maximises data quality. Furthermore, the NMCP has had experience working with nurses and laboratory scientists. The existing data collection team capacity was used in the 2010 NMIS. As mentioned above, 15 data collection teams consisting of field interviewers, nurses, and laboratory scientists were formed to cover the 36 states and FCT. More specifically, each team consisted of one supervisor/editor (team leader), two female interviewers, one nurse/interviewer, one laboratory scientist, and one driver.

Six senior staff members from NPC and NMCP, designated as zonal coordinators, coordinated and supervised fieldwork activities. Roll Back Malaria (RBM) partners also monitored fieldwork.

Data collection took place over a three-month period, from October through December 2010. One quality control (QC) interviewer was assigned to each zone. The QC interviewers, however, did not travel with the survey teams. Instead, they trailed the teams to revisit and re-administer the Household and Women's questionnaires during the first two weeks of data collection and for two weeks prior to the end of the field work. The re-interviews were done in approximately 10 percent of all the completed households.

Field supervisors/editors were responsible for the quality of the work carried out by their respective teams. They travelled with their teams, assigned the work to the team members, and edited all questionnaires in the field to ensure they were complete and filled out correctly. Whenever possible, field editors also observed field interviews to ensure that the proper interviewing techniques and testing protocols were followed.

Coordinators and trainers who conducted the main training also monitored the data collection operations in their assigned zones. They were responsible for providing the SIC chairman and the project director with feedback and updates on field team activities. National monitors, comprised of staff of NMCP, RBM partners, and academia also monitored the field work to ensure high standards of data collection.

After the data were entered, zonal coordinators reviewed data frequencies and tables to identify any data inconsistencies and errors. Coordinators periodically travelled to visit their respective field teams to provide feedback and re-training as needed. To ensure a high level of quality and compliance with study protocols, ICF International staff conducted field observation visits. During these visits, ICF International staff handled field operational problems and proposed solutions, providing feedback and encouragement to the interviewers.

1.4.8 Data Processing

The processing of data for the 2010 NMIS ran concurrently with data collection. Completed questionnaires were retrieved by the zonal coordinators or the trainers and delivered to NPC in standard envelopes, labelled with the sample ID, team number, and state name. The shipment also contained a written summary of any issues detected during the data collection process.

The questionnaire administrators logged the receipt of the questionnaires, acknowledged the specified issues, and acted upon them if required. The data editors performed an initial check on the questionnaires, as well as coding of open-ended questions (with assistance from the data entry operators). The questionnaires were then assigned to the data entry operators. The data entry operators entered the data into the system, with the support of the data editors who handled erroneous or unclear data.

Data entry personnel were recruited from staff experienced in data entry activities from previous studies. The data entry team consisted of a supervisor, a data entry coordinator, and the data entry operators. Supervisors monitored the entire data entry and editing process, controlled the incoming questionnaires, assigned batches of questionnaires to the data entry operators, and managed the work progress. They were available at all times to ensure that proper procedures were followed and to help editors resolve inconsistencies. Data entry coordinators assisted with coordinating and overseeing the data entry process, assigning the work, tracking progress, and ensuring the quality and timeliness of the data entry process. Approximately 15 clerks were recruited and trained as data entry operators to enter all completed questionnaires and to perform the secondary entry for data verification. Two office editors and one secondary editor worked with the data entry operators to review information flagged as 'erroneous' or 'dubious' in the data entry process and to provide follow up and resolution for those anomalies.

Data entry and editing were accomplished using CSPro software. The processing of data was initiated in October 2010 and completed in February 2011.

1.5 RESPONSE RATES

The household and individual response rates for the 2010 NMIS are shown in Table 1.3. A total of 6,197 households were selected, and of these 5,986 were occupied. Of the occupied households, 5,895 had occupants who were successfully interviewed, yielding a household response rate of 99 percent. There are no significant differences in the household response rates between rural and urban areas.

In the interviewed households, a total of 6,527 women were identified as eligible for the individual interview, and 97 percent of them were successfully interviewed.

Table 1.3 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Nigeria 2010

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	2,095	4,102	6,197
Households occupied	1,991	3,995	5,986
Households interviewed	1,944	3,951	5,895
Household response rate[1]	97.6	98.9	98.5
Interviews with women age 15-49			
Number of eligible women	2,143	4,384	6,527
Number of eligible women interviewed	2,088	4,256	6,344
Eligible women response rate[2]	97.4	97.1	97.2

[1] Households interviewed/households occupied
[2] Respondents interviewed/eligible respondents

CHARACTERISTICS OF HOUSEHOLDS 2

This chapter presents summary information on socioeconomic characteristics of the households interviewed in the 2010 NMIS. A household is defined as a person or a group of persons, related or unrelated, who live together and share a common source of food. The Household Questionnaire (Appendix E) includes questions about age, sex, and relationship to the head of the household for all usual residents and visitors who spent the night preceding the interview in the house. This method of data collection allows the analysis of the results for either the de jure (usual) 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 durable goods. These items are used to create an index of relative wealth, which is described in this chapter.

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

The distribution of the de facto household population in the 2010 NMIS is shown in Table 2.1 by five-year age groups, according to sex and residence. Information was collected for more than 30,000 people in the selected households. Fifty percent of the de facto population is female, and 50 percent is male. The sex ratio (the number of men per 100 women) is 99. The ratio in rural areas is slightly lower than that of urban areas (99 compared with 101). The results show that the household population has more young people than old people. Forty-eight percent of the total population is under age 15 while 4 percent is age 65 or older. The proportion of the population in each age group declines as age increases; the youngest age group (< 5 years old) has the largest proportion of the population (20 percent), and this percentage decreases steadily to reach less than 1 percent for the oldest age groups (75 years or older). The distribution by age groups is similar for females and males.

Table 2.1 Household population by age, sex, and residence

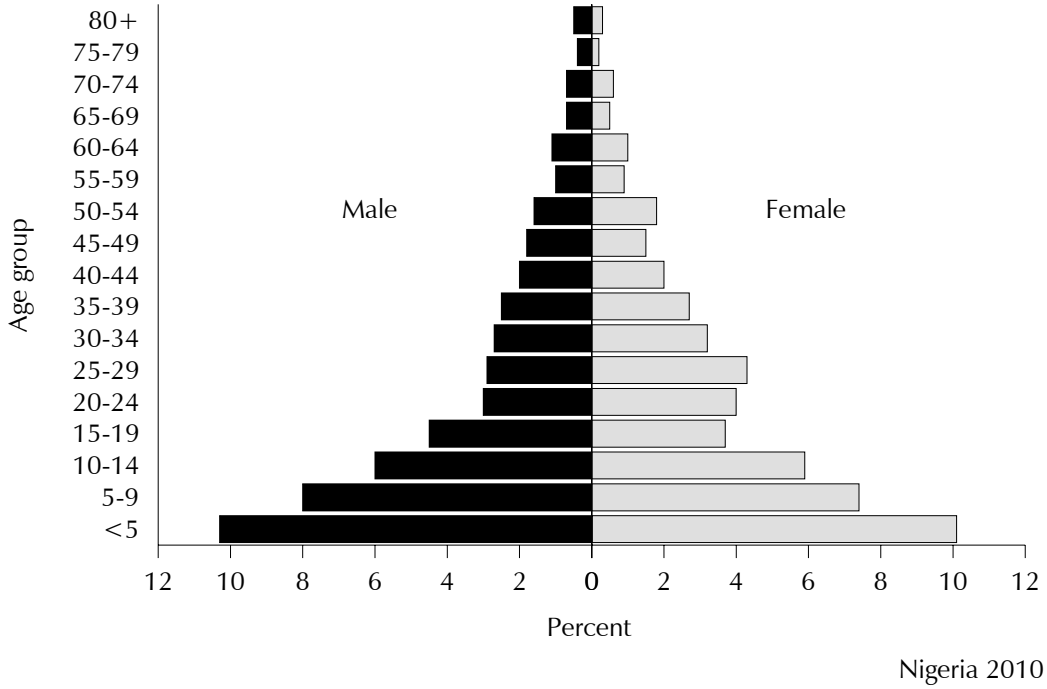
Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Nigeria 2010

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	17.7	17.2	17.4	21.8	21.2	21.5	20.7	20.2	20.4
5-9	14.7	13.2	13.9	16.6	15.3	16.0	16.1	14.8	15.4
10-14	11.8	12.4	12.1	12.2	11.6	11.9	12.1	11.8	12.0
15-19	9.5	8.3	8.9	8.9	7.1	8.0	9.0	7.5	8.2
20-24	7.1	8.9	8.0	5.6	7.7	6.7	6.0	8.0	7.0
25-29	7.2	9.1	8.1	5.4	8.3	6.9	5.9	8.5	7.2
30-34	6.5	7.1	6.8	5.1	6.3	5.7	5.5	6.5	6.0
35-39	5.8	5.3	5.5	4.6	5.3	5.0	4.9	5.3	5.1
40-44	4.4	4.2	4.3	3.9	3.8	3.9	4.0	3.9	4.0
45-49	3.5	3.1	3.3	3.6	3.0	3.3	3.6	3.1	3.3
50-54	3.4	3.7	3.6	3.1	3.5	3.3	3.2	3.5	3.4
55-59	2.2	1.8	2.0	2.0	1.8	1.9	2.1	1.8	1.9
60-64	2.4	2.3	2.3	2.1	1.9	2.0	2.2	2.0	2.1
65-69	1.2	1.3	1.2	1.5	1.0	1.2	1.4	1.0	1.2
70-74	1.2	0.9	1.1	1.4	1.2	1.3	1.4	1.1	1.2
75-79	0.6	0.5	0.6	0.9	0.3	0.6	0.8	0.4	0.6
80+	0.7	0.6	0.7	1.1	0.6	0.8	1.0	0.6	0.8
Don't know/missing	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	4,072	4,025	8,097	11,077	11,211	22,290	15,150	15,236	30,387

Note: Total includes 3 persons whose sex was not stated.

Figure 2.1 illustrates the age structure of the household population in a population pyramid. One feature of population pyramids is their strength in illustrating whether a population is 'young' or 'old'. The broad base of the pyramid indicates that Nigeria's population is young. This scenario is typical of countries with high fertility rates. The figure shows some underreporting of women age 15-19, presumably due to interviewers deliberately moving women from age 15 to age 14 in order to reduce their workload (also see Appendix Table C.1).

Figure 2.1 **Population Pyramid**



Nigeria 2010

2.2 HOUSEHOLD COMPOSITION

Information on key aspects of the composition of the households, including the household size, is presented in Table 2.2. These characteristics are important because they are associated with household welfare. The data show that the majority of households in Nigeria are headed by men (85 percent). About one in seven (15 percent) are headed by women. Female-headed households are more common in urban areas (19 percent) than in rural areas (14 percent). There has been a slight decrease in the proportion of female-headed households from 19 percent in the 2008 NDHS to 15 percent in the 2010 NMIS.

Table 2.2 shows that the average household size is 5.2 persons, compared with 4.4 persons in the 2008 NDHS. The average household size is lower in urban areas (4.8 persons) than in rural areas (5.4 persons). The proportion of households

Table 2.2 Household composition

Percent distribution of households by sex of head of household and by household size; mean size of household, and percentage of households with orphans and foster children under 18, according to residence, Nigeria 2010

Characteristic	Residence		Total
	Urban	Rural	
Household headship			
Male	80.7	86.4	84.7
Female	19.3	13.6	15.3
Total	100.0	100.0	100.0
Number of usual members			
1	12.9	9.5	10.5
2	10.7	9.1	9.6
3	14.0	12.2	12.8
4	14.9	13.7	14.0
5	13.0	13.8	13.6
6	11.2	11.4	11.3
7	8.9	8.8	8.8
8	4.1	6.5	5.8
9+	10.2	14.9	13.5
Total	100.0	100.0	100.0
Mean size of households	4.8	5.4	5.2
Number of households	1,720	4,175	5,895

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

with nine or more members is 14 percent, and this percentage is higher in rural areas (15 percent) than in urban areas (10 percent). Since 2008, there has been a large decrease in the proportion of single-member households and an increase in the proportion with 9 or more members.

2.3 HOUSEHOLD ENVIRONMENT

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

2.3.1 Drinking Water

Increasing access to improved drinking water is one of the Millennium Development Goals adopted by Nigeria and other nations worldwide (United Nations General Assembly, 2001). Table 2.3 shows the percent distribution of households and of population by the source of the household's drinking water. Sources that 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, tube well or borehole, protected well or spring, and rainwater. It should be noted, however, that even if water is obtained from an improved source, it may be contaminated during transportation or storage.

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 the de jure population by treatment of drinking water, according to residence, Nigeria 2010

	Households			Population		
Source of drinking water	Urban	Rural	Total	Urban	Rural	Total
Improved source	**79.2**	**49.4**	**58.1**	**76.9**	**47.0**	**55.0**
Piped water into dwelling/yard/plot	7.0	1.3	3.0	7.0	1.3	2.8
Public tap/standpipe	12.9	4.9	7.2	13.1	4.6	6.9
Tube well or borehole	35.2	23.3	26.8	36.0	22.3	25.9
Protected dug well	10.6	14.6	13.4	10.5	14.1	13.1
Protected spring	0.3	0.4	0.3	0.2	0.2	0.2
Rainwater	1.6	3.1	2.6	1.3	2.9	2.4
Bottled water	0.3	0.1	0.2	0.3	0.1	0.1
Water sachets[1]	11.4	1.7	4.5	8.5	1.5	3.4
Nonimproved source	**20.4**	**50.4**	**41.6**	**22.7**	**52.8**	**44.8**
Unprotected dug well	8.8	21.7	18.0	10.1	23.4	19.8
Unprotected spring	4.7	6.2	5.8	4.9	5.6	5.4
Tanker truck/cart with small tank	4.0	0.8	1.8	4.7	1.0	2.0
Surface water	2.8	21.6	16.1	3.0	22.8	17.6
Missing	0.5	0.2	0.3	0.4	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,720	4,175	5,895	8,178	22,475	30,653

[1] For purposes of this table, water sachets are considered to be an improved source; however, some water sold in sachets is likely to be unsafe.

Fifty-three percent of Nigerian households have an improved source of drinking water, similar to the figure of 56 percent reported in the 2008 NDHS. Urban households (68 percent) are much more likely than rural households (48 percent) to use an improved source of drinking water. The most common single source of drinking water is the tube well or borehole: 35 percent for urban households and 23 percent for rural households. Fifty percent of rural households obtain drinking water from non-improved sources,

with 22 percent obtaining water from an unprotected dug well and 22 percent obtaining their drinking water from surface water (lakes and ponds, rivers and streams). On the other hand, only one in five urban households uses an unimproved water source, with water sachets being the most commonly used source (11 percent).

2.3.2 Household Sanitation Facilities

Ensuring adequate sanitation facilities is another one of the Millennium Development Goals that Nigeria shares with other countries. A household is classified as having an improved toilet if the toilet is used only by members of one household (i.e., it is not shared with other households) and if the facility used by the household separates the waste from human contact (WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, 2004). Households without proper sanitation facilities are more exposed to the risk of diseases like dysentery, diarrhoea, and typhoid fever than those with improved sanitation facilities.

Table 2.4 presents data on the type of toilet facilities used by the household. Forty-three percent of Nigerian households use an improved toilet facility (64 percent of urban households and 34 percent of rural households). Over half (57 percent) use a nonimproved facility (36 percent of urban households and 66 percent of rural households). Overall, one-third of all households (34 percent) use no facility at all (21 percent of urban households and 40 percent of rural households).

Table 2.4 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Nigeria 2010

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved facility						
Flush to piped sewer system	18.7	3.8	8.1	17.1	3.4	7.0
Flush to septic tank	10.6	1.9	4.4	9.8	1.6	3.8
Flush to pit latrine	4.9	1.6	2.5	4.9	1.3	2.3
Flush to somewhere else	1.3	0.2	0.5	1.2	0.2	0.5
Flush, don't know where	0.1	0.0	0.0	0.1	0.1	0.1
Ventilated Improved Pit latrine (VIP)	4.0	1.8	2.4	4.2	1.8	2.4
Pit latrine with slab	24.4	24.9	24.7	25.1	26.0	25.7
Total improved facility	**64.0**	**34.2**	**42.6**	**62.4**	**34.4**	**41.8**
Nonimproved facility						
Pit latrine without slab/open pit	12.2	22.6	19.6	14.1	24.7	21.9
No facility/bush/field	20.5	39.5	33.9	20.0	37.5	32.8
Composting toilet	0.0	0.2	0.2	0.1	0.2	0.2
Bucket toilet	0.1	0.0	0.0	0.1	0.0	0.0
Hanging toilet/latrine	2.6	3.3	3.1	2.6	3.1	3.0
Missing	0.7	0.2	0.4	0.6	0.2	0.3
Total nonimproved facility	**36.1**	**65.8**	**57.2**	**37.5**	**65.7**	**58.2**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,720	4,175	5,895	8,178	22,475	30,653

It is difficult to compare the sanitation data from the 2010 NMIS with the data from the 2008 NDHS data for a few reasons. The 2008 NDHS asked respondents if the toilet facility was shared with other households. This question was not asked in the NMIS; therefore, it is not one of the criteria used to distinguish between an improved and nonimproved facility in Table 2.4. By comparison, the figures from the 2010 NMIS differ significantly from the 2008 NDHS in the categorization of the percentages of households with a flush toilet to a septic tank or a pit latrine, a ventilated improved pit latrine, and a pit latrine with a slab and without a slab. When reviewing the 2008 NDHS data without distinguishing if the facility is shared, the combined percentages of households with a flush toilet, which includes toilets flushing to a piped sewer system and to a septic tank, are within reasonable variations with the 2010 NMIS figures (15 and 13 percent, respectively). The data are similar when comparing the 2008 NDHS and 2010 NMIS data on the combined percentages of households with a pit latrine, which includes a VIP, a pit latrine with a slab, and a pit latrine without a slab. Both the 2008 NDHS and the 2010 NMIS reported 47 percent of households have a pit latrine, irrespective of type. One explanation for the observed differences may be confusion among the interviewers and respondents on classification regarding the specific type of flush toilets and pit latrine toilets during data collection in both the 2008 NDHS and 2010 NMIS surveys. Future surveys must improve interviewer training in the classification of toilet facilities.

2.3.3 Housing Characteristics

Table 2.5 presents information on a number of characteristics of the dwelling in which households live, such as the use of electricity; types of flooring, wall, and roof materials; number of sleeping rooms; and varieties of cooking fuel. These characteristics reflect the household's socioeconomic status. 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.

Table 2.5 Household characteristics

Percent distribution of households and de jure population by housing characteristics and percentage using solid fuel for cooking; and among those using solid fuels, percent distribution by type of fire/stove, according to residence, Nigeria 2010

	Households			Population		
Housing characteristic	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	79.8	34.9	48.0	78.0	34.0	45.7
No	19.5	64.5	51.4	21.4	65.4	53.6
Missing	0.7	0.6	0.6	0.6	0.6	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth, sand	16.0	52.3	41.7	18.4	53.6	44.2
Wood/planks	0.1	0.4	0.3	0.1	0.4	0.3
Parquet or polished wood	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl or asphalt strips	0.8	0.1	0.3	0.8	0.1	0.3
Ceramic tiles	2.8	1.1	1.6	3.1	1.0	1.5
Cement	66.6	41.5	48.8	65.6	41.0	47.6
Carpet	13.1	4.3	6.8	11.6	3.6	5.7
Missing	0.6	0.2	0.4	0.5	0.2	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main wall material						
Mud and sticks	13.2	37.4	30.4	14.0	37.2	31.0
Cane/palm/trunks	0.4	0.8	0.7	0.3	0.7	0.6
Straw, thatch mats	0.5	0.7	0.6	0.4	0.6	0.6
Mud bricks	7.3	25.1	19.9	8.7	27.4	22.4
Cement or stone blocks	70.1	30.8	42.2	67.0	29.0	39.1
Bricks	7.3	3.4	4.5	8.5	3.5	4.8
Wood planks/shingles	0.4	1.3	1.0	0.3	1.1	0.9
Other	0.1	0.3	0.3	0.1	0.3	0.3
Missing	0.7	0.2	0.3	0.5	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main roof material						
Thatch/palm leaf	8.5	27.7	22.1	9.2	28.7	23.5
Palm/bamboo/mats	0.1	3.6	2.6	0.2	3.7	2.8
Wood planks	0.5	2.4	1.8	0.9	2.9	2.3
Zinc, metal	72.3	56.2	60.9	73.6	55.5	60.3
Wood	0.4	0.9	0.8	0.4	1.3	1.0
Ceramic tiles	0.1	0.1	0.1	0.1	0.1	0.1
Concrete, cement	3.2	1.8	2.2	2.9	1.6	1.9
Asbestos sheets, shingles	14.2	7.1	9.2	12.2	6.0	7.7
Missing	0.6	0.2	0.3	0.5	0.2	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	37.1	28.4	30.9	22.9	16.5	18.2
Two	31.6	33.4	32.9	32.1	30.7	31.1
Three or more	30.8	38.0	35.9	44.6	52.6	50.5
Missing	0.5	0.2	0.3	0.4	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Electricity	0.4	0.1	0.2	0.4	0.1	0.2
LPG/natural gas/biogas	1.9	0.4	0.8	1.7	0.4	0.7
Kerosene	48.6	10.7	21.8	40.8	7.8	16.6
Coal/lignite	0.4	0.0	0.1	0.2	0.0	0.1
Charcoal	4.2	1.5	2.3	4.4	1.3	2.2
Wood	42.7	85.9	73.3	51.7	89.5	79.4
Straw/shrubs/grass	0.1	0.6	0.4	0.2	0.6	0.5
No food cooked in household	1.1	0.5	0.7	0.2	0.1	0.1
Missing	0.5	0.2	0.3	0.4	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	47.5	88.1	76.2	56.4	91.5	82.2
Number of households	1,720	4,175	5,895	8,178	22,475	30,653

LPG = Liquid petroleum gas

[1] Includes coal/lignite, charcoal, wood/straw/shrubs/grass, agricultural crops, and animal dung [list categories included in the country questionnaire]

Half of Nigerian households (51 percent) do not have electricity. Eighty percent of households in urban areas have access to electricity, compared with only 35 percent of households in rural areas.

Forty-two percent of households live in dwellings with earth or sand floors, while 49 percent live in dwellings with cement floors. Differences by urban-rural residence are large. Almost seven in ten (67 percent) urban households have cement floors compared with about four in ten (42 percent) rural households. More than half (52 percent) of rural households have earth or sand floors compared with only 16 percent of urban households. This information is important because flooring material used in dwellings is not only an indicator of household wealth status but also often an indicator of the quality of the health environment in which the household lives.

With regard to the main wall material of the dwelling, 42 percent of the households live in dwellings with cement or stone block walls, 30 percent live in structures with mud and stick walls, and 20 percent of households live in structures with mud brick walls. The majority of urban households live in dwellings with walls made of cement or stone blocks (70 percent), while the majority of rural households live in dwellings with mud and stick walls (37 percent).

Sixty-one percent of households in Nigeria live in dwellings with zinc or metal roofs, and 22 percent live in dwellings with thatch or palm leaf roofs. Seventy-two percent of urban households live in dwellings with zinc or metal roofs compared with 56 percent of rural households.

The number of rooms a household uses for sleeping is an indicator of socioeconomic level; it can also be used to assess crowding, which can facilitate the spread of disease. In the 2010 NMIS, household respondents were asked how many rooms were used for sleeping, regardless of whether the rooms were bedrooms or not. Results show that 31 percent of households use one room for sleeping, 33 percent use two rooms, and 36 percent use three or more rooms. Urban households (37 percent) are more likely than rural households (28 percent) to use only one room for sleeping.

Table 2.5 also shows the distribution of households by the type of fuel used for cooking, which relates to air quality in the household. Seventy-three percent of Nigerian households use wood for fuel, and 22 percent use kerosene. More than four in ten urban households use wood for cooking (43 percent) compared with more than eight in ten (86 percent) of rural households. Urban households are much more likely to use kerosene than rural households (49 percent versus 11 percent).

2.4 HOUSEHOLD POSSESSIONS

The availability of durable 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 messages; a refrigerator prolongs the wholesomeness of foods; and a means of transport allows access to many services that may be unavailable locally.

Table 2.6 shows the availability of selected consumer goods by residence. Sixty-nine percent of households have a radio, 60 percent have mobile phones, and 40 percent have televisions. There is noticeable urban-rural variation in the proportion of households owning these durable goods. The possession of each of the household effects listed in Table 2.6 is significantly higher in urban than in rural households.

Table 2.6 also shows the proportion of households owning various means of transport. Thirty-two percent of the households (25 percent in urban areas and 35 percent in rural areas) own a motorcycle or scooter, and 23 percent own a bicycle (11 percent in urban areas and 28 percent in rural areas). Only 10 percent of all households own a car or truck (18 percent in urban areas and 6 percent in rural areas), and 3 percent own an animal-drawn cart (2 percent in urban areas and 3 percent in rural areas).

Table 2.6 Household durable goods

Percentage of households and de jure population possessing various household effects, means of transportation, agricultural land and livestock/farm animals by residence, Nigeria 2010

	Households			Population		
Possession	Urban	Rural	Total	Urban	Rural	Total
Household effects						
Radio	74.7	66.3	68.7	76.8	70.1	71.9
Television	68.8	28.2	40.0	70.3	28.9	39.9
Mobile telephone	80.0	51.3	59.7	81.2	52.2	59.9
Non-mobile telephone	1.5	0.7	0.9	1.6	0.8	1.0
Refrigerator	32.0	7.9	15.0	34.9	8.3	15.4
Cable TV	11.1	3.1	5.4	12.4	3.4	5.8
Generating set	33.7	18.7	23.1	35.5	19.7	23.9
Air conditioner	3.8	0.5	1.5	4.5	0.5	1.6
Computer	7.3	1.2	3.0	7.1	1.3	2.8
Electric iron	56.8	15.7	27.7	56.1	15.9	26.7
Fan	70.4	23.8	37.4	70.2	23.8	36.2
Means of transport						
Bicycle	10.8	28.4	23.3	14.7	33.0	28.1
Animal drawn cart	1.7	3.4	2.9	2.0	4.5	3.8
Motorcycle/scooter	24.8	35.4	32.3	29.7	40.8	37.9
Car/truck	18.0	6.2	9.7	20.7	7.1	10.7
Boat with a motor	0.5	0.1	0.2	0.8	0.1	0.3
Number	1,720	4,175	5,895	8,178	22,475	30,653

2.5 WEALTH INDEX

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

Table 2.7 shows the percent distribution of the de jure household population by wealth quintile according to residence and region, and areas with a long-lasting insecticidal net (LLIN) malaria campaign. The distributions indicate the degree to which wealth is evenly (or unevenly) distributed geographically. The table shows that urban areas have higher proportions of people in the fourth and highest quintiles (28 and 49 percent, respectively) compared with rural areas (17 and 9 percent, respectively). On the other hand, rural areas have higher proportions of the population in the lowest and second quintiles (25 percent each) than urban areas (7 and 6 percent, respectively).

Furthermore, the three southern zones, which are more urbanised, have greater proportions of their populations in the higher wealth quintiles than the northern zones. For example, 40 percent of the population in South West is concentrated in the highest wealth quintile. The percentage of the population in the highest wealth quintile is 34 percent in South South and 31 percent in South East. By contrast the proportion of the population in the highest wealth quintile in North East is only 5 percent and in North West 7 percent.

Households residing in states targeted by the World Bank Booster campaign are fairly evenly distributed across wealth quintiles, while areas targeted by other campaigns include households concentrated in the second and middle wealth quintiles (31 and 32 percent, respectively).

Also included in Table 2.7 is the Gini coefficient, which indicates the level of concentration of wealth. A low Gini coefficient indicates a more equal distribution (0 being total equality), while a high Gini coefficient indicates more unequal distribution (100 corresponds to total unequal distribution). Survey results show that wealth is relatively more evenly distributed in urban areas (19 percent) than in rural areas (23 percent). Among the zones, wealth is most evenly distributed in South East (12 percent) and least evenly distributed in North Central (25 percent). There are no major variations in the Gini coefficient among areas for LLIN malaria campaigns.

Table 2.7 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles and the Gini coefficient, according to residence and region, Nigeria 2010

Residence/region	Wealth quintile					Total	Number of population	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	7.2	5.9	9.8	27.9	49.2	100.0	8,178	18.5
Rural	24.7	25.1	23.8	17.1	9.3	100.0	22,475	23.2
Zone								
North Central	18.9	24.7	24.6	15.9	15.9	100.0	5,076	25.3
North East	48.8	24.6	14.2	7.2	5.2	100.0	4,854	16.8
North West	27.6	30.2	23.9	11.9	6.5	100.0	8,034	18.5
South East	1.5	3.2	19.2	44.8	31.3	100.0	3,107	11.5
South South	5.6	7.6	18.7	34.0	34.2	100.0	4,263	17.4
South West	5.7	15.6	16.8	22.2	39.7	100.0	5,320	20.6
Areas for LLIN malaria campaigns[1]								
World Bank Booster[1]	24.1	19.8	18.1	18.9	19.1	100.0	6,924	27.7
Others with campaigns[2]	13.6	30.6	32.0	11.7	12.1	100.0	5,602	24.8
Others with no campaigns[3]	20.4	16.8	17.1	23.0	22.8	100.0	18,127	25.5
Total	20.0	20.0	20.0	20.0	20.0	100.0	30,653	26.6

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

CHARACTERISTICS OF RESPONDENTS 3

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

3.1 GENERAL CHARACTERISTICS OF WOMEN

Table 3.1 presents the distribution of women age 15-49 by age group, residence, education level, and wealth quintile. In general, the proportion of respondents in each age group declines as age increases, reflecting the comparatively young age structure of the population. The slightly lower proportion of women who are categorised as age 15-19 compared with those age 20-24 and age 25-29 could be due to deliberate age misreporting on the part of interviewers.

Table 3.1 Background characteristics of women

Percent distribution of women age 15-49 by selected background characteristics, Nigeria 2010

Background characteristic	Weighted percent	Number of women: Weighted	Number of women: Unweighted
Age			
15-19	17.2	1,091	1,100
20-24	18.4	1,165	1,139
25-29	20.1	1,273	1,285
30-34	15.1	957	951
35-39	12.6	802	808
40-44	9.4	597	602
45-49	7.2	459	459
Residence			
Urban	28.4	1,803	2,088
Rural	71.6	4,541	4,256
Zone			
North Central	16.4	1,039	1,079
North East	15.0	951	1,087
North West	25.0	1,584	1,205
South East	10.7	681	1,011
South South	15.1	959	1,124
South West	17.8	1,130	838
Areas for LLIN malaria campaigns			
World Bank Booster[1]	23.1	1,463	1,559
Others with campaigns[2]	18.7	1,188	1,111
Others with no campaigns[3]	58.2	3,693	3,674
Education			
No education	42.5	2,699	2,340
Primary	17.0	1,079	1,141
Secondary	32.9	2,084	2,331
More than secondary	7.6	483	532
Wealth quintile			
Lowest	18.4	1,165	996
Second	18.4	1,165	1,040
Middle	20.0	1,268	1,237
Fourth	20.1	1,275	1,461
Highest	23.2	1,472	1,610
Total 15-49	100.0	6,344	6,344

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.
[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Twenty-eight percent of the female respondents live in urban areas, and 72 percent live in rural areas. One in four women (25 percent) lives in the North West zone, followed by 18 percent who live in the South West zone, and 16 percent who live in the North Central zone.

The majority of women (58 percent) live in areas where there were no long-lasting insecticidal net (LLIN) malaria campaigns during the time of the survey. Almost one-quarter of women (23 percent) live in states where the World Bank Booster net campaign was conducted, and 19 percent of women live in states with other net campaigns.

More than four in ten women have no education (43 percent), 17 percent have attended primary school, 33 percent have attended some secondary school, and only 8 percent have any education beyond secondary school.

3.2 Educational Attainment of Women

Education is a key determinant of the lifestyle and status an individual enjoys in a society. Studies have consistently shown that educational attainment has a strong effect on health behaviours and attitudes. In general, the higher the level of education that a woman attains, the more knowledgeable she is about the use of health facilities and health care services for herself, her children, and her family. Table 3.2 presents general educational characteristics of women and shows the relationship between the respondent's level of education and other background characteristics.

Generally, younger women have attained more education and have reached higher levels of education than older women. For example, only 34 percent of women age 15-24 have never been to school compared with 53 percent of women age 40-44 and 57 percent of women age 45-49. In addition, younger women are much more likely than older women to have completed secondary school. For example, 20 percent of women age 15-24 have completed secondary school compared with just 8 percent of women age 45-49.

Urban women are more likely to have attended school than rural women. Only 18 percent of urban women have never been to school compared with 52 percent of rural women. Urban women also stay in school longer, 66 percent of urban women have attended secondary or higher education compared with 30 percent of rural women.

The South East (3 percent) and South South (7 percent) zones have the lowest percentages of uneducated women, while the North West (80 percent) and North East (75 percent) zones have the highest percentages of uneducated women. The South East and South West zones have the highest proportions of women who have attained more than secondary schooling (13 and 14 percent, respectively) compared with 2-3 percent of women in the North West and North East zones.

Net campaigns are occurring in states where the proportion of women with no education is higher than the national average.

Table 3.2 also shows that poorer women are less educated than richer women. Most women in the lowest wealth quintile have no education (86 percent), compared with only 4 percent of women in the highest wealth quintile having no education. Only 5 percent of women in the lowest wealth quintile have at least some secondary education, compared with 82 percent of women in the highest wealth quintile.

Overall, the median number of years of education among survey respondents is 5 years.

Table 3.2 Educational attainment of interviewed women

Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median grade completed, according to background characteristics, Nigeria 2010

Background characteristic	Highest level of schooling						Total	Median years completed	Number of women
	No education	Some primary	Completed primary[1]	Some secondary	Completed secondary[2]	More than secondary			
Age									
15-24	34.0	4.5	7.6	28.8	19.5	5.7	100.0	6.9	2,256
15-19	28.0	4.8	6.6	45.1	14.2	1.3	100.0	7.4	1,091
20-24	39.7	4.3	8.4	13.5	24.4	9.7	100.0	5.6	1,165
25-29	42.1	5.9	11.2	9.4	20.2	11.2	100.0	5.1	1,273
30-34	44.6	5.3	13.9	8.6	17.6	9.9	100.0	4.9	957
35-39	49.0	6.5	16.7	9.1	13.2	5.4	100.0	0.7	802
40-44	52.6	5.4	14.7	9.1	12.0	6.2	100.0	0.0	597
45-49	56.7	5.3	15.9	5.8	8.3	8.0	100.0	0.0	459
Residence									
Urban	18.4	3.7	11.5	20.5	30.2	15.7	100.0	10.3	1,803
Rural	52.1	6.0	11.7	14.0	11.8	4.4	100.0	0.0	4,541
Zone									
North Central	38.9	7.7	15.3	17.0	12.3	8.7	100.0	5.2	1,039
North East	74.7	3.0	5.1	7.9	6.5	2.8	100.0	0.0	951
North West	79.9	3.8	4.2	4.9	5.4	1.8	100.0	0.0	1,584
South East	3.2	6.3	15.6	26.9	34.8	13.3	100.0	10.7	681
South South	7.3	5.8	21.6	24.0	32.1	9.3	100.0	9.1	959
South West	20.2	6.3	13.5	23.1	23.0	13.9	100.0	8.6	1,130
Areas for LLIN malaria campaigns									
World Bank Booster[3]	51.1	4.2	8.4	11.8	18.1	6.4	100.0	0.0	1,463
Others with campaigns[4]	65.1	2.7	6.5	9.6	8.7	7.4	100.0	0.0	1,188
Others with no campaigns[5]	31.9	6.6	14.6	19.4	19.3	8.1	100.0	5.8	3,693
Wealth quintile									
Lowest	85.9	4.5	4.9	3.5	1.0	0.1	100.0	0.0	1,165
Second	68.8	6.1	11.0	9.8	3.8	0.6	100.0	0.0	1,165
Middle	50.4	6.5	13.2	17.1	10.7	2.2	100.0	0.0	1,268
Fourth	15.4	6.8	18.1	27.1	25.7	7.0	100.0	8.1	1,275
Highest	4.2	3.1	10.7	19.5	38.1	24.3	100.0	11.3	1,472
Total	42.5	5.3	11.7	15.8	17.0	7.6	100.0	5.2	6,344

[1] Completed 6th grade at the primary level
[2] Completed 6 years at the secondary level
[3] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[4] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[5] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

3.3 LITERACY OF WOMEN

The ability to read and write is an important personal asset, allowing individuals increased opportunities in life. Knowing the distribution of the literate population can help those involved in health communication plan how to reach women with their messages. Instead of asking respondents if they could read, NMIS interviewers assessed the ability to read among women who had never been to school or who had attended only the primary level by asking them to read a simple, short sentence or part of the sentence. Table 3.3 shows the percent distribution of female respondents by level of literacy and the percentage literate according to background characteristics. Female respondents who had never attended school or who had attended school up to the primary level were asked to demonstrate literacy by reading from a card with a simple sentence in one of four languages (Hausa, Igbo, Yoruba, and English). The survey assumed that respondents who attended any secondary schooling are literate. The percentage literate (as presented in Table 3.3) includes respondents who could read part or all of a sentence, and those who attended secondary school or higher.

The data show that 50 percent of women age 15-49 are literate. There are large differentials in literacy across background characteristics. For example, only 38 percent of women age 45-49 are literate, compared with 67 percent of women age 15-19.

Urban-rural differentials are quite substantial, with 76 percent of urban women literate, compared with 40 percent of rural women. South East has by far the highest proportion of women who are literate (89 percent), while the North East and North West zones have the lowest (24 and 19 percent, respectively). Fifty-eight percent of women are literate among states with no net campaign. In states that conducted net campaigns, the proportion of women who are literate is lower than the national average. Literacy levels increase dramatically with increasing wealth quintiles, from 10 percent among women in the poorest wealth quintile to 91 percent of those in the highest quintile.

Table 3.3 Literacy of interviewed women

Percent distribution of women age 15-49 by level of schooling attended and level of literacy, and percentage literate, according to background characteristics, Nigeria 2010

Background characteristic	Secondary school or higher	No schooling or primary school: Can read a whole sentence	No schooling or primary school: Can read part of a sentence	No schooling or primary school: Cannot read at all	Missing	Total	Percentage literate[1]	Number of women
Age								
15-19	60.6	1.6	4.6	32.2	0.9	100.0	66.9	1,091
20-24	47.6	1.2	5.4	44.4	1.4	100.0	54.2	1,165
25-29	40.8	1.9	6.3	49.5	1.5	100.0	49.0	1,273
30-34	36.2	3.1	7.9	51.3	1.6	100.0	47.1	957
35-39	27.7	3.3	10.6	56.2	2.1	100.0	41.6	802
40-44	27.2	3.8	8.1	59.5	1.4	100.0	39.1	597
45-49	22.1	4.0	11.5	60.1	2.3	100.0	37.6	459
Residence								
Urban	66.4	2.3	7.8	21.5	2.1	100.0	76.4	1,803
Rural	30.2	2.4	6.9	59.1	1.3	100.0	39.6	4,541
Zone								
North Central	38.1	2.6	7.4	50.9	1.0	100.0	48.0	1,039
North East	17.2	0.4	6.1	75.8	0.5	100.0	23.7	951
North West	12.2	2.2	5.0	79.4	1.3	100.0	19.3	1,584
South East	74.9	3.4	10.8	9.8	1.0	100.0	89.1	681
South South	65.4	2.3	9.9	20.7	1.7	100.0	77.6	959
South West	60.0	3.7	6.4	26.4	3.4	100.0	70.2	1,130
Areas for LLIN malaria campaigns								
World Bank Booster[2]	36.3	1.8	5.9	54.9	1.2	100.0	44.0	1,463
Others with campaigns[3]	25.7	1.6	5.1	65.1	2.5	100.0	32.4	1,188
Others with no campaigns[4]	46.9	2.9	8.4	40.5	1.4	100.0	58.1	3,693
Wealth quintile								
Lowest	4.6	0.6	4.2	90.1	0.4	100.0	9.5	1,165
Second	14.1	1.5	7.5	75.1	1.6	100.0	23.1	1,165
Middle	30.0	3.1	8.0	56.5	2.4	100.0	41.0	1,268
Fourth	59.8	3.7	10.1	24.4	2.0	100.0	73.6	1,275
Highest	82.0	2.8	6.0	8.0	1.2	100.0	90.8	1,472
Total	40.5	2.4	7.2	48.4	1.5	100.0	50.0	6,344

[1] Refers to women who attended secondary school or higher and women who can read a whole sentence or part of a sentence
[2] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

KNOWLEDGE OF MALARIA AND FEVER MANAGEMENT 4

4.1 WOMEN'S KNOWLEDGE OF MALARIA

4.1.1 Knowledge of Malaria Symptoms

To assess basic knowledge about malaria, all women who were interviewed in the 2010 Nigeria Malaria Indicator Survey (NMIS) were asked if they had ever heard of malaria. If they responded affirmatively, they were then asked if they could name any symptoms of malaria (specifically, 'what are some things that can happen to you when you have malaria?'). Results are shown in Table 4.1. Percentages may sum to more than 100 because respondents could give more than one response.

Table 4.1 Knowledge of malaria symptoms

Percentage of all women age 15-49 who have ever heard of malaria and, among them, percentage who know various symptoms of malaria, by background characteristics, Nigeria 2010

	Among all women		Among women who have ever heard of malaria, percentage who cite specific symptoms									
Background characteristic	Percentage who know about malaria	Number of women	Fever	Chills/ shivering	Headache	Joint pain	Poor appetite	Vomiting	Convul-sion	Other	Don't know any	Number of women
Age												
15-19	90.9	1,091	61.5	40.2	56.3	31.3	20.6	23.6	4.1	0.3	2.6	992
20-24	94.4	1,165	68.7	44.2	53.9	30.1	22.3	22.6	4.3	0.1	1.6	1,100
25-29	95.3	1,273	66.2	46.3	55.2	29.7	22.7	22.7	2.7	0.1	1.7	1,213
30-34	95.8	957	67.8	43.1	51.8	30.2	23.3	22.6	2.0	0.9	2.0	917
35-39	95.3	802	67.4	46.7	52.3	31.8	24.1	23.0	2.7	0.0	2.0	764
40-44	94.6	597	64.3	47.5	56.6	33.1	21.7	22.0	3.0	0.6	2.1	565
45-49	95.9	459	72.6	45.4	58.6	34.5	23.3	19.0	2.9	0.1	0.8	440
Residence												
Urban	98.3	1,803	66.0	47.6	60.4	33.6	27.9	22.5	3.7	0.4	0.8	1,772
Rural	92.9	4,541	66.8	43.2	52.2	30.0	20.2	22.5	2.9	0.3	2.3	4,219
Zone												
North Central	87.9	1,039	52.7	53.7	67.8	37.3	11.0	7.2	0.5	0.4	3.3	913
North East	92.8	951	83.3	22.8	56.7	27.9	35.7	48.8	7.5	0.2	1.6	882
North West	94.6	1,584	71.4	51.1	56.4	31.6	19.3	34.5	5.6	0.4	1.4	1,499
South East	99.5	681	75.5	39.8	52.8	22.0	19.2	10.8	0.7	0.0	2.2	678
South South	96.9	959	78.0	46.4	44.0	25.9	28.9	13.9	1.7	0.1	1.5	929
South West	96.4	1,130	42.9	46.7	49.7	37.7	22.4	12.1	1.4	0.7	1.6	1,089
Areas for LLIN malaria campaigns												
World Bank Booster[1]	94.8	1,463	81.0	47.5	54.3	28.3	24.7	32.6	4.4	0.2	1.6	1,386
Others with campaigns[2]	94.2	1,188	52.2	44.3	56.5	33.2	19.7	20.4	3.6	0.9	1.0	1,119
Others with no campaigns[3]	94.4	3,693	65.5	43.4	54.2	31.5	22.5	19.2	2.5	0.2	2.3	3,485
Education												
No education	91.1	2,699	65.9	40.6	54.5	29.9	19.7	28.5	3.5	0.4	2.2	2,457
Primary	94.5	1,079	66.2	46.9	51.4	33.8	21.3	15.2	2.3	0.1	1.5	1,019
Secondary	97.6	2,084	66.6	46.3	53.7	29.2	23.8	18.2	2.9	0.2	2.0	2,033
More than secondary	99.6	483	71.1	51.7	65.6	39.3	33.6	25.3	4.3	0.5	0.6	481
Wealth quintile												
Lowest	91.0	1,165	73.7	34.8	57.2	29.7	20.7	30.4	3.0	0.1	2.2	1,059
Second	90.8	1,165	65.7	44.5	53.1	32.2	20.6	25.7	3.3	0.1	1.9	1,057
Middle	93.6	1,268	61.9	44.5	50.6	28.5	16.1	19.2	3.5	0.8	2.6	1,187
Fourth	97.1	1,275	70.4	46.7	52.4	28.2	23.3	19.2	3.5	0.2	1.8	1,238
Highest	98.5	1,472	62.7	49.7	59.1	35.9	29.8	20.0	2.7	0.3	1.1	1,450
Total	94.4	6,344	66.6	44.5	54.6	31.1	22.5	22.5	3.2	0.3	1.9	5,991

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

The results show that knowledge of malaria is almost universal. Ninety-four percent of women have heard of malaria, a statistic that varies little by background characteristics. More than 90 percent of women in all groups have heard of malaria, except in North Central, where only 88 percent of women report having heard of malaria.

When women who had heard about malaria were asked about symptoms of malaria, the most common responses were fever (mentioned by 67 percent of women) and headache (55 percent). Forty-five percent of women responded that chills were a symptom of malaria, and 31 percent stated that joint pain is a symptom. Twenty-three percent of women reported poor appetite and vomiting as symptoms. Three percent of women said that convulsions were a symptom of malaria. Only 2 percent of women did not know any symptoms of malaria.

Differences in the reporting of malaria symptoms by background characteristics vary by zones, with LLIN campaign areas having sizeable differences. Women in North East are almost twice as likely as those in South West to report fever as a symptom of malaria (83 percent and 43 percent, respectively).

4.1.2 Knowledge of Causes of Malaria and Age Groups Most Likely to be Affected by Malaria

Lack of knowledge about how malaria is spread interferes with the ability to take appropriate preventive measures. Women were asked several questions to ascertain their knowledge of the causes of malaria. Table 4.2 presents information on responses provided by women age 15-49 when they were asked what causes malaria and which groups of people are most likely to get a serious case of malaria. Interviewers recorded and Table 4.2 presents, as many responses as women provided, in other words, a respondent may have mentioned more than one cause and more than one group of people.

Eighty-two percent of women know that malaria is caused by mosquitoes, while 27 percent say malaria is caused by dirty surroundings, and 12 percent say malaria is caused by the presence of stagnant water. Six percent of women say that eating certain foods causes malaria, and 8 percent of women responded that they did not know what causes malaria.

When asked which groups of people are most likely to get a serious case of malaria, 64 percent of women report that children are most likely to be affected by malaria, 43 percent of women report that everyone is vulnerable, and 26 percent say that pregnant women are most vulnerable. Eighteen percent of women say that adults are most likely to be affected, and 9 percent say the elderly are most vulnerable. Five percent of women responded that they do not know who is most likely to be affected by malaria.

Table 4.2 Knowledge of causes of malaria and people most likely to be seriously affected by malaria

Among women age 15-49 who have ever heard of malaria, the percentage who cite specific causes of malaria and the people most likely to be affected by malaria, according to background characteristics, Nigeria 2010

Background characteristic	Perceived causes of malaria						People most likely to be affected by malaria						Number of women
	Mosquitoes	Stagnant water	Dirty surroundings	Certain foods	Other	Don't know	Children	Pregnant women	Adults	Elderly	Everyone	Don't know	
Age													
15-19	79.1	10.9	26.8	7.1	4.6	8.7	57.1	18.2	19.5	8.9	42.8	6.9	992
20-24	81.0	11.1	26.7	5.9	6.3	8.4	66.9	26.7	16.3	9.5	40.7	5.7	1,100
25-29	82.7	12.3	29.2	4.9	6.0	7.6	66.3	30.7	18.5	9.1	42.5	3.6	1,213
30-34	83.0	10.0	24.0	5.8	7.7	7.3	63.1	27.9	16.3	8.1	41.8	4.3	917
35-39	81.7	13.0	26.3	5.2	7.2	7.9	67.0	27.3	17.9	8.9	43.1	2.7	764
40-44	80.2	11.2	25.4	4.5	8.6	7.2	68.1	25.3	20.5	8.9	43.3	3.7	565
45-49	85.5	12.2	25.5	4.2	8.0	5.2	62.2	23.7	16.0	8.8	49.8	5.0	440
Residence													
Urban	84.5	19.2	32.2	6.6	6.4	5.5	61.8	26.4	21.2	11.8	42.8	3.5	1,772
Rural	80.5	8.2	24.2	5.1	6.7	8.6	65.4	25.8	16.4	7.7	42.9	5.1	4,219
Zone													
North Central	83.9	8.5	16.2	1.9	3.2	8.4	64.8	40.0	14.1	9.5	29.6	7.9	913
North East	80.8	4.4	30.4	0.3	1.3	9.6	81.8	9.5	42.9	14.2	28.4	5.4	882
North West	86.4	9.6	26.5	0.5	3.8	5.3	77.0	34.7	6.1	5.5	54.1	2.2	1,499
South East	82.7	17.6	22.6	14.1	9.1	5.3	50.5	24.3	10.0	12.6	37.5	5.0	678
South South	87.4	17.0	39.7	9.6	6.8	4.8	68.1	34.6	15.5	8.1	39.3	6.0	929
South West	68.6	13.8	23.6	11.0	16.0	12.8	37.9	9.4	23.9	7.2	56.3	3.3	1,089
Areas for LLIN malaria campaigns													
World Bank Booster[1]	85.7	10.6	32.5	4.1	3.4	6.8	70.2	38.7	11.0	8.4	48.0	6.1	1,386
Others with campaigns[2]	83.7	7.6	21.8	3.0	7.7	7.3	68.7	22.2	19.9	9.8	38.9	3.1	1,119
Others with no campaigns[3]	79.4	13.1	25.7	6.9	7.5	8.2	60.6	22.2	19.9	8.8	42.0	4.5	3,485
Education													
No education	79.6	4.4	19.9	1.8	4.6	10.0	71.9	23.4	16.8	8.2	41.6	4.5	2,457
Primary	76.0	11.0	23.4	7.9	9.7	9.8	59.2	26.8	17.3	9.5	43.7	5.6	1,019
Secondary	84.2	17.6	33.4	8.6	7.4	5.5	58.8	26.6	19.6	8.7	43.2	4.9	2,033
More than secondary	93.5	22.4	38.9	6.7	6.8	1.1	60.1	35.0	16.9	11.9	45.7	2.3	481
Wealth quintile													
Lowest	81.7	4.3	16.2	1.4	1.1	10.2	74.3	20.0	20.7	8.9	38.9	6.2	1,059
Second	79.8	5.4	21.1	3.9	6.2	10.0	69.5	26.3	17.1	8.5	43.4	4.7	1,057
Middle	76.9	6.9	23.9	5.5	8.7	9.6	63.1	23.2	16.2	7.1	43.4	4.4	1,187
Fourth	81.5	16.3	30.3	8.3	8.0	6.8	59.1	29.0	15.9	9.9	44.6	5.7	1,238
Highest	87.0	20.7	37.1	7.4	8.1	3.4	58.9	29.9	19.4	9.9	43.2	2.7	1,450
Total	81.7	11.5	26.6	5.5	6.6	7.7	64.4	26.0	17.9	8.9	42.8	4.6	5,991

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

4.1.3 Knowledge of Ways to Avoid Malaria

Women were also asked during the survey if they know of ways to avoid getting malaria. Those who knew ways to avoid getting malaria were further asked to name specific ways. Table 4.3 shows responses provided by women age 15 to 49.

Ninety-two percent of women described ways to avoid getting malaria. Although the percentage of women who say there are ways to avoid getting malaria does not vary much by age or residence, greater variation is observed among zones—from 85 percent of women in South West reporting that they know ways to avoid malaria to 97 percent of women in North West. Women living in areas with LLIN malaria campaigns are somewhat more likely to report that there are ways to avoid malaria than women who live in areas without campaigns. Women with a primary education are least likely to report that there are ways to avoid malaria compared with women who have either no education or else a secondary or higher education.

Table 4.3 Knowledge of ways to avoid malaria

Among women age 15-49 who have ever heard of malaria, the percentage who say there are ways to avoid getting malaria, and among women saying there are ways to avoid getting malaria, the percentage who cite specific ways of avoiding malaria, according to background characteristics, Nigeria 2010

Background characteristic	Percentage who say there are ways to avoid getting malaria	Number of women	Among women who say there are ways to avoid getting malaria, percentage who cite specific ways to avoid malaria											
			Sleep under mosquito net	Sleep under an ITN/LLIN	Use insecticide spray	Use mosquito coils	Keep doors and windows closed	Use insect repellent	Keep surroundings clean	Cut the grass	Eliminate stagnant water around living area	Other	Don't know	Number of women
Age														
15-19	90.5	992	58.8	17.0	20.7	23.5	13.6	3.0	33.5	6.3	9.4	6.7	2.8	897
20-24	92.4	1,100	60.8	19.2	22.2	27.5	11.1	3.2	26.9	6.4	6.8	7.1	3.9	1,016
25-29	92.5	1,213	64.5	16.4	19.1	24.8	13.8	2.8	35.0	7.7	8.8	6.8	3.9	1,122
30-34	92.3	917	60.8	17.5	22.1	22.1	12.8	3.0	30.2	6.6	6.6	9.0	2.7	846
35-39	91.2	764	61.4	15.7	18.7	32.6	11.9	2.2	30.1	8.3	8.7	5.9	3.5	697
40-44	93.5	565	61.4	18.4	19.8	31.3	13.5	1.9	31.6	7.2	7.6	6.3	3.3	528
45-49	93.0	440	63.0	17.9	18.3	23.9	10.5	2.8	28.9	8.4	9.3	10.5	3.6	409
Residence														
Urban	94.1	1,772	59.7	20.5	30.0	22.3	15.6	3.1	40.1	4.9	11.1	6.9	3.0	1,668
Rural	91.2	4,219	62.3	16.1	16.2	27.9	11.3	2.6	27.2	8.1	6.8	7.5	3.6	3,847
Zone														
North Central	92.9	913	39.8	32.6	22.7	11.4	17.2	6.5	26.0	2.4	8.2	4.6	4.4	848
North East	92.3	882	90.2	1.0	28.2	65.4	27.8	2.4	25.4	0.1	0.4	0.4	0.9	814
North West	96.5	1,499	66.9	16.7	10.9	34.3	4.6	1.8	28.0	17.8	4.6	5.1	1.7	1,447
South East	92.7	678	54.1	27.0	21.4	12.0	9.7	2.6	34.4	4.0	14.1	11.9	5.6	629
South South	91.7	929	77.2	9.7	24.1	14.5	12.8	2.0	41.6	8.1	16.0	7.6	2.2	853
South West	84.9	1,089	38.4	19.6	22.0	13.1	9.4	1.9	33.9	2.2	9.0	15.8	7.0	925
Areas for LLIN malaria campaigns														
World Bank Booster[1]	92.7	1,386	75.4	21.5	17.9	26.0	6.9	1.8	33.2	21.7	3.6	3.7	1.8	1,285
Others with campaigns[2]	95.2	1,119	59.8	24.5	17.6	27.7	12.7	1.7	26.1	0.7	7.1	9.1	2.3	1,066
Others with no campaigns[3]	90.8	3,485	56.4	13.4	22.3	25.8	14.9	3.5	32.0	3.4	10.3	8.1	4.4	3,165
Education														
No education	92.0	2,457	64.3	15.6	11.5	36.8	10.6	1.7	19.6	8.2	2.3	5.7	3.4	2,261
Primary	88.7	1,019	57.6	14.7	19.5	21.6	12.3	3.2	29.6	5.9	9.2	8.8	4.9	904
Secondary	92.4	2,033	59.9	17.5	26.4	17.9	13.7	2.8	40.0	6.5	11.6	8.4	3.3	1,878
More than secondary	98.1	481	62.2	30.8	40.1	17.5	18.7	7.1	53.6	6.7	19.9	7.8	0.8	472
Wealth quintile														
Lowest	92.8	1,059	62.8	15.0	10.5	41.9	14.4	2.0	15.9	7.5	1.0	3.2	3.9	983
Second	90.2	1,057	66.3	14.9	15.3	33.9	11.5	2.4	21.2	7.2	5.1	6.3	2.9	954
Middle	90.0	1,187	63.7	13.0	15.1	25.8	10.7	2.7	28.9	6.8	6.3	9.3	3.7	1,068
Fourth	91.1	1,238	60.2	17.1	21.5	19.4	11.1	2.6	36.4	7.6	11.1	8.6	5.1	1,127
Highest	95.4	1,450	56.7	24.5	33.9	15.6	14.9	3.8	46.2	6.7	14.1	8.3	1.7	1,383
Total	92.1	5,991	61.5	17.4	20.3	26.2	12.6	2.8	31.1	7.1	8.1	7.3	3.4	5,515

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

When asked to cite specific ways to avoid getting malaria, 62 percent of women say sleeping under a mosquito net, while other responses include keeping the surroundings clean (31 percent), using mosquito coils (26 percent), using insecticide spray (20 percent), sleeping under an ITN or LLIN (17 percent), keeping the doors and windows closed (13 percent), eliminating stagnant water around living areas (8 percent), cutting the grass (7 percent), and using insect repellent (3 percent). The percentage of women who mention sleeping under a mosquito net as a way to avoid malaria varies greatly among zones, ranging from 38 percent in South West to 90 percent in North East. Seventy-five percent of women living in areas with the World Bank Booster campaign say that sleeping under a mosquito net is a way to avoid getting malaria, compared with 60 percent of women in other net campaign areas, and 56 percent of women in areas with no campaign.

Women who said there are ways to avoid getting malaria were also asked to cite specific ways for pregnant women to avoid getting malaria. Fifty-eight percent of women report that sleeping under a mosquito net helps pregnant women avoid getting malaria, while 28 percent say keeping the environment clean, 22 percent say taking SP/Fansidar as a part of antenatal care, 16 percent say sleeping under an ITN or LLIN, and 4 percent say taking daraprim tablets are ways for pregnant women to avoid getting malaria (Table 4.4). Women who live in areas with the World Bank Booster campaign are more likely than women who live in other areas to report that sleeping under a mosquito net (72 percent) and taking SP/Fansidar as a part of antenatal care (32 percent) are ways pregnant women can avoid getting malaria.

Table 4.4 Knowledge of ways pregnant women can prevent getting malaria

Among women age 15-49 who say there are ways to avoid getting malaria, the percentage who cite specific ways that pregnant women can prevent getting malaria, by background characteristics, Nigeria 2010

Background characteristic	Sleep under mosquito net	Sleep under ITN/LLIN	Keep environment clean	Take SP/ Fansidar given during antenatal care	Take daraprim tablets (Sunday-Sunday medicine)	Other	Don't know	Number of women
Age								
15-19	51.2	16.5	25.0	15.9	4.4	2.2	21.4	897
20-24	57.5	17.6	26.3	21.5	3.4	4.9	11.5	1,016
25-29	61.2	15.6	31.1	24.1	3.4	5.0	8.1	1,122
30-34	57.2	17.0	24.5	26.4	5.8	5.6	8.4	846
35-39	60.1	14.1	26.6	23.4	3.8	6.7	6.8	697
40-44	61.4	17.1	32.6	19.6	3.1	3.8	7.5	528
45-49	58.3	17.5	31.3	19.8	5.1	4.2	8.9	409
Residence								
Urban	54.3	19.1	36.9	24.2	4.4	4.8	9.9	1,668
Rural	59.5	15.3	23.8	20.7	4.0	4.6	11.2	3,847
Zone								
North Central	35.3	34.8	26.6	18.9	2.8	3.7	12.2	848
North East	93.7	0.6	37.5	4.6	1.3	0.8	2.6	814
North West	66.3	17.3	24.5	18.9	3.3	3.9	7.5	1,447
South East	45.6	20.3	22.9	40.4	10.7	5.2	15.0	629
South South	70.5	9.3	30.2	30.3	7.4	3.6	7.4	853
South West	30.9	16.2	26.7	23.6	1.4	10.7	22.1	925
Areas for LLIN malaria campaigns								
World Bank Booster[1]	71.9	20.9	28.4	31.6	2.3	1.5	5.5	1,285
Others with campaigns[2]	56.5	24.3	23.6	8.3	2.2	7.9	6.4	1,066
Others with no campaigns[3]	52.7	12.0	28.9	22.4	5.4	4.9	14.4	3,165
Education								
No education	64.9	16.0	21.9	12.4	2.3	4.2	8.7	2,261
Primary	52.9	13.8	27.2	25.9	4.6	5.7	9.9	904
Secondary	52.1	15.7	31.6	28.2	5.3	4.7	14.8	1,878
More than secondary	57.5	26.8	42.3	33.7	7.1	4.4	6.7	472
Wealth quintile								
Lowest	65.7	15.5	21.8	10.5	1.9	1.5	9.5	983
Second	64.4	14.9	23.2	15.4	2.3	4.0	10.0	954
Middle	59.9	13.1	24.2	22.3	3.9	6.3	10.5	1,068
Fourth	53.7	15.1	27.8	27.7	5.2	5.4	12.9	1,127
Highest	49.9	21.9	38.0	29.0	6.1	5.5	10.8	1,383
Total	57.9	16.4	27.8	21.8	4.1	4.7	10.8	5,515

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

4.1.4 Knowledge of Malaria Treatment

In the 2010 NMIS, women were asked if malaria can be treated. Women who reported that malaria was treatable were further asked to cite specific drugs that are used to treat adults with malaria and drugs that are used to treat children with malaria. Table 4.5 presents information on women's knowledge of malaria treatment for adults and children.

Overall, 98 percent of women report that malaria is treatable. Among these women, 38 percent report that chloroquine can be used to treat malaria in adults, and 38 percent also report that aspirin, Panadol, or paracetamol can be used to treat malaria in adults. Other answers regarding malaria medicines for adults include SP/Fansidar (23 percent), ACT (9 percent), and quinine (5 percent), while 23 percent of women who say that malaria can be treated say they do not know of any specific medicine.

As for malaria medicines for children, 44 percent of women say that malaria can be treated with aspirin, Panadol, or paracetamol, while 37 percent say chloroquine, 13 percent say SP/Fansidar, 12 percent say ACT, and 7 percent say quinine. Twenty-three percent of women report that they do not know which medicines can be used to treat malaria in children.

Knowledge of ACT as a drug that can be used to treat malaria is higher among urban than rural women and increases with education and wealth. It is also higher among women in South South than among women in other zones.

Table 4.5 Knowledge of malaria treatment in adults and children

Among all women age 15-49 who have ever heard of malaria, percentage who say malaria can be treated, and among those who say malaria can be treated, the percentage who cite specific medicines that can be given to children and adults, by background characteristics, Nigeria 2010

Background characteristic	Percentage who say malaria can be treated	Number of women	Among women who say malaria can be treated, percentage who cite specific medicines for adults							Among women who say malaria can be treated, percentage who cite specific medicines for children							
			SP/ Fansidar	Chloroquine	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	SP/ Fansidar	Chloroquine	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	Number of women
Age																	
15-19	96.5	992	18.7	37.9	4.5	7.2	39.0	5.7	26.9	10.1	32.6	5.4	6.8	44.6	6.7	30.9	957
20-24	98.3	1,100	24.7	33.6	3.9	9.1	36.6	7.1	23.1	14.1	34.2	5.5	10.6	44.0	4.8	25.3	1,082
25-29	98.6	1,213	26.7	38.8	5.3	11.1	37.7	7.4	19.7	15.5	39.0	7.1	13.8	45.7	5.9	18.8	1,195
30-34	97.0	917	24.4	37.2	7.0	11.2	33.8	7.6	24.2	13.3	37.0	9.0	14.1	43.1	6.4	21.2	889
35-39	98.4	764	24.6	40.4	4.9	9.1	40.1	7.5	20.1	15.4	39.6	7.0	12.1	46.6	6.4	18.7	752
40-44	97.8	565	22.4	43.0	4.2	8.0	42.7	7.7	20.3	11.2	42.7	4.7	11.9	46.9	6.5	19.5	553
45-49	96.2	440	18.4	42.1	6.3	7.8	35.8	9.5	23.3	12.4	40.1	5.7	12.4	36.8	9.5	22.6	423
Residence																	
Urban	98.5	1,772	35.6	47.0	5.7	15.0	37.1	3.9	13.4	19.2	44.0	7.6	16.0	45.6	4.1	17.3	1,745
Rural	97.3	4,219	18.2	34.6	4.8	6.9	38.0	8.7	26.4	10.9	34.4	6.0	9.8	43.9	7.2	25.0	4,106
Zone																	
North Central	97.3	913	11.9	31.4	0.9	7.3	42.6	8.3	26.6	5.8	33.4	2.1	6.6	47.5	7.8	27.3	888
North East	96.4	882	17.3	59.4	7.8	8.9	69.7	0.6	13.0	14.2	62.1	6.2	8.1	72.2	0.7	13.7	850
North West	98.4	1,499	20.6	29.1	0.8	3.4	27.4	2.7	41.3	14.4	31.5	1.0	12.6	29.1	2.3	35.6	1,475
South East	97.8	678	43.1	42.2	5.7	10.4	9.3	5.9	17.1	17.9	36.9	8.2	13.2	27.1	4.8	22.9	663
South South	97.8	929	34.8	46.0	14.3	19.8	34.7	10.1	11.7	18.1	35.9	21.4	19.6	47.1	7.2	13.4	909
South West	97.9	1,089	19.7	31.0	4.1	9.9	42.8	16.6	13.5	10.9	30.0	4.3	9.5	49.2	15.3	15.8	1,066
Areas for LLIN malaria campaigns																	
World Bank Booster[1]	97.0	1,386	32.6	30.8	5.4	11.7	18.2	3.7	30.3	17.1	27.5	10.6	22.7	27.0	3.0	27.8	1,345
Others with campaigns[2]	98.2	1,119	15.3	41.6	3.1	8.3	61.1	9.5	17.4	9.5	42.8	1.9	9.2	63.7	6.9	16.5	1,099
Others with no campaigns[3]	97.7	3,485	22.4	40.2	5.6	8.7	37.9	8.0	21.2	13.2	39.3	6.3	8.0	45.1	7.4	22.6	3,407
Education																	
No education	96.4	2,457	10.8	32.4	2.2	3.2	41.9	7.9	31.9	8.5	35.3	2.0	7.0	45.1	6.3	28.1	2,369
Primary	97.6	1,019	18.3	42.4	6.9	4.5	40.3	10.7	19.9	9.8	38.4	6.3	6.9	46.3	9.9	21.4	995
Secondary	98.8	2,033	33.7	42.4	7.4	13.0	33.9	5.8	16.4	17.7	38.4	10.8	14.2	44.2	5.4	19.4	2,008
More than secondary	99.6	481	53.2	41.6	6.1	34.3	28.0	3.1	7.6	27.1	39.4	10.8	33.7	37.8	2.7	12.5	479
Wealth quintile																	
Lowest	97.1	1,059	9.0	34.8	3.3	2.5	40.0	6.6	33.5	5.8	36.0	3.4	3.6	42.6	5.4	33.1	1,028
Second	96.5	1,057	12.3	34.1	3.3	4.1	45.5	8.3	32.1	10.1	34.4	2.7	7.1	47.4	7.5	29.2	1,020
Middle	97.1	1,187	16.9	35.2	4.2	5.4	40.9	9.3	24.9	10.2	35.4	4.1	9.3	48.8	8.4	20.9	1,152
Fourth	98.2	1,238	29.6	40.9	5.4	9.4	34.7	8.1	18.6	16.8	39.3	8.2	11.9	42.4	5.5	19.7	1,215
Highest	99.0	1,450	41.6	44.0	8.0	21.1	30.7	4.8	9.5	20.7	39.9	11.9	22.2	41.8	5.0	14.4	1,435
Total	97.7	5,991	23.4	38.3	5.1	9.3	37.8	7.3	22.6	13.4	37.2	6.5	11.6	44.4	6.3	22.7	5,851

ACT = artemesinin combination therapy
[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

4.2 EXPOSURE TO MALARIA PREVENTION MESSAGES

A crucial element in the fight to eliminate malaria is the ability to reach the population with information and educational materials. To assess the coverage of communication programmes, women interviewed in the NMIS were asked if they had seen or heard any messages about malaria prevention in the four weeks preceding the survey. Women who had heard or seen malaria prevention messages were then asked to cite specific messages.

Table 4.6 shows that 30 percent of women had heard or seen a malaria prevention message in the four weeks preceding the survey. Among these women, the most common malaria prevention message was the advertisement with the mosquito carrying or 'backing' the baby on its back, reported by 22 percent of women who had seen a malaria message. Sixteen percent of women who were exposed to a malaria message cited the 'Lonart versus malaria' message, while 14 percent saw the message in which a mosquito takes a child away while the family is sleeping, and 13 percent saw the message in which the king gets slapped. Smaller proportions of women were exposed to other messages.

Table 4.6 Exposure to malaria prevention messages

Among women age 15-49 who have ever heard of malaria, the percentage who have seen or heard any messages about malaria in the four weeks preceding the survey, and among those, the percentage who cite specific messages they saw or heard, by background characteristics, Nigeria 2010

Background characteristic	Percentage who have seen or heard messages about malaria in the last 4 weeks	Number of women	Among women who have seen or heard any messages about malaria, percentage who cite messages: Mosquito backing baby	Man playing drafts with mosquito	Mosquito appears in family picture	Woman wearing mosquito net as clothes going to market (billboard)	Friends playing drafts, small friend slaps big friend (Mr. Calypso)	Mosquito takes child away while family is sleeping	Woman wearing mosquito net as clothes going to market (tele-vision)	Woman tells husband[1]	The king gets slapped	Lonart versus malaria	Other	Don't know	Number of women
Age															
15-19	25.9	992	24.3	7.5	5.0	1.9	11.0	10.9	1.5	4.0	12.0	17.2	4.8	12.7	257
20-24	31.8	1,100	22.5	6.6	7.2	2.8	6.0	14.5	2.0	2.9	15.5	14.6	5.0	13.0	349
25-29	29.7	1,213	23.5	9.4	6.2	2.6	9.2	14.8	2.0	4.2	13.8	18.5	3.4	10.8	360
30-34	28.9	917	21.8	3.4	6.8	3.3	7.1	12.5	3.0	2.6	12.6	16.3	6.8	15.7	265
35-39	28.8	764	17.3	6.1	7.5	3.7	4.9	13.1	1.5	2.1	10.5	19.1	4.3	14.8	220
40-44	30.9	565	25.5	5.4	7.1	2.9	8.9	18.7	1.7	1.7	10.7	11.3	6.2	10.5	174
45-49	34.7	440	18.4	6.6	4.9	4.3	7.2	10.0	6.7	0.7	12.9	13.6	6.6	21.7	152
Residence															
Urban	38.2	1,772	21.7	10.2	8.6	3.2	14.5	15.2	3.2	4.2	23.0	27.4	4.1	5.0	678
Rural	26.1	4,219	22.4	4.4	5.2	2.8	3.7	12.6	1.9	2.0	6.7	9.3	5.7	18.9	1,102
Zone															
North Central	16.7	913	32.2	7.2	0.5	1.3	3.3	9.6	6.5	3.7	27.7	32.5	4.9	8.0	152
North East	12.1	882	7.6	5.6	4.6	3.8	5.9	8.1	2.0	1.6	1.7	1.4	1.2	16.5	106
North West	40.3	1,499	38.1	3.6	13.6	2.4	3.5	30.3	1.8	0.9	3.2	0.1	3.6	24.1	605
South East	33.0	678	12.6	12.0	5.0	10.8	16.3	4.3	2.5	9.2	28.5	9.2	3.9	7.9	224
South South	36.0	929	14.7	11.8	1.6	1.8	5.6	2.5	3.0	1.4	3.3	36.1	5.9	1.7	334
South West	32.9	1,089	8.2	3.6	2.9	0.5	14.2	4.9	1.1	3.6	25.5	26.5	8.7	12.1	358
Areas for LLIN malaria campaigns															
World Bank Booster[2]	47.7	1,386	38.4	9.2	12.8	4.0	6.9	28.1	2.0	2.8	6.0	7.5	1.3	22.5	661
Others with campaigns[3]	21.5	1,119	13.9	3.3	3.5	0.5	2.6	3.8	0.6	2.6	18.3	11.3	4.4	4.0	240
Others with no campaigns[4]	25.2	3,485	12.2	5.6	2.5	2.8	9.9	5.3	3.2	3.0	16.6	24.0	8.1	9.6	878
Education															
No education	23.4	2,457	25.4	1.7	6.9	2.4	1.0	19.7	1.2	0.6	3.1	1.1	4.3	25.2	576
Primary	23.9	1,019	19.7	4.4	4.8	1.4	4.1	8.1	2.9	4.8	8.2	15.6	11.1	9.8	243
Secondary	34.0	2,033	20.4	8.7	7.0	3.8	11.9	11.2	3.0	3.7	16.5	23.7	4.3	8.8	692
More than secondary	55.8	481	21.8	13.8	5.7	3.2	15.1	11.9	3.0	3.7	28.9	29.6	3.2	4.7	268
Wealth quintile															
Lowest	15.8	1,059	22.3	0.6	5.5	1.6	0.0	21.2	1.7	1.0	1.8	1.3	4.9	33.7	168
Second	21.3	1,057	28.4	1.1	7.4	1.6	1.5	18.6	0.5	1.1	4.3	2.6	7.1	23.0	225
Middle	27.3	1,187	19.8	2.7	5.5	1.4	1.3	10.8	1.5	3.3	3.6	6.0	5.9	18.4	324
Fourth	29.1	1,238	25.9	8.6	8.0	5.2	6.0	12.3	1.6	3.6	13.1	12.6	6.0	13.3	360
Highest	48.4	1,450	19.2	10.6	6.0	3.3	15.6	12.2	4.0	3.3	22.5	30.6	3.6	3.8	702
Total	29.7	5,991	22.1	6.6	6.5	2.9	7.8	13.6	2.4	2.9	12.9	16.2	5.1	13.6	1,779

[1] Refers to the message in which a woman tells her husband: 'You don become doctor and you sabi belle pass me… I pity malaria'.
[2] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Women who reported hearing or seeing malaria prevention messages in the four weeks preceding the survey were asked to cite the specific place where they were exposed to these messages. The majority of women reported hearing the messages on the radio (63 percent), while 39 percent reported seeing them on television. Fifteen percent of women said they were exposed to messages by a relative, friend, or neighbour or while at school. Seven percent said they had seen messages on billboards.

Table 4.7 Source of exposure to malaria prevention messages

Among women age 15-49 who have seen or heard any messages about malaria in the four weeks preceding the survey, the percentage who cite specific sources of malaria messages, by background characteristics, Nigeria 2010

	Among women who have heard or seen any messages about malaria, percentage who cite specific sources														
Background characteristic	Radio	Tele-vision	Com-munity health exten-sion worker	Com-munity oriented re-source person	Role model care-giver/ com-munity worker	Mosque/ church	Town an-nouncer	Com-munity event	Bill-board	Poster	T-shirt	Leaflet/ fact sheet/ bro-chure	Relative/ friend/ neigh-bour/ school	Other	Number of women
Age															
15-19	54.1	44.3	1.1	0.0	1.0	0.0	3.3	1.0	9.6	4.4	1.5	0.4	12.3	1.7	257
20-24	61.1	40.5	4.3	0.0	1.1	0.0	8.2	0.4	6.9	4.2	1.5	1.3	17.1	0.4	349
25-29	60.4	41.0	6.1	0.6	1.4	0.4	6.6	0.7	7.4	4.2	1.2	0.2	18.8	0.2	360
30-34	64.6	36.9	3.4	0.4	3.5	0.0	5.3	0.5	6.5	4.4	2.6	0.5	13.3	0.5	265
35-39	69.6	33.2	2.3	0.0	1.1	0.0	6.3	0.0	4.0	4.2	1.0	1.4	14.5	0.0	220
40-44	71.4	32.6	2.3	0.6	0.0	0.9	5.6	1.3	8.9	2.0	3.5	0.9	15.2	0.8	174
45-49	68.6	37.4	1.0	0.0	0.7	1.0	6.8	0.0	7.7	3.6	3.3	0.0	11.6	2.2	152
Residence															
Urban	45.4	67.9	2.2	0.2	0.4	0.2	4.6	0.4	13.0	3.1	3.0	1.1	11.6	1.3	678
Rural	74.1	20.7	4.0	0.3	1.9	0.3	7.0	0.7	3.7	4.6	1.2	0.5	17.4	0.4	1,102
Zone															
North Central	47.5	58.3	2.9	0.0	0.5	1.0	1.2	0.1	25.9	1.9	0.5	0.5	4.3	0.4	152
North East	81.9	16.6	3.9	2.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106
North West	89.2	20.6	4.7	0.0	2.3	0.3	15.9	1.2	1.0	1.6	0.0	0.0	36.8	1.5	605
South East	72.3	49.3	0.8	0.9	0.2	0.0	0.1	0.0	11.0	4.9	9.9	2.1	0.6	0.0	224
South South	33.6	48.0	2.6	0.0	2.5	0.0	0.4	0.0	9.5	14.0	2.5	0.0	2.0	0.8	334
South West	42.1	52.1	3.4	0.0	0.3	0.4	2.5	0.6	7.5	0.2	0.6	2.0	9.4	0.0	358
Areas for LLIN malaria campaigns															
World Bank Booster[1]	78.1	31.0	5.1	0.5	2.9	0.2	14.6	1.1	4.4	5.8	4.0	0.2	32.8	1.3	661
Others with campaigns[2]	65.4	31.6	3.8	0.0	0.3	0.0	0.4	0.0	11.3	1.7	0.0	0.0	2.4	0.3	240
Others with no campaigns[3]	51.3	46.3	1.9	0.1	0.5	0.3	1.3	0.3	8.3	3.2	0.8	1.3	5.5	0.4	878
Education															
No education	88.4	10.6	3.5	0.4	2.3	0.5	11.0	1.3	1.3	0.7	0.3	0.0	25.2	0.7	576
Primary	66.1	25.3	6.0	0.0	0.4	0.0	3.2	0.0	4.9	4.9	1.3	1.3	11.1	0.2	243
Secondary	49.6	54.9	2.1	0.3	1.3	0.1	4.5	0.0	8.7	5.1	2.2	0.9	10.6	0.8	692
More than secondary	41.3	69.1	3.6	0.0	0.4	0.3	2.3	0.9	18.2	7.2	5.1	1.2	9.3	0.8	268
Wealth quintile															
Lowest	92.1	1.6	6.1	1.3	1.6	0.0	12.5	2.1	2.5	2.2	0.0	0.0	27.0	0.0	168
Second	87.6	8.0	4.7	0.0	3.5	0.7	8.1	1.1	0.8	3.1	0.0	0.4	22.0	0.5	225
Middle	79.0	12.5	3.8	0.0	1.0	0.0	6.6	0.0	3.7	5.1	0.7	0.0	15.1	0.4	324
Fourth	68.3	36.4	2.0	0.0	2.0	0.4	8.0	0.4	6.0	5.3	2.2	1.0	14.5	1.0	360
Highest	38.5	70.6	2.8	0.3	0.4	0.2	2.7	0.3	12.7	3.5	3.3	1.2	10.6	0.9	702
Total	63.2	38.7	3.3	0.2	1.4	0.3	6.1	0.6	7.2	4.0	1.9	0.7	15.2	0.7	1,779

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

4.3 MANAGEMENT OF FEVER AMONG CHILDREN

Most fevers occur at home, and they can rapidly progress to severe illness if treatment is not received promptly. In the 2010 NMIS, women with children under age 5 were asked if any of these children had had a fever in the two weeks preceding the survey and, if so, whether any treatment was sought for the fever. Questions were also asked about blood testing, the types of drugs given to the child, and how soon and for how long the drugs were taken.

Table 4.8 shows that 35 percent of children had a fever in the two weeks preceding the survey. Of these children, only 5 percent had a blood sample taken from a finger or heel for testing, presumably for a malaria test. Half (49 percent) of the children took antimalarial drugs, though only one quarter of the children (26 percent) took the antimarial drugs the same day or next day after the fever started.

Prevalence of fever is highest among children age 12-23 months and lowest among infants under 1 year. Prevalence is higher in rural than in urban areas and in the North West zone, where half of children under 5 were reported to have had a fever in the two weeks before the survey. Treatment with antimalarial drugs is more likely in urban areas than in rural areas. It is also more common among children whose mothers have more than a secondary education.

The proportion of children under age 5 who had a fever in the two weeks before the survey is higher in the 2010 NMIS (35 percent) than in the 2008 Nigeria Demographic and Health Survey (NDHS) when 16 percent had a fever. Part of the difference could be due to variation in the months of data collection[1], while part could be due to random variations from year-to-year in rainfall and mosquito transmission. It is noteworthy that the proportion of children with fever who were treated with antimalarial medicines also increased between the two surveys, from 33 percent in 2008 to 49 percent in 2010.

Table 4.8 Prevalence, diagnosis, and prompt treatment of children with fever

Percentage of children under age 5 with fever in the two weeks preceding the survey, and among children under age 5 with fever, the percentage who had blood taken from a finger or heel, the percentage who took antimalarial drugs, and the percentage who took the drugs the same or next day following the onset of fever, by background characteristics, Nigeria, 2010

	Among children under age 5:		Among children under age 5 with fever:			
Background characteristic	Percentage with fever in the two weeks preceding the survey	Number of children	Percentage who had blood taken from a finger or heel for testing	Percentage who took antimalarial drugs	Percentage who took antimalarial drugs same or next day	Number of children
Age (in months)						
<12	28.6	1,107	5.7	43.7	24.2	317
12-23	43.2	1,075	8.1	49.9	25.6	465
24-35	38.6	1,021	3.5	48.8	25.3	394
36-47	33.7	1,116	6.5	53.8	31.1	376
48-59	33.7	1,200	3.1	48.6	23.8	404
Sex						
Male	35.4	2,802	4.9	49.5	25.6	992
Female	35.5	2,717	6.0	48.7	26.4	964
Residence						
Urban	30.8	1,285	5.4	60.1	30.7	396
Rural	36.8	4,234	5.5	46.4	24.8	1,560
Zone						
North Central	17.6	850	9.1	39.7	17.8	149
North East	33.2	880	3.5	56.0	13.8	292
North West	49.3	1,777	4.7	54.3	33.3	875
South East	36.5	446	6.8	37.3	16.0	163
South South	38.5	759	5.7	48.5	28.5	292
South West	22.9	807	7.4	33.3	22.3	185
Mother's education						
No education	38.8	2,876	3.6	50.6	24.8	1,115
Primary	33.7	1,051	7.4	40.5	21.9	354
Secondary	30.4	1,350	7.7	50.1	30.7	410
More than secondary	31.8	242	11.7	63.7	38.3	77
Wealth quintile						
Lowest	36.5	1,172	4.4	42.6	19.2	428
Second	35.2	1,187	3.3	55.6	31.4	418
Middle	39.6	1,180	4.8	39.1	16.6	467
Fourth	37.3	1,015	8.5	54.6	29.7	379
Highest	27.5	965	7.2	59.4	39.9	265
Total	35.4	5,519	5.4	49.1	26.0	1,956

[1] The NMIS data collection took place from October-December 2010, while the NDHS took place from June-October 2008.

Details on the types and timing of antimalarial drugs given to children to treat fever are provided in Table 4.9. Twenty-nine percent of children under age 5 who had a fever in the two weeks preceding the survey took chloroquine, 11 percent took SP/Fansidar, and 6 percent took ACT.

There was a lag between the onset of fever and initiation of antimalarial drug therapy with children. Generally, only about half of children who were given a particular antimalarial medicine took it on the same day or the next day after getting the fever. Among children who took chloroquine, 15 percent took it the same or next day. Among children taking SP/Fansidar, 6 percent took it the same or next day. For children who took ACT, 3 percent took it the same or next day.

Table 4.9 Type and timing of antimalarial drugs taken by children with fever

Among children under age 5 with fever in the two weeks preceding the survey, the percentage who took specific antimalarial drugs and the percentage who took each type of drug the same or next day after developing fever, by background characteristics, Nigeria, 2010

	Percentage of children who took drug:						Percentage of children who took drug the same or next day:						Number of children with fever
Background characteristic	SP/ Fansidar	Chloro-quine	Amodia-quine	Quinine	ACT	Other anti-malarial	SP/ Fansidar	Chloro-quine	Amodia-quine	Quinine	ACT	Other anti-malarial	
Age (in months)													
<12	9.4	21.6	1.0	1.3	6.1	6.4	6.5	10.4	0.0	0.6	2.9	4.0	317
12-23	10.7	30.0	1.1	2.0	5.2	4.0	5.9	15.3	0.3	1.3	2.9	1.5	465
24-35	10.3	29.1	0.6	0.7	6.1	5.1	5.8	15.6	0.2	0.4	2.9	2.2	394
36-47	10.5	34.9	2.3	1.3	6.4	2.5	5.3	20.3	1.0	0.0	4.2	1.6	376
48-59	13.1	25.7	1.5	1.3	5.9	4.5	5.8	12.3	0.6	0.2	3.4	1.8	404
Sex													
Male	11.2	27.4	0.6	2.0	6.9	4.7	5.9	13.8	0.3	0.9	3.9	2.1	992
Female	10.5	29.6	2.0	0.7	4.9	4.1	5.8	16.0	0.6	0.2	2.5	2.2	964
Residence													
Urban	12.4	30.5	0.6	0.9	12.5	5.1	4.8	15.6	0.0	0.6	7.8	1.9	396
Rural	10.4	28.0	1.5	1.5	4.2	4.2	6.1	14.7	0.5	0.5	2.1	2.2	1,560
Zone													
North Central	11.6	23.6	0.7	0.5	0.2	4.9	3.2	12.4	0.0	0.0	0.0	2.8	149
North East	4.9	44.9	0.8	0.7	4.1	1.2	1.3	11.1	0.6	0.0	0.0	0.9	292
North West	15.2	32.2	2.3	0.3	4.8	4.2	9.7	20.3	0.7	0.3	2.7	1.5	875
South East	7.6	12.0	0.0	1.6	7.1	9.3	1.7	3.6	0.0	0.6	3.7	6.7	163
South South	10.1	18.9	0.5	6.4	11.5	6.3	4.6	11.8	0.0	2.5	7.5	3.2	292
South West	3.1	18.5	0.4	0.0	8.9	2.9	2.7	12.1	0.4	0.0	6.5	0.6	185
Mother's education													
No education	11.2	33.6	1.7	0.3	3.3	3.3	6.2	16.1	0.4	0.2	1.3	1.2	1,115
Primary	7.9	24.5	0.4	2.4	5.4	3.2	4.1	14.5	0.4	0.9	2.1	1.6	354
Secondary	10.4	19.6	1.3	2.5	11.1	7.7	5.5	12.3	0.5	1.4	7.6	4.1	410
More than secondary	21.5	19.6	0.0	4.7	18.2	9.8	10.9	12.5	0.0	0.0	13.0	7.4	77
Wealth quintile													
Lowest	6.9	32.7	0.9	0.2	2.6	2.0	3.7	15.5	0.0	0.2	0.0	0.5	428
Second	13.4	34.4	2.5	0.9	4.5	3.7	7.7	19.5	0.9	0.7	2.1	1.1	418
Middle	7.7	26.3	1.2	1.0	1.9	3.2	3.8	11.5	0.3	0.1	0.7	1.1	467
Fourth	13.5	25.1	1.1	1.4	10.2	5.6	5.8	14.1	0.8	0.5	6.5	3.1	379
Highest	15.1	21.0	0.6	4.5	14.3	9.9	10.0	13.5	0.0	1.7	10.0	6.7	265
Total	10.9	28.5	1.3	1.3	5.9	4.4	5.8	14.9	0.4	0.5	3.2	2.1	1,956

ACT = Artemisinin combination therapy

4.4 TREATMENT OF FEVER AMONG HOUSEHOLD MEMBERS

In the 2010 NMIS, information was collected about recent fever among all household members. Specifically, for each person listed in the household schedule, the interviewer asked if the person had had a fever in the two weeks preceding the survey and if so, whether the person got treatment for the fever, and if so, where and how much the treatment cost. In interpreting the answers to these questions, it is very important to remember that the information was provided by the respondent to the household interview and not necessarily by the household member who had a recent fever. Although some household interviews are done with several members together, in many cases, the data on fever prevalence, treatment, and cost are proxy reports.

Table 4.10 presents data on the percentage of household members with fever in the two weeks preceding the survey, the percentage who got treatment, information on the first place of treatment, and cost of treatment, by background characteristics. One-quarter of household members were reported to have had a fever in the two weeks preceding the survey. Prevalence is considerably higher among children under age 5 than among older household members. Fever is more common among people in North West than among those in other zones, and least common in North Central.

Ninety-one percent of household members who had a fever got treatment. The majority of people got treatment at a chemist/PMV (57 percent), while one-quarter got treatment at a government hospital, health centre, or clinic (26 percent). The average cost of treatment was 950 Naira.

Table 4.10 Fever and treatment of fever among household members

Percentage of household members reported to have had fever in the two weeks preceding the survey, and among household members with fever, the percentage who received treatment, the first place of treatment, and the average cost of treatment, by background characteristics, Nigeria 2010

Background characteristic	Percentage with fever in the two weeks preceding the survey	Number	Among those with fever, percentage who received treatment	Among those with fever, first place of treatment: Government hospital, health centre, clinic	Private hospital, clinic, doctor	Mobile clinic	Chemist, PMV	Shop, drug hawker	Role model caregiver, community worker	Traditional practitioner	Self treatment at home	Don't know/ missing	Average cost of treatment (in Naira)	Number with fever
Sex														
Male	24.6	15,150	91.5	24.5	6.2	0.6	57.7	5.2	0.1	1.3	3.2	1.1	1,019.5	3,406
Female	25.4	15,236	90.2	26.5	5.4	0.7	57.0	5.3	0.1	0.8	2.7	1.4	881.7	3,496
Age														
<5	35.5	6,207	90.4	31.8	5.1	0.4	55.5	2.6	0.1	0.3	2.5	1.6	871.7	1,991
5-9	26.6	4,691	93.8	24.3	3.4	0.6	61.4	5.8	0.0	0.6	2.7	1.2	683.4	1,170
10-14	19.3	3,638	92.3	22.6	3.8	0.4	62.9	6.8	0.1	0.4	2.4	0.6	700.6	650
15-19	17.7	2,505	87.5	22.1	6.7	1.0	56.1	8.4	0.3	1.4	3.0	1.0	760.3	388
20-24	20.5	2,139	91.4	27.0	8.3	0.4	56.1	4.8	0.0	0.2	2.3	0.9	1,112.4	400
25-29	19.5	2,187	92.0	25.4	5.3	0.8	57.6	5.4	0.3	1.0	2.9	1.3	1,049.6	392
30-34	20.9	1,816	90.0	23.9	7.7	0.7	53.8	7.3	0.7	0.8	4.0	1.3	1,179.7	341
35-39	21.7	1,559	87.9	21.6	8.0	1.0	58.2	6.7	0.0	1.2	2.9	0.5	1,182.5	297
40-44	23.5	1,205	89.7	25.6	3.8	0.6	56.5	6.8	0.0	2.1	2.0	2.5	901.9	254
45-49	22.4	1,007	92.8	24.1	5.3	1.5	59.3	5.7	0.5	1.7	1.6	0.4	1,204.6	209
50-54	26.9	1,019	90.9	17.5	5.5	1.2	57.0	6.2	0.0	4.8	7.0	0.8	1,058.7	249
55-59	22.5	590	84.2	16.3	10.0	1.5	57.3	10.6	0.0	0.0	3.7	0.7	1,388.3	112
60+	25.5	635	89.3	15.2	8.6	1.0	60.3	3.1	0.0	2.3	7.6	2.0	926.6	145
Residence														
Urban	22.7	8,097	92.8	21.6	8.6	0.3	59.0	5.2	0.1	0.5	3.8	1.0	1,033.2	1,702
Rural	25.9	22,290	90.2	26.8	4.9	0.8	56.8	5.3	0.2	1.2	2.7	1.3	922.3	5,201
Zone														
North Central	10.8	5,017	92.3	21.8	19.5	0.4	41.6	3.1	0.0	2.2	10.5	1.0	1,113.5	502
North East	28.1	4,812	89.5	22.6	0.8	1.8	62.2	10.8	0.1	0.1	1.4	0.2	842.0	1,212
North West	34.5	7,956	89.2	41.6	0.5	0.0	50.0	4.5	0.0	0.0	1.6	1.8	749.0	2,450
South East	20.4	3,095	89.4	6.8	11.5	0.5	76.2	0.5	1.1	1.0	1.3	1.0	1,094.3	564
South South	27.8	4,264	94.9	14.6	4.9	1.4	72.9	0.9	0.0	1.4	2.9	0.8	1,310.5	1,124
South West	21.7	5,243	92.2	14.9	15.3	0.3	49.7	9.2	0.1	3.5	5.2	1.8	999.6	1,050
Areas for LLIN malaria campaigns														
World Bank Booster[1]	25.1	6,857	85.7	31.6	2.9	0.0	58.1	3.7	0.0	0.6	2.6	0.5	989.7	1,475
Others with campaigns[2]	18.0	5,530	91.7	27.3	3.2	0.7	58.6	3.2	0.0	0.3	3.9	2.8	896.7	911
Others with no campaigns[3]	27.1	18,000	92.5	23.1	7.3	0.9	56.9	6.2	0.2	1.3	2.9	1.2	947.1	4,516
Wealth quintile														
Lowest	26.8	6,109	86.7	30.3	1.4	1.6	50.8	12.6	0.0	0.3	2.4	0.6	812.9	1,417
Second	24.9	6,045	89.1	27.1	2.2	1.1	57.1	5.9	0.1	1.2	3.9	1.3	870.2	1,340
Middle	25.9	6,074	90.8	28.2	4.9	0.2	56.6	3.4	0.2	1.5	2.2	2.8	873.4	1,426
Fourth	26.3	6,078	93.1	21.4	7.8	0.2	64.5	2.7	0.2	0.7	1.7	0.8	958.4	1,488
Highest	21.2	6,081	95.4	20.2	13.4	0.1	57.4	1.5	0.2	1.5	4.9	0.7	1,271.0	1,232
Total	25.0	30,387	90.8	25.5	5.8	0.7	57.4	5.3	0.1	1.0	3.0	1.3	949.6	6,903

PMV = Patent medicine vendor
Note: Total includes 6 people with age missing. Average cost of treatment includes those who received free care.
[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

MALARIA PREVENTION 5

5.1 MOSQUITO NETS

5.1.1 Background

Use of insecticide-treated nets (ITNs) is one of the most effective measures used to prevent malaria. Between May 2009 and February 2011, the government of Nigeria, with support from several partners, distributed approximately 30 million mosquito nets across the country. In addition, awareness of the importance of net usage has increased, leading to a greater demand for the nets, both treated and untreated. The Federal Ministry of Health (FMoH) plans to distribute an additional 30 million nets across the country by the end of 2011 to achieve universal net coverage, which is defined as one net for every two people (FMoH, 2008b; NMCP, 2011).

5.1.2 Ownership of Mosquito Nets

The 2010 NMIS included questions on bed net ownership and use, type of net and source, and reasons for not using a net, if applicable. In addition, questions were asked to determine who had slept under each net the previous night and, if no one had, the reasons why the net was not used.

Table 5.1 presents information on the percentage of households that have any type of mosquito net, an insecticide-treated net (ITN), and a long-lasting insecticidal net (LLIN), by residence, zone, area for LLIN malaria campaigns, and wealth quintile.

Overall, 44 percent of households have at least one mosquito net, 42 percent have at least one ITN, and 41 percent have at least one LLIN. This implies that almost all ITNs owned by households in Nigeria are LLINs. Figure 5.1 shows that, compared with 2003 and 2008 NDHS surveys, when only 2 and 8 percent, respectively, owned at least one ITN, ownership of mosquito nets has increased quite substantially to the current level of 42 percent (NPC and ORC Macro, 2004; NPC and ICF Macro, 2009). This sharp increase in net ownership by households can be attributed to the LLIN mass distribution campaign supported by the Global Fund, the World Bank, DFID, Support for the National Malaria Control Programme (SuNMaP), and the MDG funds through the government of Nigeria.

Ownership of at least one ITN varies widely by background characteristics. It is notably higher among rural households (45 percent) than among urban households (33 percent). Among zones, it ranges from 20 percent of households in South West to 63 percent of households in North East (Figure 5.2). As expected, the households in LLIN World Bank Booster areas (72 percent) and in other LLIN campaigns (75 percent) are much more likely to own at least one ITN than households in areas where there are no LLIN campaigns (22 percent). Half of the households in the lowest wealth quintile (49 percent) own at least one ITN compared with only one-third of the households in the highest wealth quintile (34 percent).

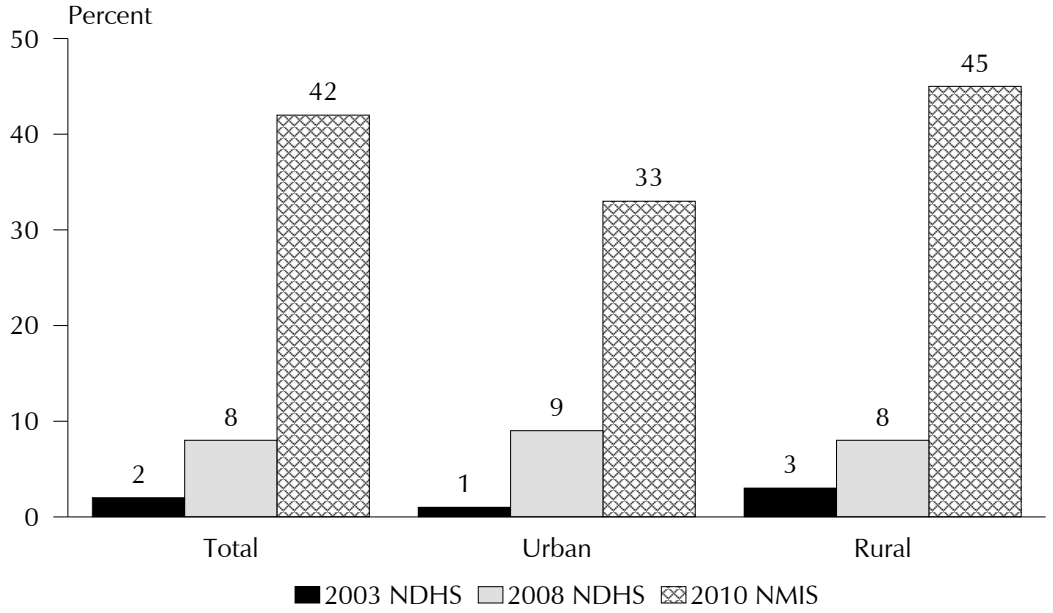
Table 5.1 Household possession of mosquito nets

Percentage of households with at least one and more than one mosquito net (treated or untreated), insecticide treated net (ITN), and long-lasting insecticidal net (LLIN), and the average number of nets per household, by background characteristics, Nigeria 2010

Background characteristic	Any type of mosquito net			Insecticide treated mosquito nets (ITN)[1]			Long-lasting insecticidal net (LLIN)[2]			Number of households
	Percentage with at least one	Percentage with more than one	Average number of nets per household	Percentage with at least one	Percentage with more than one	Average number of ITNs per household	Percentage with at least one	Percentage with more than one	Average number of LLINs per household	
Residence										
Urban	35.6	19.8	0.6	33.1	18.5	0.6	32.9	18.4	0.6	1,720
Rural	47.3	29.5	0.9	45.0	27.9	0.9	44.8	27.7	0.9	4,175
Zone										
North Central	32.7	16.7	0.6	32.1	16.2	0.6	32.1	16.2	0.6	951
North East	67.4	47.9	1.5	62.9	43.7	1.4	61.8	43.1	1.4	858
North West	59.7	39.3	1.2	58.2	38.0	1.1	58.2	38.0	1.1	1,296
South East	35.0	21.3	0.6	32.2	20.1	0.6	32.1	19.9	0.6	678
South South	45.2	21.7	0.8	43.8	21.1	0.7	43.5	21.1	0.7	859
South West	23.7	13.0	0.4	20.3	11.3	0.4	20.2	11.3	0.4	1,253
Areas for LLIN malaria campaigns										
World Bank Booster[3]	75.1	50.2	1.5	71.7	47.3	1.4	70.9	46.8	1.4	1,244
Others with campaigns[4]	76.8	57.3	1.6	75.4	55.3	1.6	75.4	55.3	1.6	981
Others with no campaigns[5]	24.4	10.6	0.4	22.3	9.5	0.4	22.1	9.5	0.4	3,670
Wealth quintile										
Lowest	52.4	33.7	1.1	49.3	31.1	1.0	48.7	30.8	1.0	1,116
Second	45.0	28.8	0.9	44.2	28.0	0.9	44.0	27.8	0.9	1,136
Middle	49.3	34.1	1.0	46.3	32.0	0.9	46.2	32.0	0.9	1,128
Fourth	38.7	20.8	0.7	36.1	19.6	0.7	36.0	19.6	0.7	1,182
Highest	35.7	17.9	0.6	33.6	16.7	0.6	33.3	16.6	0.6	1,334
Total	43.9	26.7	0.9	41.5	25.1	0.8	41.3	25.0	0.8	5,895

[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a pretreated net obtained within the past 12 months or (3) a net that has been soaked with insecticide within the past 12 months.
[2] A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.
[3] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[4] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[5] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

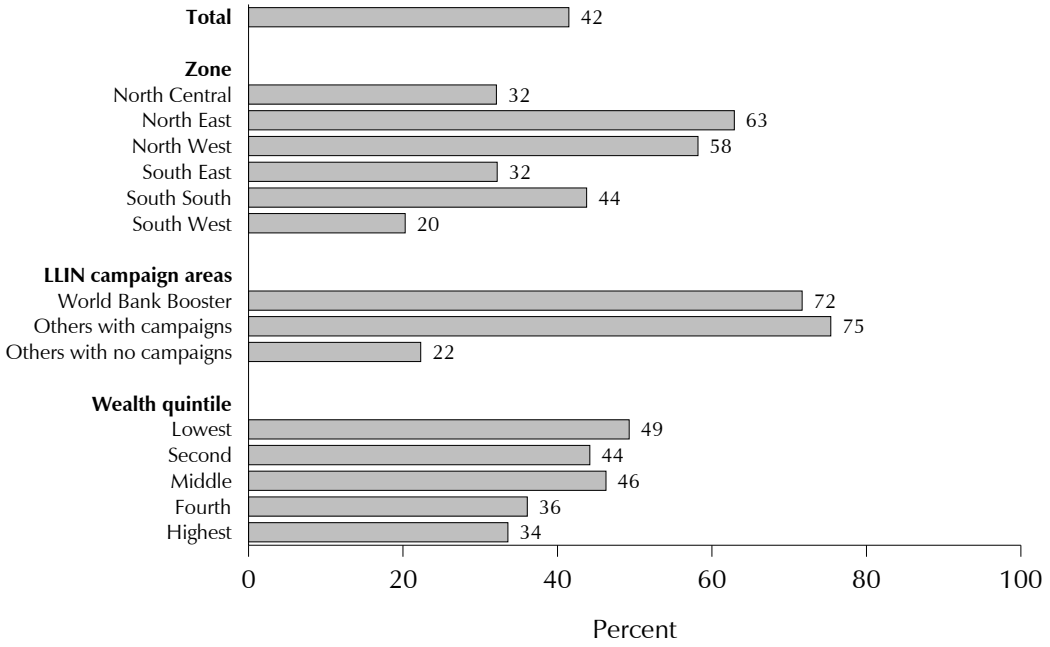
Figure 5.1 Trends in Ownership of ITNs: Percent of Households with at Least One ITN



Nigeria 2010

Survey findings also show that the average number of any nets, ITNs, and LLINs is just under one per household. There are no major variations in the average number of nets per household by background characteristics. However, households in the South West zone, those in areas with no LLIN campaigns, and those in the highest wealth quintile have the lowest average number of nets per household.

Figure 5.2 Differentials in the Household Ownership of ITNs



Nigeria 2010

There are several ways to procure or obtain a mosquito net in Nigeria. A pregnant woman may receive a mosquito net during a routine antenatal care visit. Parents of children under age 5 may receive a net during a routine immunization visit to a health facility. Mosquito nets can also be obtained during mass distribution campaigns, and they can be purchased directly through various avenues. The percent distribution of nets by source, according to background characteristics, is shown in Table 5.2.

Mass net distribution campaigns are the main distribution channel for mosquito nets (56 percent). Other major sources of nets in Nigeria are open markets (19 percent) and primary health centers or health posts (17 percent). At the zonal level, considerable variation exists in source of nets. Only one-quarter of nets in South South are obtained through a net distribution campaign compared with more than seven in ten (71 percent) nets in North West. A primary health centre or health post is the primary source of nets for households in South South (64 percent) – but a source for only 7 percent of nets in North East. The open market is a more significant source of nets in North East (42 percent) than in any other zone. As expected, nets in the World Bank Booster areas (67 percent) and in the areas with other LLIN campaigns (80 percent) are substantially more likely than those in areas with no LLIN campaigns (15 percent) to be obtained from net distribution campaigns. The main sources for nets in areas with no LLIN campaigns are the open market (46 percent) followed by primary health centres or health posts (22 percent).

Table 5.2 Source and cost of mosquito nets

Percent distribution of nets by the type of place where net was obtained, the percentage of nets obtained for free, and average cost of nets, by background characteristics, Nigeria 2010

Background characteristic	Place net was obtained																
	Net distribution campaign	Primary health centre/ health post	Government hospital	Private hospital	NGO/ mission clinic	Mosque/ church	Pharmacy	Patent medicine store	Shop/ supermarket	Open market	Hawker	Other	Don't know/ Missing	Total	Percentage of free nets	Average cost of net[1]	Number of nets
Residence																	
Urban	50.9	17.7	4.1	0.5	0.6	0.4	0.5	0.6	0.6	20.5	1.2	0.2	2.0	100.0	72.5	165.2	1,105
Rural	57.3	16.9	1.9	0.1	0.2	0.1	0.1	0.1	0.8	18.3	1.2	0.4	2.6	100.0	76.4	124.2	3,918
Region																	
North Central	67.4	11.0	3.6	0.3	0.7	0.3	0.2	0.1	0.8	13.9	0.4	0.1	1.2	100.0	82.5	128.7	549
North East	45.1	7.3	0.6	0.1	0.0	0.0	0.0	0.0	0.8	42.2	2.6	0.1	1.2	100.0	52.9	251.6	1,307
North West	70.6	7.9	2.6	0.1	0.0	0.2	0.0	0.0	0.8	13.4	0.7	0.1	3.6	100.0	81.3	77.4	1,539
South East	63.2	19.4	2.0	0.5	1.2	0.7	0.6	1.0	1.0	6.9	0.7	2.1	0.5	100.0	85.1	100.0	439
South South	24.5	63.9	3.6	0.2	0.5	0.3	0.0	0.8	0.6	3.9	0.4	0.4	0.9	100.0	91.8	59.8	649
South West	60.5	15.0	3.6	0.4	0.5	0.2	1.1	0.3	0.3	9.9	1.3	0.3	6.6	100.0	79.4	124.0	541
Areas for LLIN malaria campaigns																	
World bank boosters[2]	67.4	18.5	1.0	0.0	0.3	0.0	0.0	0.1	0.4	9.8	0.1	0.1	2.4	100.0	87.3	53.8	1,920
Others with campaigns[3]	79.8	11.3	1.9	0.2	0.0	0.2	0.0	0.1	0.2	4.0	0.0	0.0	2.4	100.0	92.6	31.0	1,611
Others with no campaigns[4]	15.3	21.5	4.6	0.5	0.7	0.5	0.7	0.6	1.8	46.3	3.9	1.1	2.7	100.0	42.0	351.3	1,493
Wealth quintile																	
Lowest	47.9	3.2	0.9	0.0	0.0	0.0	0.0	0.0	1.2	42.1	2.1	0.0	2.6	100.0	53.1	234.0	1,186
Second	63.6	14.9	1.5	0.0	0.0	0.1	0.0	0.0	0.8	15.3	1.5	0.1	2.3	100.0	80.6	115.9	1,026
Middle	61.8	21.1	2.4	0.2	0.3	0.2	0.1	0.7	0.3	8.6	0.5	0.2	3.4	100.0	84.0	74.6	1,165
Fourth	53.3	25.4	3.3	0.0	0.8	0.5	0.0	0.1	0.4	12.5	1.0	1.4	1.2	100.0	82.9	101.7	827
Highest	52.2	25.7	4.5	0.9	0.6	0.3	1.1	0.4	1.0	10.1	0.6	0.4	2.2	100.0	82.4	123.2	819
Total	55.9	17.1	2.4	0.2	0.3	0.2	0.2	0.2	0.7	18.8	1.2	0.4	2.4	100.0	75.5	133.3	5,024

[1] Includes nets obtained for free. Cost is in Nigerian naira.
[2] World Bank Booster LLIN campaign States include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Households in the highest wealth quintile (26 percent of nets) are more likely than those in the lowest quintile (3 percent of nets) to obtain mosquito nets from a primary health centre or health post. On the other hand, poorer households are much more likely (42 percent of nets among poorer households) than all other households (9 to 15 percent) to obtain their nets from the open market.

Table 5.2 also shows that 76 percent of nets in Nigeria are obtained at no cost. Including free nets into the calculation of the average, the average cost for one net is 133 naira.

5.1.3 Indoor Residual Spraying

As part of its efforts towards combating malaria in Nigeria, the Federal Ministry of Health has included indoor residual spraying (IRS) as a prevention strategy. IRS is a procedure in which the interior walls are sprayed with a chemical that has a long-lasting effect against mosquitoes. In the 2010 NMIS, information was collected on household IRS in the 12 months before the survey. Table 5.3 presents the findings.

Table 5.3 Indoor residual spraying against mosquitoes

Percentage of households in which someone has come into the dwelling to spray the interior walls against mosquitoes (IRS) in the past 12 months, and the percentage of households with at least one ITN and/or IRS in the past 12 months, by background characteristics, Nigeria 2010

Background characteristic	Percentage of households with IRS[1] in the past 12 months	Percentage of households with at least one ITN[2] and/or IRS in the past 12 months	Number of households
Residence			
Urban	0.5	33.3	1,720
Rural	0.8	45.2	4,175
Zone			
North Central	0.3	32.2	951
North East	0.1	62.9	858
North West	0.5	58.5	1,296
South East	0.5	32.4	678
South South	2.9	44.2	859
South West	0.2	20.4	1,253
Areas for LLIN malaria campaigns			
World Bank Booster[3]	1.7	71.8	1,244
Others with campaigns[4]	0.7	75.7	981
Others with no campaigns[5]	0.4	22.5	3,670
Wealth quintile			
Lowest	0.4	49.5	1,116
Second	0.1	44.2	1,136
Middle	0.6	46.5	1,128
Fourth	1.4	36.5	1,182
Highest	1.1	33.8	1,334
Total	0.7	41.7	5,895

[1] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organization.
[2] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[3] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[4] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[5] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Overall, less than 1 percent of the households report that they have had IRS in the prior 12 months. There are no major variations by background characteristics, mainly because of the very small number of households in which someone has come into the dwelling to spray the interior walls against mosquitoes in the past year.

More than four in ten (42 percent) of households surveyed in the 2010 NMIS have at least one ITN and/or have had IRS in the last 12 months. This percentage is higher among rural (45 percent) than urban households (33 percent). Looking at zonal variations, the percentage of households with at least one ITN and/or IRS in the preceding 12 months is lowest in South West (20 percent) and highest in North East (63 percent). In the LLIN World Bank Booster areas (72 percent) and in other areas with LLIN campaigns (76 percent), the households are much more likely to own at least one ITN than in areas where there are no LLIN campaigns (23 percent). About one-third of households in the highest wealth quintile (34 percent) have at least one ITN and/or had IRS in the past 12 months, compared with half of the households in the lowest wealth quintile.

Table 5.4 shows the source of indoor residual spraying by organization. Two-thirds (65 percent) of the households that had IRS in the previous 12 months report that their dwellings were sprayed by a government worker or program, and one-fourth (25 percent) report that spraying was done by a private company.

Table 5.4 Source of indoor residual spraying by organization

Among households in which someone has come into the dwelling to spray interior walls against mosquitoes in the past 12 months, percentage who received the spraying from various organizations, Nigeria 2010

Organization which sprayed dwelling	Percent distribution of sources of IRS	Number of households sprayed in past 12 months
Government worker or program	65.4	31
Private company	24.8	12
Other	5.3	2
Don't know/missing	4.5	2
Total	100.0	47

5.1.4 Use of Mosquito Nets by Persons in the Household

The 2010 NMIS collected information on the use of mosquito nets by persons in the sampled households. Table 5.5 shows the percentages of the de facto household population that slept the night before the survey (1) under a mosquito net, (2) under an ITN, (3) under an LLIN, and (4) under an ITN or in a dwelling that underwent IRS in the past 12 months, by background characteristics. It also shows the percentage of the de facto household population that slept under an ITN the night before the survey among those who live in households with at least one ITN, by background characteristics.

Overall, 24 percent of the household population slept under any type of net the previous night; 23 percent, each, slept (1) under an ITN, (2) under an LLIN, or (3) under an ITN or in a dwelling that was sprayed with insecticides. Young children under age 5 and 35-39 year-olds are more likely to sleep under any net, under an ITN, under an LLIN, or under an ITN or in a dwelling that was sprayed with insecticides (28 to 30 percent) than other people in the household. Females (25 to 26 percent) are more likely than males (21 to 22 percent) to sleep under any of the specified nets or in a dwelling that was sprayed. The percentage of the household population that slept the night before under any of the specified nets or in a dwelling with IRS is higher among rural areas (25 to 27 percent) than urban areas (16 to 17 percent). Looking at zonal variations, the percentage of the household population that used a net the night

before or who live in a dwelling that was sprayed in the last 12 months is lowest in South West (8 to 9 percent) and highest in North East (42 to 46 percent). The populations in LLIN World Bank Booster areas (40 to 43 percent) and in areas with other LLIN campaigns (41 percent) are much more likely to sleep under a net or in a dwelling with IRS than the populations in areas where there are no LLIN campaigns (11-12 percent). Only 13 to 14 percent of the household population in the highest wealth quintile used a mosquito net or slept in a dwelling sprayed with IRS compared with 30 to 33 percent of the population in the lowest wealth quintile.

When net usage is measured only among the population in households with at least one ITN, the percentage of those who slept under an ITN increases. Half the population that lives in households with at least one ITN actually slept under an ITN the night before the survey (49 percent). The variation by background characteristics is similar to that observed for net usage among the whole population.

Table 5.5 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among the de facto household population in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Nigeria 2010

	Household population					Household population in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN[2] last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[3] in the past 12 months	Number	Percentage who slept under an ITN[1] last night	Number
Age (in years)							
<5	30.3	28.9	28.7	29.2	6,234	58.6	3,078
5-14	19.2	18.3	18.2	18.6	8,303	37.8	4,012
15-34	23.1	22.0	21.9	22.4	8,625	48.3	3,935
35-39	28.6	27.6	27.5	28.0	3,792	56.1	1,867
50+	21.6	20.7	20.5	20.8	3,413	56.8	1,243
Sex							
Male	21.9	20.7	20.6	21.1	15,150	44.7	7,025
Female	26.2	25.1	25.0	25.4	15,236	53.9	7,112
Residence							
Urban	17.0	16.3	16.2	16.5	8,097	42.4	3,116
Rural	26.6	25.4	25.2	25.7	22,290	51.3	11,021
Zone							
North Central	14.4	14.2	14.2	14.4	5,017	38.5	1,852
North East	45.5	42.2	41.7	41.7	4,812	62.8	3,233
North West	32.5	31.4	31.4	32.1	7,956	53.9	4,638
South East	13.2	12.7	12.5	12.8	3,095	34.6	1,138
South South	22.0	21.4	21.2	22.5	4,264	46.2	1,977
South West	8.9	8.0	8.0	8.2	5,243	32.2	1,299
Areas for LLIN malaria campaigns							
World Bank Booster[4]	43.2	40.4	39.9	40.4	6,857	54.5	5,074
Others with campaigns[5]	41.1	40.7	40.7	41.2	5,530	50.8	4,433
Others with no campaigns[6]	11.5	10.8	10.8	11.2	18,000	42.2	4,630
Wealth quintile							
Lowest	32.7	30.6	30.4	30.7	6,109	60.4	3,096
Second	27.2	26.6	26.5	26.5	6,045	53.4	3,012
Middle	28.9	27.5	27.4	27.8	6,074	52.7	3,167
Fourth	17.6	16.7	16.6	17.4	6,078	39.5	2,571
Highest	13.8	13.3	13.1	14.0	6,081	35.4	2,291
Total	24.0	22.9	22.8	23.3	30,387	49.3	14,137

Total includes three cases with missing information on age.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months
[2] A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.
[3] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organization.
[4] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[5] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[6] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

5.1.5 Use of Mosquito Nets by Children under Age 5

The use of mosquito nets by children under age 5 is summarized in Table 5.6. Thirty percent of children under age 5 in all households are reported to have slept under any net the night before the survey. A similar proportion (29 percent each) slept under an ITN, under an LLIN, or under an ITN or in a dwelling that was sprayed. This percentage of children who slept under any of the specified nets or in a dwelling sprayed with IRS does not vary much by a child's age or sex. However, it varies by residence, zone, campaign area, and wealth quintile. It is higher among children living in rural than in urban areas, it is highest in North East and lowest in South West, and it is notably higher among children who live in areas with LLIN malaria campaigns than among those who live in areas with no campaigns (Figure 5.3). Children in the highest wealth quintile are the least likely to sleep under any net, under an ITN, under an LLIN, or under an ITN or in a dwelling sprayed with IRS.

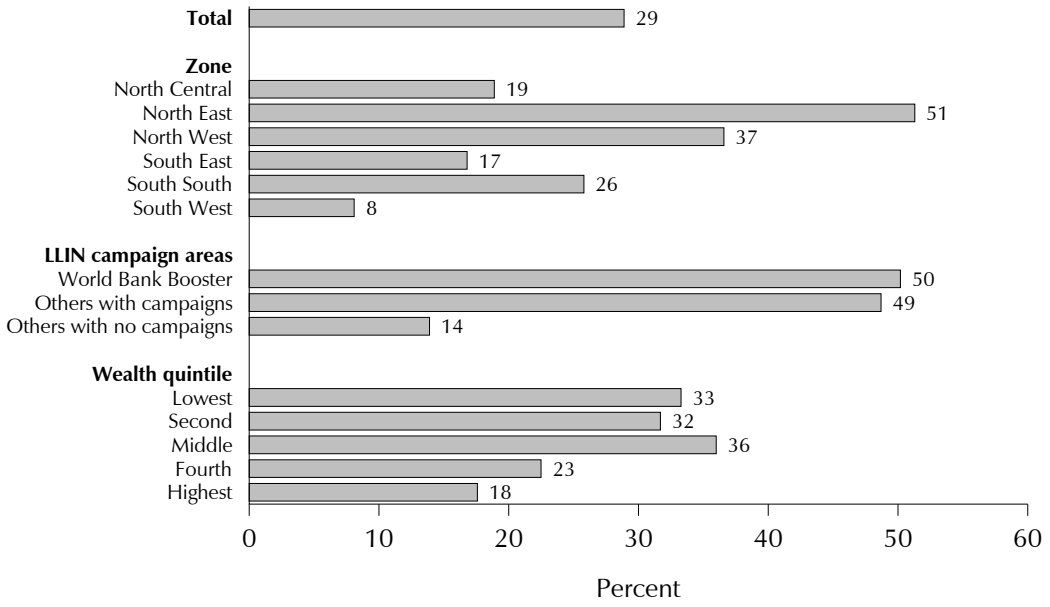
Table 5.6 Use of mosquito nets by children

Percentage of children under age 5 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes in the past 12 months; and among children under age 5 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Nigeria 2010

	Children under age 5 in all households					Children under age 5 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN[2] last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[3] in the past 12 months	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age (in months)							
<12	29.7	27.9	27.6	28.1	1,172	59.0	554
12-23	32.0	30.8	30.6	31.6	1,185	62.5	584
24-35	33.0	31.4	31.2	31.9	1,180	61.1	607
36-47	29.1	27.7	27.7	28.3	1,271	57.0	619
48-59	28.2	27.1	27.0	27.5	1,427	54.3	713
Sex							
Male	30.4	29.0	28.8	29.4	3,154	57.6	1,589
Female	30.2	28.8	28.6	29.4	3,080	59.6	1,489
Residence							
Urban	23.4	22.5	22.2	22.9	1,420	52.8	604
Rural	32.3	30.8	30.6	31.3	4,815	60.0	2,474
Zone							
North Central	18.9	18.9	18.9	19.1	977	49.5	373
North East	55.7	51.3	50.4	51.3	968	73.5	675
North West	37.6	36.6	36.6	37.1	2,008	63.3	1,162
South East	17.4	16.8	16.1	17.6	503	42.0	201
South South	26.7	25.8	25.7	26.7	896	55.1	420
South West	9.7	8.1	8.1	8.7	883	28.8	248
Areas for LLIN malaria campaigns							
World Bank Booster[4]	53.8	50.2	49.5	50.6	1,476	65.5	1,132
Others with campaigns[5]	49.1	48.7	48.7	49.3	1,147	60.5	922
Others with no campaigns[6]	14.7	13.9	13.9	14.4	3,611	49.1	1,024
Wealth quintile							
Lowest	36.1	33.3	33.0	33.6	1,347	72.8	616
Second	32.2	31.7	31.6	31.7	1,335	62.7	676
Middle	37.2	36.0	35.9	36.4	1,353	60.5	804
Fourth	24.0	22.5	22.5	23.4	1,161	47.5	550
Highest	18.5	17.6	17.2	18.5	1,039	42.4	431
Total	30.3	28.9	28.7	29.4	6,234	58.6	3,078

Note: Table is based on children who stayed in the household the night before the interview.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[2] A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.
[3] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organization.
[4] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[5] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[6] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Figure 5.3 Differentials in ITN Usage among Children Under Age Five

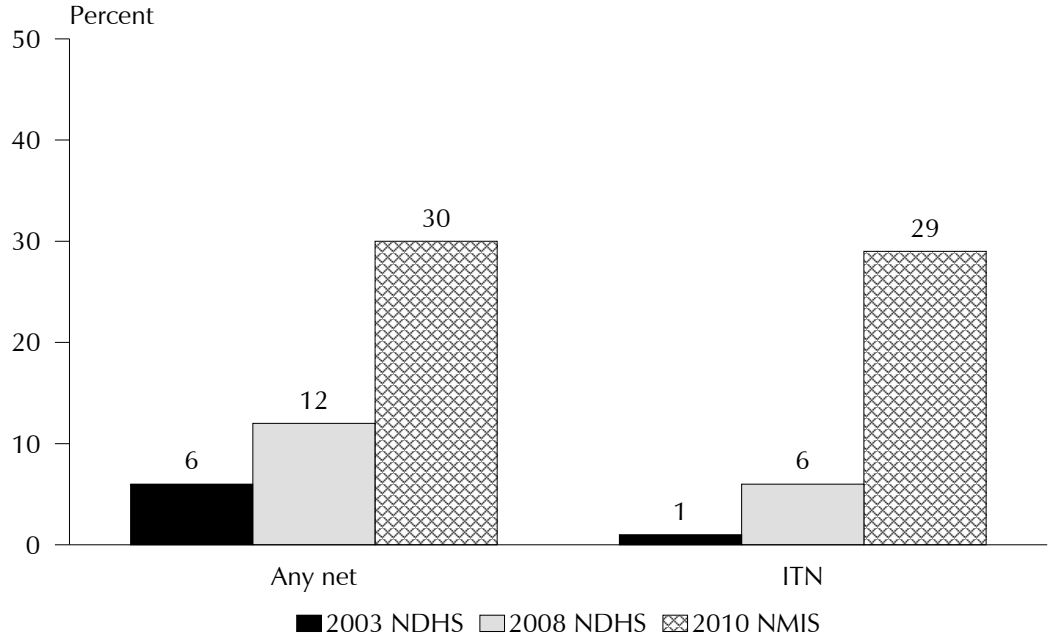


Nigeria 2010

Figure 5.4 shows that, compared with previous DHS surveys, the percentage of children under age 5 who slept under any net has increased steadily and substantially from 6 percent in 2003 to 12 percent in 2008 and to 30 percent in 2010. Furthermore, the percentage of children under age 5 who slept under an ITN increased from 1 percent in 2003 to 6 percent in 2008 and to 29 percent in 2010 (NPC and ORC Macro, 2004; NPC and ICF Macro, 2009).

Among children living in households that own an ITN, 59 percent slept under an ITN the night before the survey. Data do not show a clear trend or pattern in net usage by age or sex of the child. Children in households in urban areas that have at least one ITN are less likely to sleep under an ITN the previous night (53 percent) than children in households in rural areas (60 percent). By zone, this percentage ranges from 29 percent of children in South West to 74 percent of children in North East. Young children in LLIN World Bank Booster areas (66 percent) and in areas with other LLIN campaigns (61 percent) are more likely to sleep under an ITN than children in areas where there are no LLIN campaigns (49 percent). Wealth shows an inverse relationship for ITN usage among children under age 5 in households with at least one ITN. While 73 percent of children in the lowest wealth quintile slept under an ITN the previous night, only 42 percent of children in the highest wealth quintile did so.

Figure 5.4 Trends in Net Use among Children Under Age Five



Nigeria 2010

5.1.6 Use of Mosquito Nets by Women

Table 5.7 shows the usage of nets by all women age 15-49 years, while Table 5.8 provides similar information for women who were pregnant at the time of the survey.

About three in ten (29 percent) of all women in all households reported that they slept under any net the night before the survey, an increase from about one in ten (9 percent) in the 2008 NDHS. A similar percentage (28 percent) reported that they slept under an ITN the night before the survey, an increase from 4 percent in 2008. The data further show that 28 percent slept under an LLIN the night before the survey, indicating that almost all ITNs are LLINs. Overall, 29 percent of all women slept under an ITN or in a dwelling sprayed with IRS.

Regardless of the type of net (any net, ITN, or LLIN), net usage is higher among rural women (32 to 34 percent) than among urban women (18 to 19 percent). Women in North East (51 to 55 percent) are the most likely to have slept under any of the specified nets the previous night, and women in South West are the least likely (10 to 11 percent). About half of women in the LLIN World Bank Booster areas and in areas with other LLIN campaigns reported that they slept under any net, an ITN, or an LLIN the previous night compared with about one in eight women in areas where there are no LLIN campaigns. Wealth and education show an inverse relationship for net usage among women. For example, 17 percent of women with more than secondary education slept under a net, an ITN, or an LLIN the previous night compared with 42 to 44 percent of women with no education.

When looking at all women in households with at least one ITN, six in ten women slept under an ITN the previous night, an increase from four in ten in 2008. This proportion is highest among rural women (63 percent), women in North East (76 percent), those living in LLIN World Bank Booster areas (68 percent) and in areas with other LLIN campaigns (61 percent), and among uneducated women (72 percent) and poorest women (74 percent).

Table 5.7 Use of mosquito nets by all women

Percentages of all women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes in the past 12 months; and among all women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Nigeria 2010

	Among all women age 15-49 in all households					Among all women age 15-49 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN[2] last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[3] in the past 12 months	Number of women	Percentage who slept under an ITN[1] last night	Number of women
Residence							
Urban	19.2	18.5	18.4	18.7	1,852	47.3	725
Rural	33.5	32.2	32.0	32.7	4,665	63.2	2,379
Zone							
North Central	19.6	19.5	19.5	19.7	1,063	50.9	408
North East	54.8	51.5	50.7	51.5	976	76.0	661
North West	42.6	41.5	41.5	42.4	1,628	69.3	975
South East	14.9	14.2	14.0	14.4	700	35.6	279
South South	25.2	24.6	24.4	25.2	983	53.3	455
South West	11.0	10.3	10.3	10.6	1,167	36.9	325
Areas for LLIN malaria campaigns							
World Bank Booster[4]	54.6	51.6	51.0	51.7	1,501	68.1	1,137
Others with campaigns[5]	48.3	48.1	48.1	48.7	1,220	60.7	966
Others with no campaigns[6]	13.4	12.8	12.7	13.2	3,795	48.6	999
Education							
No education	43.5	41.8	41.5	42.0	2,772	71.6	1,616
Primary	23.1	21.9	21.8	22.4	1,122	54.8	448
Secondary	17.3	16.9	16.7	17.4	2,126	43.5	825
More than secondary	16.9	16.9	16.9	17.6	493	39.3	211
Wealth quintile							
Lowest	40.6	38.5	38.1	38.8	1,200	73.8	626
Second	36.5	35.9	35.7	35.9	1,210	68.9	630
Middle	36.0	34.6	34.5	34.9	1,308	65.3	692
Fourth	21.0	20.2	20.2	20.7	1,303	46.9	562
Highest	16.3	15.7	15.6	16.5	1,496	39.7	592
Total	29.4	28.3	28.2	28.7	6,517	59.5	3,103

Note: Table is based on women who stayed in the household the night before the interview.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[2] A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.
[3] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or nongovernmental organization.
[4] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[5] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[6] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

Table 5.8 shows that more than one-third (34 to 35 percent) of pregnant women age 15-49 reported sleeping under any of the specified nets (any net, ITN, or LLIN) the night before the interview. This shows an increase from 12 percent (any net) and 5 percent (an ITN) reported in the 2008 NDHS. Net usage varies by residence, zone, educational attainment, and wealth quintile. Among pregnant women in all households, those in rural areas are more than twice as likely to use any type of the specified nets as their urban counterparts. For example, 39 percent of pregnant women in rural areas slept under an ITN compared with 16 percent in urban areas. Among zones, usage of any net (any net, ITN, or LLIN) is the lowest in the South East (12 percent) and the highest in the North East (47 to 56 percent). About half of pregnant women with no education slept under any of the specified nets the previous night, compared with about one-fifth of pregnant women with any level of education. Looking at wealth, the women in the highest wealth quintile are the least likely to have slept under any of the nets on the previous night (17 to 18 percent).

Among pregnant women living in households with at least one ITN, 65 percent slept under an ITN the previous night, an increase from 44 percent in 2008. The variation by background characteristics in ITN use by pregnant women in households with at least one ITN follows patterns similar to those observed for pregnant women in all households.

Table 5.8 Use of mosquito nets by pregnant women

Percentages of pregnant women age 15-49 in all households who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Nigeria 2010

	Among pregnant women age 15-49 in all households					Among pregnant women age 15-49 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN[2] last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[3] in the past 12 months	Number of women	Percentage who slept under an ITN[1] last night	Number of women
Residence							
Urban	16.5	16.1	16.1	16.9	166	38.5	69
Rural	40.7	38.6	38.4	38.9	586	71.3	317
Zone							
North Central	36.7	36.1	36.1	36.1	134	70.3	69
North East	55.5	47.7	46.8	47.7	130	74.9	83
North West	45.0	44.6	44.6	44.6	217	73.5	132
South East	12.0	12.0	12.0	13.2	57	(29.6)	23
South South	20.5	20.5	20.5	22.0	112	48.1	48
South West	17.1	15.9	15.9	16.5	103	(49.0)	33
Areas for LLIN malaria campaigns							
World Bank Booster[4]	58.5	53.0	52.4	53.0	184	74.8	130
Others with campaigns[5]	68.4	67.1	67.1	67.1	154	79.0	131
Others with no campaigns[6]	12.8	12.5	12.5	13.3	413	41.3	125
Education							
No education	49.9	47.0	46.7	47.0	389	78.1	234
Primary	18.8	17.9	17.9	19.2	126	40.8	55
Secondary	20.1	19.7	19.7	20.4	194	51.4	75
More than secondary	(20.6)	(20.6)	(20.6)	(20.6)	42	*	22
Wealth quintile							
Lowest	39.0	36.2	35.6	36.2	174	72.3	87
Second	42.3	40.9	40.9	40.9	136	76.6	73
Middle	53.3	49.9	49.9	50.3	155	76.5	101
Fourth	22.8	22.8	22.8	24.1	143	49.9	65
Highest	17.8	17.0	17.0	17.4	144	40.2	61
Total	35.4	33.6	33.5	34.0	752	65.4	387

Note: Table is based on women who stayed in the household the night before the interview. Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[2] A long-lasting insecticidal mosquito net (LLIN) is a factory-treated net that does not require any further treatment.
[3] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization.
[4] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[5] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[6] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

5.1.7 Reasons for Not Using a Mosquito Net

Net ownership does not guarantee usage. Table 5.9 shows the percent distribution of households that own a net that no one slept under during the night preceding the survey, by the main reason for not using the net. Overall, 18 percent of households had at least one net that was not slept under the previous night (data not shown separately), a decrease from 28 percent of households in the 2008 NDHS.

Table 5.9 Reason for not using the net the night preceding the interview

Percent distribution of households with at least one mosquito net that was not slept under the previous night, by the main reason for not using the net, according to background characteristics, Nigeria 2010

Background characteristic	Reason no one slept under the net																	Number of households with at least one mosquito net that was not slept under the previous night
	No mosquitoes	No malaria	Too hot	Difficult to hang	Don't like smell	Feel 'closed in' or constrained	Net too old or torn	Net too dirty	Net not available last night (washing)	Feel ITN chemicals are unsafe	ITN provokes coughing	Usual user(s) did not sleep here last night	Net not needed last night	Other	Don't know	Missing	Total	
Residence																		
Urban	11.2	0.8	18.2	23.1	1.3	1.8	3.2	3.1	2.6	1.7	0.1	1.4	13.2	2.3	7.8	8.0	100.0	360
Rural	13.4	0.3	17.7	12.8	2.2	3.7	4.5	4.5	2.5	1.5	1.3	2.7	14.2	2.0	2.9	13.8	100.0	683
Zone																		
North Central	8.5	2.5	21.3	12.7	0.6	9.9	10.7	1.5	4.2	1.4	0.0	2.4	3.0	5.3	4.9	11.2	100.0	127
North East	8.4	1.5	4.9	13.3	2.7	0.7	4.4	3.5	6.7	0.0	0.0	7.3	1.0	0.0	5.4	40.3	100.0	97
North West	17.2	0.0	30.6	4.5	3.2	0.0	2.2	8.1	0.3	1.3	0.0	0.0	3.9	1.0	2.4	25.3	100.0	154
South East	11.3	0.0	12.6	35.7	0.7	0.9	4.4	2.4	3.3	4.3	0.1	3.1	14.2	2.0	3.1	1.9	100.0	199
South South	5.3	0.3	18.4	8.4	2.1	6.3	3.5	2.6	0.9	0.0	0.2	1.0	39.8	2.8	5.0	3.3	100.0	223
South West	21.6	0.0	16.9	18.4	2.2	1.1	1.9	5.5	2.2	1.6	3.5	2.2	7.0	1.5	6.3	8.2	100.0	242
Areas for LLIN malaria campaigns																		
World Bank Booster[1]	6.1	0.4	17.0	15.7	1.1	3.9	2.0	4.5	2.5	2.3	0.0	2.3	26.0	2.4	4.8	8.9	100.0	355
Others with campaigns[2]	20.1	0.4	16.7	18.1	4.0	4.4	1.1	4.0	2.1	1.2	2.7	1.2	4.2	2.3	3.9	13.5	100.0	319
Others with no campaigns[3]	12.5	0.7	19.6	15.5	0.8	1.0	8.6	3.6	2.8	1.2	0.1	3.2	10.7	1.6	5.0	13.2	100.0	370
Wealth quintile																		
Lowest	11.8	0.8	7.9	5.3	4.7	3.1	2.5	2.4	4.5	0.0	0.0	6.1	6.4	3.8	2.7	37.8	100.0	93
Second	14.7	0.0	11.4	18.8	0.0	1.9	4.4	1.8	1.3	1.5	0.0	1.0	16.4	3.6	8.9	14.2	100.0	129
Middle	15.3	1.1	24.7	11.7	2.0	3.6	6.2	4.8	2.5	0.3	1.8	2.0	10.1	0.8	1.9	11.2	100.0	207
Fourth	10.9	0.0	15.1	23.1	1.1	2.2	4.6	3.5	2.4	2.1	0.0	3.1	14.8	0.9	4.8	11.3	100.0	262
Highest	11.9	0.7	20.8	16.0	2.3	3.7	2.7	5.1	2.5	2.3	1.5	1.3	16.5	2.8	4.9	4.9	100.0	353
Total	12.7	0.5	17.9	16.3	1.9	3.0	4.1	4.0	2.5	1.6	0.9	2.3	13.9	2.1	4.6	11.8	100.0	1,043

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

The most common reason why no one slept under the household net the previous night is that it was too hot to sleep under the net (18 percent of households), with the percentages being higher among households in North West (31 percent).

Sixteen percent of households reported that the net was too difficult to hang, with the percentage being higher in urban households (23 percent), households in South East (36 percent), and households in the fourth highest wealth quintile (23 percent). Finally, 14 percent of households reported that the net was not needed last night, and 13 percent reported that there were no mosquitoes.

5.2 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

To reduce the risks of pregnant women getting malaria, the current policy under the National Malaria Control Programme calls for all pregnant women to receive at least two doses of sulfadoxine-pyrimethamine (SP/Fansidar). Women receive SP/Fansidar during their antenatal care visits under directly observed therapy. It is also possible that pregnant women obtain SP/Fansidar from sources outside of antenatal care visits.

Table 5.10 presents the percent distribution of women age 15-49 who had a live birth in the five years preceding the survey by the type of antenatal care provider consulted during the pregnancy for the most recent birth. More than half of women (58 percent) received antenatal care from a skilled provider,

Table 5.10 Antenatal care

Percent 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 percentage receiving antenatal care from a skilled provider for the most recent birth, according to background characteristics, Nigeria 2010

Background characteristic	Doctor	Nurse/ midwife	Auxiliary midwife	Community health extension worker	Traditional birth attendant	Community oriented resource	Other	No one	Missing	Total	Percentage receiving antenatal care from skilled provider[1]	Number of women
Age at birth												
<20	6.3	35.5	3.1	2.8	1.7	0.0	0.0	50.3	0.3	100.0	47.7	227
20-34	24.1	29.7	1.9	3.6	1.6	0.4	0.1	37.7	0.9	100.0	59.3	2,475
35-49	22.5	26.9	2.7	2.9	1.6	0.2	0.1	42.0	1.1	100.0	55.1	1,001
Birth order												
1	27.2	32.9	2.5	3.2	1.3	0.2	0.2	31.6	0.8	100.0	65.9	604
2-3	23.2	31.8	1.4	3.0	1.8	0.4	0.1	37.5	0.8	100.0	59.4	1,139
4-5	24.0	28.7	2.2	3.6	2.3	0.4	0.1	38.2	0.5	100.0	58.6	959
6+	17.7	24.8	3.0	3.7	0.8	0.2	0.0	48.4	1.5	100.0	49.1	1,001
Residence												
Urban	40.2	32.1	1.6	1.9	2.1	0.6	0.1	20.7	0.6	100.0	75.8	873
Rural	17.1	28.4	2.4	3.9	1.4	0.2	0.1	45.5	1.0	100.0	51.8	2,830
Zone												
North Central	24.0	35.1	0.5	6.7	0.0	0.3	0.0	33.2	0.2	100.0	66.3	591
North East	4.6	18.6	0.4	7.4	0.0	0.0	0.0	67.8	1.2	100.0	31.1	607
North West	7.2	26.2	4.3	0.4	0.0	0.1	0.0	60.9	1.0	100.0	38.0	1,144
South East	43.4	45.6	2.1	1.8	1.1	0.0	0.8	4.5	0.7	100.0	92.8	274
South South	35.7	30.3	3.2	4.4	3.1	0.5	0.3	22.1	0.5	100.0	73.6	530
South West	49.5	32.1	1.0	1.4	7.0	1.0	0.0	6.2	1.8	100.0	84.0	557
Education												
No education	7.0	20.7	2.4	4.1	0.9	0.3	0.0	63.4	1.2	100.0	34.2	1,929
Primary	29.7	39.8	3.0	2.7	2.9	0.3	0.4	21.0	0.2	100.0	75.2	691
Secondary	42.2	39.5	1.6	3.1	2.1	0.3	0.1	10.1	1.0	100.0	86.5	912
More than secondary	64.0	29.3	0.0	0.5	1.1	0.0	0.4	3.9	0.6	100.0	93.9	170
Wealth quintile												
Lowest	2.6	12.9	1.6	4.7	0.4	0.1	0.0	76.1	1.6	100.0	21.8	808
Second	11.8	29.3	3.2	3.0	1.4	0.3	0.1	50.4	0.5	100.0	47.4	784
Middle	14.9	37.3	2.1	5.3	1.3	0.2	0.1	38.0	0.8	100.0	59.6	785
Fourth	32.4	41.1	3.0	2.0	3.5	0.1	0.3	17.1	0.4	100.0	78.6	662
Highest	58.7	27.9	1.1	1.4	1.8	0.8	0.1	7.0	1.1	100.0	89.2	664
Total	22.6	29.3	2.2	3.4	1.6	0.3	0.1	39.6	0.9	100.0	57.5	3,703

[1] Skilled provider includes doctor, nurse/midwife, auxiliary midwife, and community health extension worker (CHEW).

40 percent did not receive any antenatal care, and 2 percent received antenatal care from an unskilled provider. Antenatal care is more prevalent in urban than rural areas; 76 percent of women in urban areas received antenatal care from a skilled provider compared with 52 percent of rural women. Among zones, the percentage of women receiving antenatal care from a skilled provider ranges from 31 percent in the North East to 93 percent in the South East. Education and wealth are positively associated with an increase in the percent of women who received antenatal care from a skilled provider. For example, 34 percent of women with no education received antenatal care from a skilled provider contrasted with 94 percent of women with more than a secondary education. Similarly, 22 percent of women in the lowest wealth quintile received antenatal care from a skilled provider contrasted with 89 percent of women in the highest wealth quintile.

The proportion of women receiving antenatal care from a skilled provider is exactly the same as that reported in the 2008 Nigeria Demographic and Health Survey—58 percent. There are only minor differences by the type of provider and by background characteristics.

The 2010 NMIS also included questions about malaria prevention for women with a live birth in the two years preceding the survey. Specifically, they were asked if, during the time they were pregnant with their most recent birth, they had taken any antimalarial medicine to prevent getting malaria during the pregnancy, and if so, what type of antimalarial 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 5.11 shows the percentages of women age 15-49 with a live birth in the two years preceding the survey who, during the pregnancy, took an antimalarial drug for prevention, took SP/Fansidar, or received intermittent preventive treatment during pregnancy (IPTp). Three in ten women (30 percent) with a live birth in the two years preceding the survey report taking some type of antimalarial medicine to prevent getting malaria during the last pregnancy, higher than the percentage reported in the 2008 NDHS (18 percent). One in five women (20 percent) say they took SP/Fansidar at least once during the pregnancy, compared with 11 percent in 2008. Overall, 15 percent of women say they took SP/Fansidar during an ANC visit.

Women in urban areas (46 percent) are more likely to take any antimalarial drugs during pregnancy compared with their rural counterparts (25 percent). The percentage of women who reported taking antimalarial medicines to prevent malaria during pregnancy ranges from 20 percent in the North East zone to 44 percent in South South. Use of any antimalarials during pregnancy increases dramatically with women's education, from 16 percent of uneducated women to 65 percent of those with more than secondary education. It also increases with wealth, from 9 percent of the poorest women to 54 percent of the richest women.

Intermittent preventive treatment during pregnancy or IPTp is defined as the percentage of pregnant women who received two or more doses of SP/Fansidar, at least one of which was during an antenatal visit. In the 2010 NMIS, IPTp was estimated at 13 percent, an increase from 8 percent in 2008. Women in urban areas (19 percent), those in South South (20 percent), women with higher than secondary education (29 percent), and women in the highest quintile (24 percent) are more likely to receive IPTp than other women.

The NMIS 2010 also asked currently pregnant women about the antenatal care provider consulted during their pregnancy and what malaria preventive treatment was obtained (data not shown). Twelve percent of women in the survey were currently pregnant at the time of data collection. The percentage of currently pregnant women who received antenatal care from a skilled is lower than it is for women who have had a birth in the past five years (40 percent compared with 58 percent), because women generally receive antenatal care in the later months of gestation rather than the earlier months. Therefore, it is difficult to obtain representative information on antenatal care providers. Additionally, the number of women is too few to present data on and preventive treatment or IPTp for currently pregnant women. For this reason, data on currently pregnant women are not included in the report.

Table 5.11 Prophylactic use of antimalarial drugs and use of Intermittent Preventive Treatment (IPTp) by women during pregnancy

Percentages of women age 15-49 with a live birth in the two years preceding the survey who, during the pregnancy, took any antimalarial drug for prevention, who took any and two or more doses of SP/Fansidar, and who received intermittent preventive treatment (IPTp), by background characteristics, Nigeria 2010

		SP/Fansidar		Intermittent Preventive Treatment[1]		
Background characteristic	Percentage who took any antimalarial drug	Percentage who took any SP/Fansidar	Percentage who took 2+ doses of SP/Fansidar	Percentage who received any SP/Fansidar during an ANC visit	Percentage who took 2+ doses of SP/Fansidar and received at least one during ANC visit	Number of women with a live birth in the two years preceding the survey
Residence						
Urban	46.2	30.2	27.6	19.8	18.7	529
Rural	24.6	17.1	14.3	13.0	11.5	1,726
Zone						
North Central	28.9	12.2	10.4	7.1	7.1	352
North East	20.0	16.7	13.7	12.4	10.6	366
North West	22.0	20.0	16.2	15.9	13.5	692
South East	40.2	20.7	18.0	13.3	13.1	177
South South	43.7	28.5	25.0	22.2	20.4	313
South West	37.4	24.4	23.8	15.7	15.1	355
Areas for LLIN malaria campaigns						
World Bank Booster[2]	28.2	24.0	20.8	19.7	17.1	513
Others with campaigns[3]	29.3	20.5	19.2	15.3	14.9	418
Others with no campaigns[4]	30.3	18.5	15.6	12.4	11.2	1,324
Education						
No education	15.6	10.6	8.5	8.2	7.1	1,130
Primary	33.9	23.6	20.3	15.6	13.8	429
Secondary	46.9	31.6	28.5	23.2	21.6	586
More than secondary	64.7	43.5	39.4	30.4	28.6	109
Wealth quintile						
Lowest	8.6	5.8	4.6	4.7	4.3	485
Second	18.5	12.5	9.7	9.1	7.3	483
Middle	30.3	20.1	17.5	15.4	14.4	479
Fourth	43.1	28.9	24.7	20.5	18.6	409
Highest	54.1	38.0	34.9	26.4	24.3	398
Total	29.6	20.2	17.4	14.6	13.2	2,255

[1] IPTp: Intermittent preventive treatment during pregnancy is preventive treatment with a dose of sulfadoxine-pyrimethamine (SP/Fansidar) to pregnant women at each scheduled antenatal visit after the first trimester, but not more frequently than once a month. The percentages included in these columns may include SP/Fansidar from sources other than ANC, since women can get SP/Fansidar from a variety of sources.
[2] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

ANAEMIA AND MALARIA IN CHILDREN 6

6.1 ANAEMIA AND MALARIA AMONG CHILDREN

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

All children age 6-59 months living in the households selected for the 2010 NMIS were eligible for haemoglobin and malaria testing. The HemoCue system was used to measure the concentration of haemoglobin in the blood. The Paracheck Pf® rapid diagnostic blood test for detection of histidine rich protein-2 (HRP2) (supplied by Orchid Biomedical Systems, India) was used to detect malaria. Thick blood smears and thin blood films were made in the field and transported to a laboratory, where microscopy was performed to determine the presence of malaria parasites and to identify the parasite species.

Table 6.1 shows the total number of children age 6-59 months eligible for testing and the percentages actually tested for anaemia and malaria. Of the 5,612 children age 6-59 months eligible for testing, 91 percent were tested for anaemia using the HemoCue portable machine, 91 percent were tested for malaria using the rapid diagnostic test, and 91 percent were tested for malaria using blood smears collected for malaria microscopy. The coverage levels were uniformly high across most of the population. Testing coverage was somewhat lower among younger children age 6-11 months (87 percent) and among children in North West and South West zones (86 to 88 percent).

Table 6.1 Coverage of testing for anaemia and malaria in children

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria (unweighted), by background characteristics, Nigeria 2010

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT[1]	Malaria microscopy	Number of children
Age in months				
6-11	87.1	87.4	87.4	635
6-8	85.6	85.9	85.6	354
9-11	89.0	89.3	89.7	281
12-17	91.9	92.5	92.2	689
18-23	92.2	92.6	92.8	474
24-35	91.5	91.8	91.4	1,201
36-47	91.1	91.5	91.1	1,252
48-59	90.5	91.0	91.0	1,361
Child's sex				
Male	90.6	90.9	90.8	2,847
Female	91.0	91.5	91.2	2,765
Residence				
Urban	89.6	90.5	90.7	1,544
Rural	91.2	91.4	91.2	4,068
Zone				
North Central	96.6	96.3	96.1	916
North East	88.6	88.7	88.3	1,021
North West	85.6	88.0	88.1	1,426
South East	89.4	88.4	88.3	718
South South	98.0	98.0	97.3	980
South West	87.7	87.1	87.3	551
Areas for LLIN malaria campaigns				
World Bank Booster[2]	90.4	90.3	89.8	1,467
Others with campaigns[3]	87.6	91.4	91.0	1,009
Others with no campaigns[4]	92.0	91.5	91.6	3,136
Mother's education[5]				
No education	89.9	90.8	90.5	2,204
Primary	94.3	94.6	94.2	955
Secondary	92.9	92.8	92.9	1,328
More than secondary	89.1	89.1	89.1	230
Missing	86.4	86.8	86.6	895
Wealth quintile				
Lowest	89.9	90.0	89.7	1,041
Second	89.6	89.9	89.6	1,063
Middle	91.9	93.0	92.8	1,242
Fourth	92.2	92.7	92.5	1,221
Highest	90.0	89.8	90.0	1,045
Total	90.8	91.2	91.0	5,612

[1] RDT = Rapid Diagnostic Test (Paracheck Pf®)
[2] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.
[5] For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the Household Questionnaire.

6.1.1 Anaemia Prevalence among Children

Table 6.2 shows the percentage of children age 6-59 months with haemoglobin (Hb) lower than 11.0 grams per decilitre (g/dl), by background characteristics. The World Health Organization (WHO) has recommended specific Hb levels below which a child is specified as having anaemia. Children 6-59 months old are considered anaemic if the Hb concentration levels are below 11.0 g/dl; those age 5-11

Table 6.2 Prevalence of anaemia in children

Percentage of children age 6-59 months classified as having anaemia, by background characteristics, Nigeria, 2010

Background characteristic	Anaemia status by haemoglobin level			Any anaemia (below 11.0 g/dl)	Number of children
	Mild (10.0-10.9 g/dl)	Moderate (8.0-9.9 g/dl)	Severe (below 8.0 g/dl)		
Age in months					
6-11	18.8	44.0	13.2	76.0	569
6-8	20.0	42.1	13.2	75.3	325
9-11	17.3	46.5	13.1	76.9	245
12-17	20.7	43.2	17.3	81.2	666
18-23	21.2	37.9	19.4	78.5	425
24-35	27.1	33.4	14.0	74.5	1,065
36-47	24.7	31.1	10.6	66.4	1,140
48-59	25.9	30.4	8.3	64.7	1,281
Sex					
Male	24.9	34.9	13.6	73.4	2,593
Female	23.2	35.0	11.6	69.8	2,552
Mother's interview status					
Interviewed	23.8	35.4	12.5	71.7	4,348
Not interviewed[1]	25.5	32.5	13.2	71.2	798
Residence					
Urban	27.8	30.0	7.5	65.3	1,180
Rural	22.9	36.4	14.1	73.5	3,966
Zone					
North Central	28.4	20.6	7.0	56.0	857
North East	24.6	28.4	10.6	63.5	789
North West	19.6	41.2	17.5	78.3	1,553
South East	27.8	38.1	5.9	71.7	410
South South	24.5	41.9	15.5	81.9	820
South West	25.2	36.1	11.5	72.8	717
Areas for LLIN malaria campaigns					
World Bank Booster[2]	22.1	38.5	17.8	78.4	1,191
Others with campaigns[3]	20.8	35.3	12.4	68.6	929
Others with no campaigns[4]	25.8	33.4	10.6	69.9	3,026
Mother's education[5]					
No education	20.8	36.8	16.4	74.0	2,217
Primary	24.5	35.9	10.4	70.9	872
Secondary	27.7	33.3	7.5	68.5	1,077
More than secondary	33.0	28.3	5.1	66.4	182
Wealth quintile					
Lowest	21.1	34.9	15.6	71.6	1,084
Second	22.9	33.5	14.7	71.0	1,080
Middle	22.6	37.2	15.9	75.8	1,144
Fourth	26.7	37.1	9.5	73.3	980
Highest	28.2	31.4	5.3	64.8	857
Total	24.0	34.9	12.6	71.6	5,146

Note: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on haemoglobin (Hb) levels and is adjusted for altitude using CDC formulas (CDC, 1998). Haemoglobin is measured in grams per deciliter (g/dl).

[1] Includes children whose mothers are deceased

[2] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.

[3] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.

[4] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

[5] For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not interviewed.

years are considered anaemic if Hb is below 11.5 g/dl, and children age 12-14 years are considered anaemic if Hb is below 12.0 g/dl (WHO, 2004). The likely cause of childhood anaemia varies depending on the area of the world in which the child lives. Overall, iron deficiency is the most common cause of anaemia. However, in the developing countries, infectious diseases such as malaria, helminthes infections, HIV, and tuberculosis are also important (WHO, 2001; Coyer, 2005; Asobayire et al, 2001).

Table 6.2 shows the percentage of children age 6-59 months old classified as having mild, moderate, and severe anaemia, by background characteristics[1]. The results of the 2010 NMIS show that more than seven in ten (72 percent) Nigerian children age 6-59 months are anaemic (Hb concentration levels are below 11.0 g/dl). Twenty-four percent are mildly anaemic (Hb levels of 10.0-10.9 g/dl), 35 percent are moderately anaemic (Hb levels of 8.0-9.9 g/dl), and 13 percent are severely anaemic (Hb levels below 8.0 g/dl). Based on these findings, anaemia seems to be a significant public health problem in Nigeria.[2]

The prevalence of severe anaemia is highest among children age 12-23 months (17 to 19 percent), rural children (14 percent), children living in North West (18 percent), and children in the World Bank Booster LLIN campaign areas (18 percent). Prevalence of severe anaemia decreases with an increase in mother's education, from 16 percent among children of uneducated mothers to 5 percent among children of mothers with more than secondary education. It is also reversely associated with wealth; it decreases from 16 percent among children in the poorest households to 5 percent of children in the richest households.

Prevalence of any anaemia is highest among children age 12-23 months (79 to 81 percent), male children (73 percent), and children living in rural areas (74 percent). The proportion of children with any anaemia ranges from 56 percent in North Central to 82 percent in South South. It is highest among children in the World Bank Booster LLIN campaign areas (78 percent) when compared with children in other areas. Prevalence of any anaemia decreases with an increase in mother's education, from 74 percent among children of uneducated mothers to 66 percent among children of mothers with more than secondary education. It tends to decrease with wealth, although the pattern is not linear.

6.1.2 Malaria Prevalence among Children

Malaria prevalence among children age 6-59 months was measured in the 2010 NMIS in two ways. In the field, laboratory scientists used the Paracheck Pf® rapid diagnostic blood test (RDT) to determine whether children had malaria; blood was obtained from finger- or heel-prick samples. Children with positive RDT results were offered antimalarial treatment according to the Nigeria malaria treatment protocol. In addition, thin and thick smears from each child's blood were made in the field, dried in a dust-free environment, stored in slide boxes, and transported within seven days to the NMIS Laboratory at the Department of Medical Microbiology and Parasitology, Lagos University Teaching Hospital, Lagos state, for confirmatory microscopy testing.

Table 6.3 shows the results of both malaria tests (RDT and microscopy) among children age 6-59 months by background characteristics. Data show that malaria prevalence is higher with RDTs than with microscopy. This is expected because false positive test results are possible with RDTs. Other studies have shown a higher prevalence of malaria using RDTs instead of microscopy (Wongsrichanalai et al, 2007).

[1] Given that haemoglobin requirements differ substantially depending on altitude, anaemia data are normally adjusted for altitude using the formulas recommended by the U.S. Centers for Disease Control and Promotion (CDC, 1998).

[2] Note that the cutoff value for malaria-related anaemia (8.0 g/dl) differs from the standard cutoff value for severe anaemia used in nutrition analysis (7.0 g/dl).

Table 6.3 Malaria prevalence in children

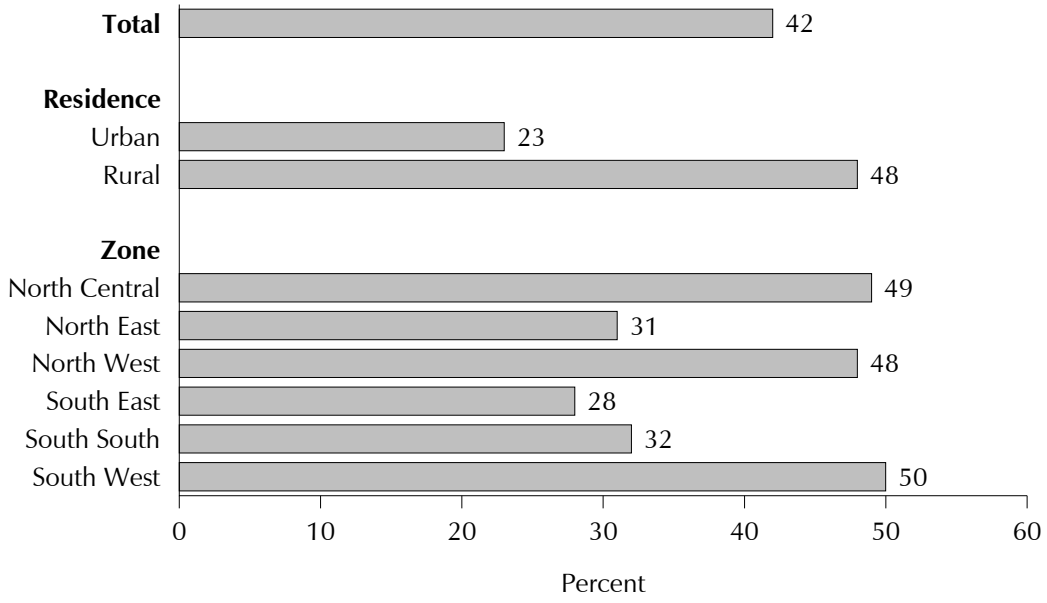
Percentage of children age 6-59 months classified in two tests as having malaria, by background characteristics, Nigeria 2010

Background characteristic	Malaria prevalence			
	RDT positive	Number of children tested	Microscopy positive	Number of children tested
Age in months				
6-11	41.5	583	29.3	583
6-8	42.3	331	28.3	330
9-11	40.4	252	30.5	253
12-17	46.6	673	35.9	672
18-23	47.8	431	37.6	432
24-35	50.7	1,080	41.2	1,077
36-47	54.1	1,156	46.3	1,155
48-59	58.2	1,293	49.0	1,293
Child's sex				
Male	51.7	2,631	42.2	2,632
Female	51.3	2,585	41.8	2,579
Residence				
Urban	36.5	1,189	22.5	1,191
Rural	55.9	4,027	47.7	4,020
Zone				
North Central	45.1	856	49.4	856
North East	46.8	792	30.9	788
North West	56.0	1,627	48.2	1,630
South East	35.6	406	27.6	405
South South	53.8	820	32.2	816
South West	60.5	716	50.3	716
Areas for LLIN malaria campaigns				
World Bank Booster[1]	45.8	1,232	33.2	1,228
Others with campaigns[2]	53.7	960	48.6	957
Others with no campaigns[3]	53.1	3,024	43.4	3,027
Mother's education[4]				
No education	58.0	2,273	50.8	2,269
Primary	53.7	877	38.9	875
Secondary	36.8	1,081	28.7	1,084
More than secondary	32.9	182	13.1	182
Wealth quintile				
Lowest	57.0	1,104	49.7	1,100
Second	63.6	1,111	49.3	1,108
Middle	56.9	1,157	49.6	1,157
Fourth	44.0	987	36.4	986
Highest	30.1	857	18.7	860
Total	51.5	5,216	42.0	5,211

[1] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[2] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[3] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.
[4] For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the household.

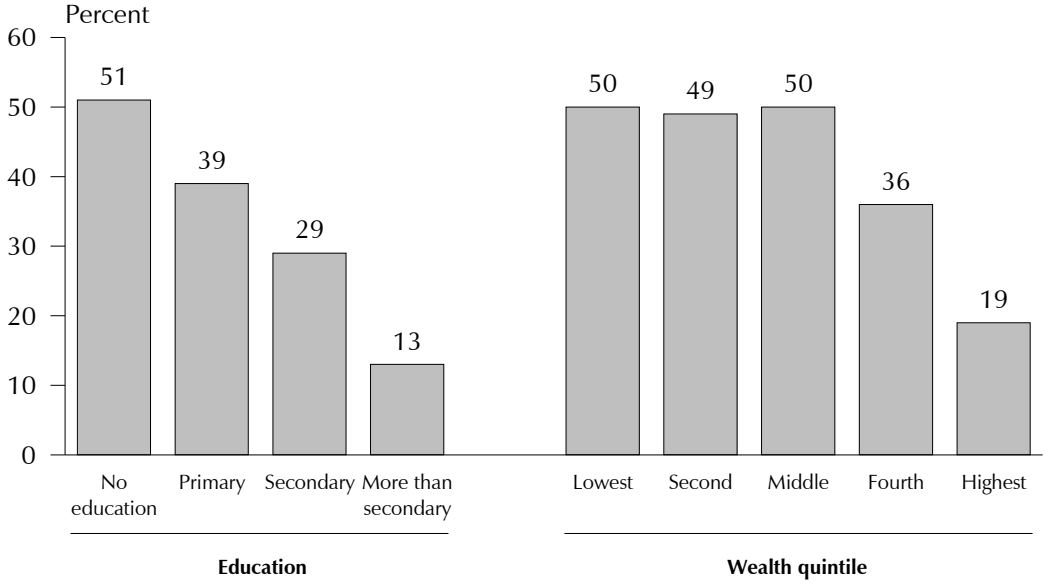
Table 6.3 shows that 42 percent of children age 6-59 months tested positive for malaria when microscopy was used for testing. Malaria prevalence increases with the age of the child regardless of the test used. Also, there is little difference in malaria prevalence by sex of the child. Prevalence of malaria is much higher in rural than in urban areas. For example, malaria prevalence using microscopy is more than twice as high in rural areas as in urban areas (48 percent versus 23 percent). Among zones, it ranges from 28 percent in South East to 50 percent in South West (Figure 6.1). Malaria prevalence decreases as the mother's education level and wealth increase (Figure 6.2).

Figure 6.1 Malaria Prevalence among Children 6-59 Months by Residence and Zone (according to Microscopy)



Nigeria 2010

Figure 6.2 Malaria Prevalence among Children 6-59 Months by Mother's Education and Wealth Quintile (according to Microscopy)



Nigeria 2010

6.1.3 Malaria Prevalence and Body Temperature among Children

Table 6.4 shows the percentage of children age 6-59 months with fever, by whether or not they have malaria as measured by RDTs and microscopy. The data show that only 11 percent of the children who tested positive for malaria using RDTs and 12 percent who tested positive using microscopy had fever at the time of the survey. These results indicate that for the majority of children, parasitaemia for malaria exists without the presence of fever. Results also show that four percent of children without malaria also have fever.

Table 6.4 Fever prevalence among children with and without malaria body temperature (axillary)

Percentage of children age 6-59 months with fever by whether or not they have malaria as measured by RDTs and microscopy, according to background characteristics, Nigeria 2010

	Based on RDT test results				Based on microscopy test results			
	Children with malaria		Children without malaria		Children with malaria		Children without malaria	
Background characteristic	Percentage with fever	Number of malaria-positive children	Percentage with fever	Number of malaria-negative children	Percentage with fever	Number of malaria-positive children	Percentage with fever	Number of malaria-negative children
Age in months								
6-11	11.5	242	7.0	341	15.0	171	6.3	412
6-8	13.5	140	9.1	191	21.5	93	6.9	236
9-11	8.6	102	4.3	150	7.2	77	5.5	176
12-17	8.7	313	4.1	360	12.4	241	2.5	431
18-23	8.6	206	0.8	225	8.3	162	2.2	270
24-35	10.9	548	4.2	533	12.4	444	4.3	633
36-47	12.0	626	3.7	530	13.4	535	3.7	619
48-59	11.1	752	3.1	541	11.9	634	3.8	659
Child's sex								
Male	10.9	1,359	3.8	1,272	12.0	1,110	4.1	1,522
Female	10.8	1,327	4.1	1,258	12.8	1,077	3.7	1,502
Residence								
Urban	4.9	434	2.9	755	6.6	268	2.7	924
Rural	12.0	2,253	4.4	1,774	13.2	1,919	4.4	2,101
Region								
North Central	13.4	386	2.7	470	10.3	423	4.6	433
North East	10.2	371	5.7	421	13.8	244	5.2	545
North West	17.7	911	7.1	716	20.5	785	6.0	845
South East	3.8	144	1.1	261	4.9	112	1.0	293
South South	4.1	441	1.0	379	4.3	263	2.0	553
South West	3.9	434	1.8	283	4.5	360	1.7	356
Areas for LLIN malaria campaigns								
World bank boosters	16.5	564	7.7	668	21.9	407	6.7	820
Others with campaigns	5.4	516	1.8	445	5.4	465	2.0	491
Others with no campaigns	10.6	1,607	2.8	1,417	11.9	1,314	3.1	1,713
Mother's education								
No education	13.5	1,319	6.6	954	14.9	1,152	6.1	1,117
Primary	6.8	471	2.8	406	7.1	340	3.6	535
Secondary	5.5	398	1.6	683	6.1	311	1.7	772
More than secondary	0.0	60	1.1	122	*	24	0.9	158
Wealth quintile								
Lowest	16.5	629	6.9	474	17.5	546	7.4	554
Second	11.7	707	6.2	404	14.6	547	4.9	562
Middle	8.9	658	3.3	499	8.8	574	4.2	583
Fourth	8.7	434	2.6	553	10.7	359	2.2	627
Highest	3.1	258	1.7	599	4.2	161	1.6	699
Total	10.8	2,687	3.9	2,530	12.4	2,187	3.9	3,024

RDT = rapid diagnostic test (malaria)
Note: Fever was measured by field teams by taking children's axillary body temperature; a temperature of 37.5° C or above was considered to constitute fever. An asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

The presence of fever is higher among children 6-8 months old, regardless of whether or not they have malaria. Rural children with malaria are more than twice as likely to have fever as urban children with malaria; however, rural children without malaria are also more likely to have fever than their urban counterparts. The Southern zones have the lowest proportions of children with fever, both among those with and without malaria, while children in North West exhibit the highest percentage with fever; 21 percent of children in North West who had malaria according to microscopy also had fever. Furthermore, the percentage of children with fever is highest among children in the World Bank Booster LLIN campaign areas, among children of uneducated mothers, and among the poorest children, regardless of whether the children have malaria.

6.1.4 Malaria Species Identification

Another objective of the 2010 NMIS was to determine the type of *Plasmodium* parasite found in children with positive thick smears. Table 6.5 shows the prevalence of each *Plasmodium* species in children age 6-59 months and the percentage with mixed infections, by background characteristics. Overall, 95 percent of infected children had *Plasmodium falciparum*, 10 percent had *P. malariae*, and 6 percent had *P. ovale*. One in ten children (10 percent) carried mixed species infections, only. Each column under the 'species of plasmodium' heading represents cases in which each species was identified, whether alone or in combination with one or more other species. In other words, the column for *P. falciparum* includes cases in which only *P. falciparum* was identified and cases in which *P. falciparum* was identified along with other species such as *P. malariae* and *P. ovale*. The percentages of children infected with each plasmodium species in the absence of other species is: 84 percent with *P. falciparum*, 3 percent with *P. malariae*, and 2 percent with *P. ovale* (data not shown*). P. vivax* was not identified in any of the cases.

Table 6.5 Malaria species

Among children age 6-59 months with malaria parasites, the percentage with specific species of plasmodium and the percentage with mixed infections, by background characteristics, Nigeria 2010

Background characteristic	Species of plasmodium			Mixed infections[4]	Number of children with malaria parasites
	P. falciparum[1]	P. malariae[2]	P. ovale[3]		
Age in months					
6-11	96.5	7.9	4.0	8.5	171
6-8	97.5	10.3	4.2	12.0	93
9-11	95.3	5.1	3.8	4.2	77
12-17	96.0	11.0	6.6	13.6	241
18-23	94.3	9.0	6.0	9.3	162
24-35	95.2	7.7	4.7	7.6	444
36-47	94.7	10.1	5.9	10.6	535
48-59	93.7	11.4	6.5	11.7	634
Child's sex					
Male	94.1	10.5	5.0	9.6	1,110
Female	95.4	9.2	6.6	11.2	1,077
Residence					
Urban	95.6	7.7	3.3	6.6	268
Rural	94.7	10.1	6.1	10.9	1,919
Zone					
North Central	95.1	9.5	12.9	17.5	423
North East	97.6	4.7	1.4	3.7	244
North West	94.3	7.4	4.4	6.1	785
South East	91.6	7.8	5.1	4.4	112
South South	90.9	13.0	6.4	10.3	263
South West	97.3	17.4	3.1	17.7	360
Areas for LLIN malaria campaigns					
World Bank Booster[5]	92.3	6.1	5.3	3.8	407
Others with campaigns[6]	95.0	8.7	7.7	11.4	465
Others with no campaigns[7]	95.4	11.4	5.2	12.1	1,314
Total	94.8	9.8	5.8	10.4	2,187

[1] Includes cases with parasites identified as *P. falciparum* or *P. falciparum* combined with other species.
[2] Includes cases with parasites identified as *P. malariae* or *P. malariae* combined with other species.
[3] Includes cases with parasites identified as *P. ovale* or *P. ovale* combined with other species.
[4] Mixed infections include cases with two or more species identified.
[5] World Bank Booster LLIN campaign states include Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers.
[6] States with other LLIN campaigns include Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto.
[7] States without LLIN campaigns at the time of the NMIS include Abia, Bayelsa, Benue, Borno, Cross Rivers, Delta, Ebonyi, Edo, Enugu, FCT, Imo, Katsina, Kogi, Kwara, Lagos, Nasarawa, Ondo, Osun, Oyo, Plateau, Taraba, Yobe, and Zamfara.

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SAMPLE IMPLEMENTATION

Appendix A

A.1 INTRODUCTION

The 2010 Nigeria Malaria Indicator Survey (NMIS) called for a nationally representative sample of about 6,000 households. The survey is designed to provide information on key malaria-related indicators including mosquito net ownership and use, coverage of preventive treatment for pregnant women, treatment of childhood fever, and the prevalence of anaemia and malaria among children age 6-59 months. The sample for the 2010 NMIS was designed to provide most of these indicators for the country as a whole, for urban and rural areas separately, and for each of the six zones formed by grouping the 36 states and the Federal Capital Territory (FCT). The zones are as follows:

1. **North Central:** Benue, FCT—Abuja, Kogi, Kwara, Nasarawa, Niger, and Plateau
2. **North East:** Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe
3. **North West:** Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara
4. **South East:** Abia, Anambra, Ebonyi, Enugu, and Imo
5. **South South:** Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers
6. **South West:** Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo

A.2 SAMPLING FRAME

The sampling frame used for the 2010 NMIS was the Population and Housing Census of the Federal Republic of Nigeria, which was conducted in 2006 by the National Population Commission (NPC). Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. In addition to these administrative units, during the 2006 Population Census, each locality was subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a *cluster* for the 2010 NMIS, is defined on the basis of EAs from the 2006 EA census frame.

Although the 2006 Population Census did not provide the number of households and population for each EA, population estimates were published for more than 800 LGA units. A combination of information from cartographic material demarcating each EA and the LGA population estimates from the census were used to identify the list of EAs, estimate the number of households, and distinguish EAs as urban or rual for the survey sample frame.

A.3 SAMPLE ALLOCATION

Table A.1 shows the sample distribution of clusters and households by zone and by urban-rural residence. The 2010 NMIS sample was selected using a stratified, two-stage cluster design consisting of 240 clusters, 83 in the urban areas and 157 in the rural areas. (The final sample included 239 clusters because access to one cluster was prevented by inter-communal disturbances.) A sample of 6,240 households was selected for the survey, with a minimum target of 920 completed individual women's interviews per zone. Within each zone, the number of households was distributed proportionately among urban and rural areas. A fixed 'take' of 26 households per cluster was adopted for both urban and rural clusters.

Table A.1 Sample allocation of clusters and households

Sample allocation of clusters and households by zone, according to residence, Nigeria 2010

	Allocation of clusters			Allocation of households		
Zone	Urban	Rural	Total	Urban	Rural	Total
North Central	13	27	40	338	702	1,040
North East	10	30	40	260	780	1,040
North West	8	32	40	208	832	1,040
South East	16	24	40	416	624	1,040
South South	11	29	40	286	754	1,040
South West	25	15	40	650	390	1,040
Nigeria	83	157	240	2,158	4,082	6,240

A.4 SAMPLING PROCEDURE AND UPDATING OF THE SAMPLING FRAME

The 2010 NMIS sample is a stratified sample selected in two stages. The primary sampling units (PSUs) are the enumeration areas (EAs) from the 2006 census, and the secondary sampling units (SSUs) are the households. In the first stage of selection, the 240 EAs were selected with a probability proportional to the size of the EA, where size is the number of approximate households calculated within the sampling frame.

A complete listing of households and a mapping exercise for each cluster was carried out from August through September 2010. The lists of households resulting from this exercise served as the sampling frame for the selection of households in the second stage. In addition to listing the households, the NPC listing enumerators used global positioning system (GPS) receivers to record the coordinates of the 2010 NMIS sample clusters.

In the second stage of the selection process, 26 households were selected in each cluster by equal probability systematic sampling. All women age 15-49 who were either permanent residents of the households in the 2010 NMIS sample or visitors present in the households on the night before the survey were eligible to be interviewed. In addition, all children age 6-59 months were eligible to be tested for malaria and anaemia.

A.5 WEIGHTING AND REPRESENTATIVENESS

Proper weighting of the survey data is important to guarantee the representativeness of the survey data and to adjust for differential nonresponse. The 2010 NMIS is a complex survey including multi-stage selection, clustering, stratification, and unequal probability sampling. Due to the non-proportional allocation of the samples to the different strata, conditions for a self-weighting sample were not met. Therefore, weights are required to ensure the representativeness of the sample results.

Several sets of weights were calculated for the NMIS. First, a set of household weights was calculated for the selected households. The basic sampling weight for each household is the inverse of its selection probability.This weight was further adjusted for nonresponse at the household level. The adjustment of the weight is performed to adjust for nonresponse of households that are found. *Out of scope* households (i.e., households absent for extended periods and households no longer extant because the dwelling is either vacant or destroyed) are not included in the calculation. Table A.2 presents the results of the household and women's interviews by residence and zone, together with the overall response rates.

The above adjusted weight was further normalized (called standard weight) at the national level to make the number of weighted cases equal to the number of unweighted cases for all household

indicators based on the whole national sample. This treatment has no effect on the indicators themselves, but it does affect the number of weighted cases to reflect the relative scale of the base population it represents. The normalization was done by multiplying the whole set of weights by a *unique constant*, which was the number of unweighted total number of households interviewed over the weighted total number of households interviewed. All household indicators are tabulated applying this set of weights.

Second, a set of women individual standard weights was calculated based on the household standard weight calculated above, correcting for women's nonresponse and normalizing the resulting weights. Women should share the same weight as that of the household to which they belong, because all women age 15-49 were interviewed in every selected household. Furthermore, the household standard weight must be corrected for women's nonresponse, because there are nonresponses at the individual level – that is, not all of the eligible women in the selected household answered the questionnaire.

The reason for normalization of the individual weight is the same as for normalization of the household weight. The household and women's weights are PSU weights. All of the households in the same cluster share the same household weights; all women in the same PSU share the same weight.

A.6 SAMPLE IMPLEMENTATION

Table A.2 presents response rates for the zones and the urban and rural areas for the household and women's survey.

Table A.2 Sample implementation

Percent distribution of households and eligible women by results of the household and individual interviews, and household, eligible women and overall women response rates, according to urban-rural residence and region (unweighted), Nigeria MIS 2010

	Residence		Region						
Result	Urban	Rural	North Central	North East	North West	South East	South South	South West	Total
Selected households									
Completed (C)	92.8	96.3	96.0	93.1	97.2	96.0	97.1	91.3	95.1
Household present but no competent respondent at home (HP)	0.7	0.3	0.0	0.5	0.1	0.9	0.3	0.8	0.4
Postponed (P)	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Refused (R)	1.1	0.7	0.8	1.5	1.2	0.5	0.5	0.6	0.8
Dwelling not found (DNF)	0.4	0.1	0.5	0.1	0.0	0.0	0.0	0.5	0.2
Household absent (HA)	4.2	2.1	2.2	4.8	0.7	2.6	1.5	5.3	2.8
Dwelling vacant/address not a dwelling (DV)	0.6	0.4	0.3	0.0	0.6	0.0	0.5	1.4	0.5
Dwelling destroy (DD)	0.1	0.1	0.2	0.0	0.2	0.0	0.1	0.0	0.1
Other (O)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	2,095	4,102	1,039	1,041	1,038	1,039	1,037	1,003	6,197
Household response rate (HRR)	97.6	98.9	98.7	97.8	98.6	98.5	99.2	98.0	98.5
Eligible women									
Completed (EWC)	97.4	97.1	98.9	96.0	95.9	96.5	98.6	97.4	97.2
Not at home (EWNH)	0.9	1.7	0.5	2.7	1.7	2.0	0.5	0.9	1.4
Postponed (EWP)	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0
Refused (EWR)	0.4	0.2	0.1	0.4	0.4	0.5	0.3	0.0	0.3
Partly completed (EWPC)	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1
Incapacitated (EWI)	0.3	0.1	0.1	0.2	0.1	0.3	0.1	0.5	0.2
Other (EWO)	0.7	0.8	0.3	0.5	1.8	0.6	0.4	1.0	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	2,143	4,384	1,091	1,132	1,256	1,048	1,140	860	6,527
Eligible women response rate (EWRR)	97.4	97.1	98.9	96.0	95.9	96.5	98.6	97.4	97.2
Overall women response rate (ORR)[3]	95.1	96.0	97.6	93.9	94.6	95.0	97.8	95.5	95.7

[1] Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as:

$$\frac{100 * C}{C + HP + P + R + DNF}$$

[2] The eligible women response rate (EWRR) is equivalent to the percentage of interviews completed (EWC)
[3] The overall women response rate (OWRR) is calculated as:
OWRR = HRR * EWRR/100

ESTIMATES OF SAMPLING ERRORS

Appendix B

The estimates from a sample survey are affected by two types of errors: (1) nonsampling errors, and (2) sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2010 Nigeria Malaria Survey (NMIS) to minimise this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2010 NMIS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

A sampling error is usually measured in terms of the *standard error* for a particular statistic (mean, percentage, etc.), which is the square root of the variance. The standard error can be used to calculate confidence intervals within which the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that statistic will fall within a range of plus or minus two times the standard error of that statistic in 95 percent of all possible samples of identical size and design.

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 2010 NMIS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulae. The computer software used to calculate sampling errors for the 2010 NMIS is the ISSA Sampling Error Module. This module used the Taylor linearisation method of variance estimation for survey estimates that are means or proportions. The Jackknife repeated replication method is used for variance estimation of more complex statistics such as fertility and mortality rates.

The Taylor linearisation method treats any percentage or average as a ratio estimate, $r = y/x$, where y represents the total sample value for variable y, and x represents the total number of cases in the group or subgroup under consideration. The variance of r is computed using the formula given below, with the standard error being the square root of the variance:

$$SE^2(r) = var(r) = \frac{1-f}{x^2}\sum_{h=1}^{H}\left[\frac{m_h}{m_{h-1}}\left(\sum_{i=1}^{m_h} z_{hi}^2 - \frac{z_h^2}{m_h}\right)\right]$$

in which

$$z_{hi} = y_{hi} - rx_{hi}\text{, and } z_h = y_h - rx_h$$

where h represents the stratum which varies from 1 to H,
m_h is the total number of clusters selected in the h^{th} stratum,
y_{hi} is the sum of the weighted values of variable y in the i^{th} cluster in the h^{th} stratum,
x_{hi} is the sum of the weighted number of cases in the i^{th} cluster in the h^{th} stratum, and
f is the overall sampling fraction, which is so small that it is ignored.

In addition to the standard error, ISSA computes the design effect (DEFT) for each estimate, which is defined as the ratio between the standard error using the given sample design and the standard error that would result if a simple random sample had been used. A DEFT value of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. ISSA also computes the relative error and confidence limits for the estimates.

Sampling errors for the 2010 NMIS are calculated for selected variables considered to be of primary interest for the woman's survey. The results are presented in this appendix for the country as a whole, for urban and rural areas, and for each of the 6 zones. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 to B.10 present the value of the statistic (R), its standard error (SE), the number of unweighted (N-UNWE) and weighted (N-WEIG) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R±2SE), for each variable. The DEFT is considered undefined when the standard error considering simple random sample is zero (when the estimate is close to 0 or 1).

The confidence interval (e.g., as calculated for *the proportion of all women 15-49 with secondary education or higher*) can be interpreted as follows: the overall proportion from the national sample is 0.405 and its standard error is 0.019. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., $0.405 \pm 2 \times 0.019$. There is a high probability (95 percent) that the *true* proportion of women with secondary education or higher for all women aged 15 to 49 is between **0.366 and 0.443**

Sampling errors are analysed for the national woman sample and a group of estimated proportions. The relative standard errors (SE/R) for the selected proportions range between almost 2 percent and 10 percent. But in general, the relative standard error for most estimates for the country as a whole is small.

There are differentials in the relative standard error for the estimates of sub-populations. For example, for the variable *secondary education or higher for women aged 40-49*, the relative standard errors, as a percent of the estimated mean for the whole country, for the urban areas, and for the rural areas are 4.8 percent, 4.6 percent, and 7.0 percent, respectively.

For the total sample, the value of the design effect (DEFT), averaged over all selected variables, is 2.9326, which means that due to multi-stage clustering of the sample, the average standard error is increased by a factor of **2.9326** over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Nigeria MIS 2010

Variable	Type of Estimate	Base Population
No education	Proportion	All women 15-49
Secondary education or higher	Proportion	All women 15-49
Antenatal care from a skilled provider	Proportion	Last birth for all women 15-49 in last 5 years
Owns at least 1 insecticide-treated net (ITN)	Proportion	Households
Owns at least 1 long-lasting insecticide net (LLIN)	Proportion	Households
Children under 5 who slept under an ITN last night	Proportion	Children under five in households
Children under 5 who slept under a LLIN last night	Proportion	Children under five in households
Woman who slept under an ITN last night	Proportion	All women 15-49 in households
Woman who slept under a LLIN last night	Proportion	All women 15-49 in households
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	Proportion	Last birth for all women 15-49 in last 2 years
Child had fever in last 2 weeks	Proportion	Children under 5 in women's birth history
Children under 5 with fever who took ACT	Proportion	Children under 5 with fever in last 2 weeks
Children 6-59 months who have malaria (RDT)	Proportion	Children 6-59 months tested for malaria using rapid test
Children 6-59 months who have malaria (microscopy)	Proportion	Children 6-59 months tested for malaria using microscopy
Children 6-59 months who have anaemia	Proportion	Children 6-59 months tested for anaemia

Table B.2 Sampling errors for National sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.425	0.023	6,344	6,344	3.664	0.053	0.380	0.471
Secondary education or higher	0.405	0.019	6,344	6,344	3.146	0.048	0.366	0.443
Antenatal care from a skilled provider	0.575	0.023	3,602	3,703	2.794	0.040	0.529	0.621
Owns at least 1 insecticide-treated net (ITN)	0.415	0.022	5,895	5,895	3.478	0.054	0.371	0.460
Owns at least 1 long-lasting insecticide net (LLIN)	0.413	0.022	5,895	5,895	3.476	0.054	0.368	0.457
Children under 5 who slept under an ITN last night	0.283	0.018	6,527	6,517	3.240	0.064	0.247	0.320
Children under 5 who slept under a LLIN last night	0.282	0.018	6,527	6,517	3.239	0.064	0.246	0.318
Woman who slept under an ITN last night	0.290	0.020	6,074	6,207	3.490	0.070	0.249	0.331
Woman who slept under a LLIN last night	0.288	0.020	6,074	6,207	3.485	0.070	0.247	0.328
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.132	0.012	2,170	2,255	1.696	0.093	0.107	0.157
Child had fever in last 2 weeks	0.354	0.016	5,379	5,519	2.451	0.045	0.322	0.386
Children under 5 with fever who took ACT	0.059	0.008	1,814	1,956	1.404	0.132	0.043	0.075
Children 6-59 months who have malaria (RDT)	0.515	0.022	5,118	5,216	3.146	0.043	0.471	0.559
Children 6-59 months who have malaria (microscopy)	0.420	0.021	5,108	5,211	3.044	0.050	0.378	0.462
Children 6-59 months who have anaemia	0.716	0.014	5,045	5,146	2.236	0.020	0.688	0.744

Table B.3 Sampling errors for Urban sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.184	0.030	2,088	1,803	3.560	0.164	0.124	0.245
Secondary education or higher	0.664	0.031	2,088	1,803	2.979	0.046	0.602	0.725
Antenatal care from a skilled provider	0.758	0.036	1,007	873	2.640	0.047	0.687	0.829
Owns at least 1 insecticide-treated net (ITN)	0.331	0.033	1,944	1,720	3.082	0.100	0.265	0.396
Owns at least 1 long-lasting insecticide net (LLIN)	0.329	0.033	1,944	1,720	3.071	0.100	0.263	0.394
Children under 5 who slept under an ITN last night	0.185	0.023	2,143	1,852	2.762	0.125	0.139	0.231
Children under 5 who slept under a LLIN last night	0.184	0.023	2,143	1,852	2.763	0.126	0.138	0.231
Woman who slept under an ITN last night	0.222	0.026	1,674	1,413	2.600	0.119	0.169	0.274
Woman who slept under a LLIN last night	0.219	0.026	1,674	1,413	2.594	0.120	0.167	0.272
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.187	0.027	606	529	1.724	0.146	0.132	0.241
Child had fever in last 2 weeks	0.308	0.027	1,504	1,285	2.271	0.088	0.254	0.362
Children under 5 with fever who took ACT	0.125	0.025	449	396	1.608	0.201	0.075	0.175
Children 6-59 months who have malaria (RDT)	0.365	0.049	1,398	1,189	3.840	0.136	0.266	0.464
Children 6-59 months who have malaria (microscopy)	0.225	0.027	1,400	1,191	2.452	0.122	0.170	0.279
Children 6-59 months who have anaemia	0.653	0.026	1,379	1,180	2.022	0.040	0.601	0.705

Table B.4 Sampling errors for Rural sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.521	0.027	4,256	4,541	3.481	0.051	0.468	0.574
Secondary education or higher	0.302	0.021	4,256	4,541	2.982	0.070	0.260	0.344
Antenatal care from a skilled provider	0.518	0.028	2,595	2,830	2.808	0.053	0.463	0.573
Owns at least 1 insecticide-treated net (ITN)	0.450	0.028	3,951	4,175	3.572	0.063	0.394	0.507
Owns at least 1 long-lasting insecticide net (LLIN)	0.448	0.028	3,951	4,175	3.573	0.063	0.391	0.504
Children under 5 who slept under an ITN last night	0.322	0.023	4,384	4,665	3.300	0.072	0.276	0.369
Children under 5 who slept under a LLIN last night	0.320	0.023	4,384	4,665	3.299	0.073	0.274	0.367
Woman who slept under an ITN last night	0.310	0.025	4,400	4,794	3.656	0.082	0.259	0.361
Woman who slept under a LLIN last night	0.308	0.025	4,400	4,794	3.651	0.083	0.257	0.359
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.115	0.014	1,564	1,726	1.683	0.118	0.088	0.142
Child had fever in last 2 weeks	0.368	0.019	3,875	4,234	2.469	0.052	0.330	0.407
Children under 5 with fever who took ACT	0.042	0.007	1,365	1,560	1.318	0.170	0.028	0.057
Children 6-59 months who have malaria (RDT)	0.559	0.024	3,720	4,027	2.923	0.043	0.512	0.607
Children 6-59 months who have malaria (microscopy)	0.477	0.024	3,708	4,020	2.970	0.051	0.429	0.526
Children 6-59 months who have anaemia	0.735	0.017	3,666	3,966	2.288	0.023	0.701	0.768

Table B.5 Sampling errors for North Central sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.389	0.062	1,079	1,039	4.176	0.160	0.265	0.513
Secondary education or higher	0.381	0.047	1,079	1,039	3.198	0.124	0.286	0.475
Antenatal care from a skilled provider	0.663	0.045	616	591	2.387	0.069	0.572	0.754
Owns at least 1 insecticide-treated net (ITN)	0.321	0.054	997	951	3.630	0.167	0.213	0.428
Owns at least 1 long-lasting insecticide net (LLIN)	0.321	0.054	997	951	3.630	0.167	0.213	0.428
Children under 5 who slept under an ITN last night	0.195	0.047	1,091	1,063	3.938	0.242	0.101	0.290
Children under 5 who slept under a LLIN last night	0.195	0.047	1,091	1,063	3.938	0.242	0.101	0.290
Woman who slept under an ITN last night	0.190	0.047	991	966	3.750	0.246	0.097	0.284
Woman who slept under a LLIN last night	0.190	0.047	991	966	3.750	0.246	0.097	0.284
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.071	0.020	355	352	1.452	0.280	0.031	0.110
Child had fever in last 2 weeks	0.176	0.022	883	850	1.709	0.125	0.132	0.220
Children under 5 with fever who took ACT	0.002	0.002	163	149	0.523	1.015	0.000	0.005
Children 6-59 months who have malaria (RDT)	0.451	0.034	882	856	2.020	0.075	0.383	0.519
Children 6-59 months who have malaria (microscopy)	0.494	0.046	880	856	2.714	0.093	0.403	0.586
Children 6-59 months who have anaemia	0.560	0.051	882	857	3.030	0.091	0.458	0.661

Table B.6 Sampling errors for North East sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.747	0.053	1,087	951	3.983	0.070	0.642	0.852
Secondary education or higher	0.172	0.042	1,087	951	3.638	0.242	0.088	0.255
Antenatal care from a skilled provider	0.311	0.051	685	607	2.882	0.164	0.209	0.413
Owns at least 1 insecticide-treated net (ITN)	0.629	0.050	969	858	3.189	0.079	0.530	0.728
Owns at least 1 long-lasting insecticide net (LLIN)	0.618	0.050	969	858	3.203	0.081	0.518	0.718
Children under 5 who slept under an ITN last night	0.515	0.053	1,132	976	3.563	0.103	0.409	0.620
Children under 5 who slept under a LLIN last night	0.507	0.053	1,132	976	3.557	0.104	0.401	0.613
Woman who slept under an ITN last night	0.515	0.045	1,113	960	2.998	0.087	0.425	0.605
Woman who slept under a LLIN last night	0.505	0.045	1,113	960	3.027	0.090	0.414	0.596
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.106	0.022	411	366	1.459	0.210	0.061	0.150
Child had fever in last 2 weeks	0.332	0.032	999	880	2.175	0.098	0.267	0.396
Children under 5 with fever who took ACT	0.041	0.018	297	292	1.570	0.442	0.005	0.077
Children 6-59 months who have malaria (RDT)	0.468	0.061	906	792	3.648	0.129	0.347	0.589
Children 6-59 months who have malaria (microscopy)	0.309	0.039	902	788	2.555	0.127	0.230	0.388
Children 6-59 months who have anaemia	0.635	0.025	903	789	1.549	0.039	0.586	0.685

Table B.7 Sampling errors for North West sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.799	0.039	1,205	1,584	3.400	0.049	0.720	0.877
Secondary education or higher	0.122	0.033	1,205	1,584	3.552	0.275	0.055	0.189
Antenatal care from a skilled provider	0.380	0.048	866	1,144	2.924	0.127	0.284	0.477
Owns at least 1 insecticide-treated net (ITN)	0.582	0.055	1,009	1,296	3.522	0.094	0.473	0.692
Owns at least 1 long-lasting insecticide net (LLIN)	0.582	0.055	1,009	1,296	3.522	0.094	0.473	0.692
Children under 5 who slept under an ITN last night	0.415	0.049	1,256	1,628	3.547	0.119	0.316	0.513
Children under 5 who slept under a LLIN last night	0.415	0.049	1,256	1,628	3.547	0.119	0.316	0.513
Woman who slept under an ITN last night	0.366	0.053	1,525	2,006	4.271	0.144	0.260	0.471
Woman who slept under a LLIN last night	0.366	0.053	1,525	2,006	4.271	0.144	0.260	0.471
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.135	0.027	511	692	1.767	0.198	0.082	0.189
Child had fever in last 2 weeks	0.493	0.034	1,341	1,777	2.513	0.070	0.424	0.561
Children under 5 with fever who took ACT	0.048	0.011	647	875	1.299	0.229	0.026	0.069
Children 6-59 months who have malaria (RDT)	0.560	0.043	1,255	1,627	3.071	0.077	0.474	0.646
Children 6-59 months who have malaria (microscopy)	0.482	0.045	1,257	1,630	3.220	0.094	0.391	0.573
Children 6-59 months who have anaemia	0.783	0.027	1,178	1,553	2.236	0.034	0.729	0.837

Table B.8 Sampling errors for South East sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.032	0.008	1,011	681	1.428	0.249	0.016	0.047
Secondary education or higher	0.749	0.029	1,011	681	2.143	0.039	0.691	0.808
Antenatal care from a skilled provider	0.928	0.015	421	274	1.201	0.016	0.898	0.959
Owns at least 1 insecticide-treated net (ITN)	0.322	0.046	997	678	3.127	0.144	0.230	0.415
Owns at least 1 long-lasting insecticide net (LLIN)	0.321	0.046	997	678	3.106	0.143	0.229	0.413
Children under 5 who slept under an ITN last night	0.142	0.026	1,048	700	2.437	0.185	0.089	0.194
Children under 5 who slept under a LLIN last night	0.140	0.026	1,048	700	2.438	0.187	0.088	0.193
Woman who slept under an ITN last night	0.169	0.029	779	502	2.185	0.174	0.110	0.227
Woman who slept under a LLIN last night	0.162	0.028	779	502	2.128	0.173	0.106	0.219
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.131	0.031	271	177	1.534	0.241	0.068	0.194
Child had fever in last 2 weeks	0.365	0.029	685	446	1.572	0.079	0.307	0.423
Children under 5 with fever who took ACT	0.071	0.019	249	163	1.182	0.272	0.032	0.109
Children 6-59 months who have malaria (RDT)	0.356	0.030	635	406	1.591	0.085	0.295	0.416
Children 6-59 months who have malaria (microscopy)	0.276	0.027	634	405	1.528	0.098	0.222	0.331
Children 6-59 months who have anaemia	0.717	0.018	640	410	1.026	0.026	0.680	0.753

Table B.9 Sampling errors for South South sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.073	0.016	1,124	959	2.049	0.218	0.041	0.105
Secondary education or higher	0.654	0.030	1,124	959	2.117	0.046	0.593	0.714
Antenatal care from a skilled provider	0.736	0.043	629	530	2.458	0.059	0.649	0.822
Owns at least 1 insecticide-treated net (ITN)	0.438	0.044	1,007	859	2.819	0.101	0.350	0.526
Owns at least 1 long-lasting insecticide net (LLIN)	0.435	0.044	1,007	859	2.815	0.101	0.347	0.523
Children under 5 who slept under an ITN last night	0.246	0.034	1,140	983	2.645	0.137	0.179	0.314
Children under 5 who slept under a LLIN last night	0.244	0.034	1,140	983	2.651	0.138	0.177	0.312
Woman who slept under an ITN last night	0.259	0.030	1,052	895	2.209	0.115	0.200	0.319
Woman who slept under a LLIN last night	0.258	0.030	1,052	895	2.212	0.116	0.198	0.318
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.204	0.034	379	313	1.663	0.169	0.135	0.273
Child had fever in last 2 weeks	0.385	0.027	909	759	1.689	0.071	0.330	0.439
Children under 5 with fever who took ACT	0.115	0.026	342	292	1.518	0.228	0.063	0.168
Children 6-59 months who have malaria (RDT)	0.538	0.049	960	820	3.054	0.091	0.440	0.636
Children 6-59 months who have malaria (microscopy)	0.322	0.036	954	816	2.355	0.111	0.251	0.394
Children 6-59 months who have anaemia	0.819	0.019	960	820	1.498	0.023	0.782	0.857

Table B.10 Sampling errors for South West sample, Nigeria MIS 2010

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.202	0.089	838	1,130	6.428	0.441	0.024	0.381
Secondary education or higher	0.600	0.080	838	1,130	4.750	0.134	0.439	0.761
Antenatal care from a skilled provider	0.840	0.040	385	557	2.126	0.047	0.760	0.920
Owns at least 1 insecticide-treated net (ITN)	0.203	0.055	916	1,253	4.168	0.273	0.092	0.314
Owns at least 1 long-lasting insecticide net (LLIN)	0.202	0.055	916	1,253	4.179	0.275	0.091	0.312
Children under 5 who slept under an ITN last night	0.103	0.042	860	1,167	4.030	0.406	0.019	0.186
Children under 5 who slept under a LLIN last night	0.103	0.042	860	1,167	4.030	0.406	0.019	0.186
Woman who slept under an ITN last night	0.081	0.030	614	879	2.695	0.366	0.022	0.141
Woman who slept under a LLIN last night	0.081	0.030	614	879	2.695	0.366	0.022	0.141
Received 2+ doses of SP/Fansidar with at least 1 dose during ANC visit	0.151	0.034	243	355	1.468	0.224	0.083	0.218
Child had fever in last 2 weeks	0.229	0.027	562	807	1.537	0.119	0.174	0.283
Children under 5 with fever who took ACT	0.089	0.035	116	185	1.312	0.392	0.019	0.159
Children 6-59 months who have malaria (RDT)	0.605	0.066	480	716	2.948	0.109	0.474	0.737
Children 6-59 months who have malaria (microscopy)	0.503	0.054	481	716	2.359	0.107	0.395	0.610
Children 6-59 months who have anaemia	0.728	0.028	482	717	1.367	0.038	0.673	0.784

DATA QUALITY TABLES

Appendix C

Table C.1 Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Nigeria MIS 2010

	Women		Men			Women		Men	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	583	3.8	592	3.9	38	134	0.9	150	1.0
1	569	3.7	587	3.9	39	84	0.6	79	0.5
2	547	3.6	639	4.2	40	294	1.9	320	2.1
3	641	4.2	621	4.1	41	84	0.6	70	0.5
4	732	4.8	696	4.6	42	104	0.7	115	0.8
5	403	2.6	447	2.9	43	76	0.5	78	0.5
6	556	3.6	582	3.8	44	40	0.3	25	0.2
7	474	3.1	529	3.5	45	202	1.3	236	1.6
8	489	3.2	520	3.4	46	75	0.5	81	0.5
9	329	2.2	362	2.4	47	64	0.4	74	0.5
10	473	3.1	533	3.5	48	86	0.6	89	0.6
11	246	1.6	272	1.8	49	42	0.3	59	0.4
12	459	3.0	426	2.8	50	238	1.6	265	1.8
13	289	1.9	321	2.1	51	63	0.4	33	0.2
14	337	2.2	282	1.9	52	110	0.7	76	0.5
15	247	1.6	409	2.7	53	70	0.5	63	0.4
16	220	1.4	257	1.7	54	57	0.4	42	0.3
17	215	1.4	201	1.3	55	139	0.9	133	0.9
18	279	1.8	332	2.2	56	43	0.3	56	0.4
19	174	1.1	170	1.1	57	34	0.2	53	0.4
20	441	2.9	337	2.2	58	43	0.3	47	0.3
21	190	1.2	131	0.9	59	15	0.1	24	0.2
22	229	1.5	209	1.4	60	196	1.3	217	1.4
23	188	1.2	132	0.9	61	16	0.1	23	0.2
24	177	1.2	104	0.7	62	53	0.3	41	0.3
25	456	3.0	325	2.1	63	27	0.2	30	0.2
26	185	1.2	129	0.9	64	11	0.1	22	0.1
27	216	1.4	147	1.0	65	90	0.6	123	0.8
28	286	1.9	198	1.3	66	15	0.1	23	0.2
29	152	1.0	93	0.6	67	8	0.0	24	0.2
30	449	2.9	374	2.5	68	41	0.3	33	0.2
31	103	0.7	103	0.7	69	5	0.0	12	0.1
32	200	1.3	191	1.3	70+	310	2.0	484	3.2
33	124	0.8	89	0.6	Don't know/ missing	8	0.1	13	0.1
34	110	0.7	74	0.5					
35	351	2.3	325	2.1					
36	111	0.7	92	0.6	Total	15,236	100.0	15,150	100.0
37	130	0.9	102	0.7					

Table C.2 Age distribution of eligible and interviewed women

De facto household population of women age 10-54, interviewed women age 15-49, and percentage of eligible women who were interviewed (weighted), by five-year age groups, Nigeria MIS 2010

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percent	
10-14	1,803	na	na	na
15-19	1,136	1,076	17.0	94.7
20-24	1,225	1,187	18.8	96.9
25-29	1,294	1,266	20.0	97.8
30-34	985	964	15.2	97.8
35-39	811	783	12.4	96.5
40-44	597	589	9.3	98.6
45-49	468	456	7.2	97.4
50-54	539	na	na	na
15-49	6,517	6,320	100.0	97.0

Note: The de facto population includes all residents and nonresidents who stayed in the household the night before the interview. Weights for both household population of women and interviewed women are household weights. Age is based on the household schedule.
na = Not applicable

PERSONS INVOLVED WITH THE 2010 NIGERIA MALARIA INDICATOR SURVEY (NMIS)

Appendix D

2010 Nigeria Malaria Indicator Survey Management Committee (SMC)

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Chiomah Amajoh	Integrated Vector Management (NMCP)	
Adeosun F.	Monitoring and Evaluation (NMCP)	
Pharm. (MRS) Chukwumah	Procurement Supply Chain Management (NMCP)	
Felicia Ewoigbokhan	Advocacy, Communication and Social Mobilization (NMCP)	
Dr. Godwin Ntadom	Case Management (NMCP)	
Sani Ali Gar	National Population Commission (NPC)	Project Director
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Dr. Belay Kassa	USAID	
Adrienne Cox	ICF International	
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Dr. Cephas Ityonguzhul	World Health Organization (WHO)	
Adamu Sallau	The Carter Center (TCC)	
Dr. Kolawole Maxwell	Support for National Malaria Control Programme (SUNMAP)	
Dr. Olusola Oresanya	National Malaria Control Programme (NMCP)	Secretary

Survey Implementation Committee (SIC)

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Dr. Oresanya Olusola	NMCP	Vice Chairman
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Margaret Edet	NPC	
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Onuorah Innocent	NPC	Trainer
Idris B. Mairuwa	NPC	Trainer
Dr. Abimbola Gbenga Olayemi	NMCP	Trainer
Samsom Olajide Banjo	NMCP	Trainer
Dr. Samsom Adebayo	SFH	Trainer
Ekundayo Arogunde	SFH	Trainer
Deborah Sesugh Mker	NMCP	Trainer
F. Adeosun	NMCP	M&E
F. Okoh	NMCP	M&E
Folawumi A. Agbomola	NMCP	M&E
Omo-Eboh Mamudu	NMCP	M&E
James Ujor	NMCP	M&E
Musa Erena	NPC	Secretary
Vero Mordi	NPC	Secretary
Yemisi Peters	NPC	Secretary
Tolulope Adeshakin	NMCP	Secretary
L. Yat	NMCP	Secretary
Tony Ugba	NMCP	Secretary
Ohioma	NMCP	Secretary
Johnson	NMCP	Driver
Mr Lawrence Alabi	NMCP	Driver
Mumini Alao	NPC	Driver
James Eborka	NPC	Driver

Fieldwork/Data Collection

Sani Ali Gar	Project Director	General Oversight
Inuwa B. Jalingo	Project Coordinator	General Oversight/North East Teams
Dr. Oresanya Olusola	Vice Chair	General Oversight
Margaret Edet	SIC	South South Teams
Ezenwa Nwamaka L.	SIC	South East Teams
Onuorah Innocent	SIC	North Central Teams
Idris B. Mairuwa	SIC	North West Teams
Dr. Abimbola Gbenga Olayemi	SIC	South West Teams
Samsom Olajide Banjo	SIC	General Oversight Lab Issues
Dr. Samsom Adebayo	SIC	SFH
Ekundayo Arogunde	SIC	SFH

Fieldwork Teams 1, 2, and 3

	Innocent Onuorah	**Coordinator**
Ayuku Sumba	North Central Team 1	Supervisor
Ayodele Justina Olubusayo	North Central Team 1	Nurse
Zuokumor Benedicta	North Central Team 1	Lab Scientist
Idris Fadimatu Idris	North Central Team 1	Interviewer
Suleiman Usman	North Central Team 1	Interviewer
Onuminya Ojobi Sheena	North Central Team 2	Supervisor
Roselyn N. Bako	North Central Team 2	Nurse
Ossai Martina C.	North Central Team 2	Lab Scientist
Joyce Kadiri	North Central Team 2	Interviewer
Ugbaha Sunday	North Central Team 2	Interviewer

Mohammed Suleman	North Central Team 3	Supervisor
Luka Naomi	North Central Team 3	Nurse
Moyosore Bolanle	North Central Team 3	Lab Scientist
Eniola Afuye Margaret	North Central Team 3	Interviewer
Mohammed Salihu	North Central Team 3	Interviewer

Fieldwork Teams 4 and 5

	Inuwa B. Jalingo	**Coordinator**
Hudu Babale Tilde	North East Team 4	Supervisor
Hafsat A. Barau	North East Team 4	Nurse
Akazi Ugochukwu N.	North East Team 4	Lab Scientist
Sani Usman	North East Team 4	Interviewer
Afilia Esthon	North East Team 4	Interviewer
Bukar Umar	North East Team 5	Supervisor
Habiba Abdullahi	North East Team 5	Nurse
Shuaibu Umaru Sule	North East Team 5	Lab Scientist
Hadiza Ibrahim	North East Team 5	Interviewer
Bukar Mohammed Isyaku	North East Team 5	Interviewer

Fieldwork Teams 6, 7, and 8

	Bala Mairuwa	**Coordinator**
Musa Sani Zakirai	North West Team 6	Supervisor
Talatu Musa Abba	North West Team 6	Nurse
Shagaya Ishaya J.	North West Team 6	Lab Scientist
Aisha Abubakar Bello	North West Team 6	Interviewer
Nasiru Sani Salisu	North West Team 6	Interviewer
Lawal M. Kurfi	North West Team 7	Supervisor
Saude Sagir	North West Team 7	Nurse
Michael Agbo	North West Team 7	Lab Scientist
Hauwa Musa	North West Team 7	Interviewer
Sambo Y. Abba	North West Team 7	Interviewer
Umar Kangiwa	North West Team 8	Supervisor
Chinasa Doris Okereke	North West Team 8	Nurse
Omoregbee Wilfred Iziegbe	North West Team 8	Lab Scientist
Yemisi Imoru Daramola	North West Team 8	Interviewer
Mustapha M. Galadima	North West Team 8	Interviewer

Fieldwork Teams 9 and 10

	Ezenwa Amaka	**Coordinator**
Nweke Izza Innocent	South East Team 9	Supervisor
Nkechinyere Azubuike	South East Team 9	Nurse
Idume Ogbonna Nwachi	South East Team 9	Lab Scientist
Ernest Ugorji C.	South East Team 9	Interviewer
Rose Okeke	South East Team 9	Interviewer
Onwunka Patrick A.	South East Team 10	Supervisor
Ani Ugoihi E.	South East Team 10	Nurse
Eze Ukpai Agwu	South East Team 10	Lab Scientist
Okonkwo Happiness E.	South East Team 10	Interviewer
Nwanguma Cyril	South East Team 10	Interviewer

Fieldwork Teams 11 and 12

	Dr. Abimbola Gbenga Olayemi	**Coordinator**
Ayodele George	South West Team 11	Supervisor
Sanni Olabisi A.	South West Team 11	Nurse
Kolawole Ibukun	South West Team 11	Lab Scientist
Gbenga Olayomi	South West Team 11	Interviewer
Omolade Folasade M.	South West Team 11	Interviewer
Kolade Oludare	South West Team 12	Supervisor
Oni Felix Oluwaseun	South West Team 12	Nurse
Ojaoba Abiola Grace	South West Team 12	Lab Scientist
Abike B. Olabode	South West Team 12	Interviewer
Adetokunbo Adetutu	South West Team 12	Interviewer

Fieldwork Teams 13, 14, and 15

	Margaret Edet	**Coordinator**
Nyeke Miamon W.	South South Team 13	Supervisor
Adonkie Amaebi	South South Team 13	Interviewer
Idiami A.W. Odu	South South Team 13	Interviewer
Beinmonyo Marian Walter	South South Team 13	Nurse
Kanu Onyekachi E.	South South Team 13	Lab Scientist
Asibong Ibe Udeme	South South Team 14	Supervisor
Stella Ogar Anya	South South Team 14	Interviewer
Effiong Etta Bassey	South South Team 14	Interviewer
Chukwu Franca	South South Team 14	Nurse
Emem Monday Henry	South South Team 14	Lab Scientist
Ojo G.O.	South South Team 15	Supervisor
Okwara Nneka Nonye	South South Team 15	Interviewer
Iduma Agnes Ikpeghe	South South Team 15	Interviewer
Arubi Stella Okiemute	South South Team 15	Nurse
Stephen Nnenna	South South Team 15	Lab Scientist

Quality Control Team/Reserves

Nasiru Oziohu Grace	North Central	Quality Control Interviewer
Nneka P. Njoku	South East	Quality Control Interviewer
Matilda Ojong Arrey	South South	Quality Control Interviewer
Maryam Mahmoud	North West	Quality Control Interviewer
Adesida Janet Bola	South West	Quality Control Interviewer
Abbas Audi Kyaya	North East	Quality Control Interviewer
Ewuosho F.O.		Reserve Lab Scientist
Folorunso T.K.		Reserve Interviewer
Okwor Blessing N.		Reserve Interviewer
Agnes Fwangchi		Reserve Nurse
Obanor Juliana		Reserve Interviewer

Fieldwork Drivers

Mani Umaru	NW Zonal Logistics/Movement of Slides	Driver
Musa Isa	Fieldwork KT/KD Team	Driver
Danladi Yusuf	Fieldwork KN/JG Team	Driver
Abubakar Sadiq	Fieldwork KB/SOK/ZAM Team	Driver
Bala Maidawa	Fieldwork NE Bauchi, Gombe and Taraba	Driver
Saliu Sunday Siaka	Fieldwork NC Benue and Kogi	Driver
Effiong T. Udoh	Fieldwork SS Akwa Ibom and Cross Rivers	Driver
Yakubu Ibrahim	Fieldwork Kwara/Niger	Driver

Ahmadu Yakubu	NE Zonal Logistics/Movement of Slides	Driver
Adeeyanju Israel Adeniyi	Fieldwork SW Ogun and Lagos	Driver
Adewale Adesulu	Fieldwork SW Ondo Ekiti and Osun	Driver
Bayo Oluwo	SW Zonal Logistics/Movement of Slides	Driver
Paschal Irom Agbor	Fieldwork SS Bayelsa and Rivers	Driver
Isa Ibrahim Usman	Fieldwork NE Borno, Yobe and Adamawa	Driver
Sunday Olukoye	Biomarker Field Monitoring	Driver
Mumini Alao	Field Monitoring	Driver
James Eborka	Field Monitoring	Driver
Ademoyero Shieola Awokoya	Field Monitoring	Driver
Abdullahi Sani	Field Monitoring	Driver
Abdulahi Dambazau	Field Monitoring	Driver
Lambert Ezeala	Field Monitoring	Driver
David Dada	Field Monitoring	Driver
Sunday Adekoya	Field Monitoring	Driver
Lawrence Alabi	Field Monitoring	Driver
Aruwa Chimezi	Fieldwork SE Team Imo/Abia	Driver
Cyprian Okeke	Fieldwork SE Team Enugu/Anambra/Ebonyi	Driver

Slide Logistics Team

Deborah Sesugh Mker	Central Lab (Receiving Officer)	Lab Scientist
Bello Isah	North West	Lab Scientist
Akindele Samuel	South West	Lab Scientist
Agwuble Ugenyi E.	South South	Lab Scientist
Miracle Ngozi Nwafor	North Central	Lab Scientist
Nebo Michael	South West	Lab Scientist
Alkassim Dalhatu	North East	Lab Scientist

Fieldwork Monitoring

Dr. Babajide Coker	Lagos	Monitor
Ayo Ojomu	Lagos	Monitor
F. Okoh	Ogun	Monitor
Adelusi Sunday	Ogun	Monitor
Pharm. (MRS) Chukwumah	Ondo	Monitor
Abel Ajeigbe	Osun	Monitor
Samson Olajide Banjo	Osun	Monitor
Aro Modiu	Oyo	Monitor
Adebeshin	Ekiti	Monitor
Dr. Adebayo S. (SFH)	Ekiti	Monitor
Margret Lediju	Benue	Monitor
Tunde Ipaye	FCT	Monitor
F. Adeosun	Kogi	Monitor
Dr. David Durojaiye	Kwara	Monitor
Dr. Ronke Agbaje (IHVN)	Kwara	Monitor
Pharm. Olusola Idowu	Nasarawa	Monitor
Kunmi Kolade	Nasarawa	Monitor
Adedapo Adewumi	Nasarawa	Monitor
Felicia Ewoigbokhan	Niger	Monitor
Dawaba Mercy	Niger	Monitor
Dr. Omede O.	Plateau	Monitor
Abdulsalaam C.	Plateau	Monitor
Dr. Zainab Onotu	Adamawa	Monitor
Musa Abubakar (SFH)	Adamawa	Monitor
Joshua Olatunji (ARFH)	Bauchi	Monitor
Dr. Audu B.M.	Borno	Monitor
Fati Murtala-Ibrahim	Gombe	Monitor

Rosemary Obiorah	Gombe	Monitor
Jonah Ladi	Yobe	Monitor
Musa Abubakar (SFH)	Yobe	Monitor
Yemisi Ogunbiyi	Jigawa	Monitor
Tim Obot	Kaduna	Monitor
Ronke Agbaje	Kano	Monitor
Yussuf Danjuma	Katsina	Monitor
Donarld Ordu	Kebbi	Monitor
Dr. Femi Ajumobi	Sokoto	Monitor
Chagbe Stephanie	Zamfara	Monitor
Ifeanyi Okorafor	Abia	Monitor
Promise Udoh	Anambra	Monitor
Emma Onyefunofua	Ebonyi	Monitor
Dr. Ntadom	Enugu	Monitor
Dr. Elikwu	Imo	Monitor
Onnoghen	Akwa Ibom	Monitor
Dr. Uwem Inyang (SFH)	Akwa Ibom	Monitor
James Ujor	Bayelsa	Monitor
Awoyo Abimbola	Bayelsa	Monitor
Chioma Amajoh	Cross River	Monitor
Deborah Dyeris	Cross River	Monitor
R.N. Semlek	Delta	Monitor
Ope Abegunde	Delta	Monitor
Mamudu Omo-Eboh	Edo	Monitor
Asehinde Oreoluwa	Rivers	Monitor
Ekundayo Arogundade (SFH)	Rivers	Monitor

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Elias E.O. (MRS)	Archivist
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Micheal Bello	Data Entry Operator
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Ferdinand Ishorkor	Data Entry Operator
Ayodeji Aluko	Data Entry Operator

Household Listing Teams

Chike N. Moronu	North East	Trainer
Ologun Olusegun Raphael	North Central	Trainer
Ibrahim Hamisu Sale	South West	Trainer
Jude Ezeoke	South East	Trainer
Tellson Osifo Ojogun	South South	Trainer
Fasiku A. David	North West	Trainer
Mohammed Musa Abubakar	North Central	Supervisor
Ahmed A. Kumo	North East	Supervisor
Kassim Muhammad	North West	Supervisor
Onyia Ngozi Ethel	South East	Supervisor
Bassey Eteng	South South	Supervisor
Abubakar Bello Afegbua	South West	Supervisor
Alaba S.A.	South West	Lister
Bassey Brendan Effiong	South West	Lister
Joy Uwadia	South West	Lister
Sodipo Babatunde	South West	Lister
Apanisile M Olubodun	South West	Lister
Ogungbade J.A.	South West	Lister
Fasipe Folarin	South West	Lister
Isong Udo Udo	South South	Lister
Gabriel Coker	South South	Lister
Egbivwie Ernest Ese	South South	Lister
James Isibor	South South	Lister
Owan Kennet Enoh	South South	Lister
Mike Attah	South South	Lister
Aganaba Womoemi	South South	Lister
Alfred Tunde Yoyo	South South	Lister
Onwueyi Fyne	South East	Lister
Emma Nwakile	South East	Lister
Chima Glory	South East	Lister
Ugwu Brendan	South East	Lister
Uwadi Samuel N.	South East	Lister
Igboanusi Chibuzor Jay	South East	Lister
Anuforo Vitus	South East	Lister
Sani Saidu	North West	Lister
Musbahu Bawa	North West	Lister
Abdullahi Muhd Inuwa	North West	Lister
Shehu Abdullahi	North West	Lister
Abdullahi B Danfulani	North West	Lister
Magaji Aliyu Kardi	North West	Lister
Yahaya Yanusa Kigo	North West	Lister
Suleiman A. Yusuf	North West	Lister
Ibrahim Maje Pijjani	North West	Lister
Abubakar Jibrin	North West	Lister
Dalatu Solomon	North East	Lister
Ibrahim A. Tudu	North East	Lister
Musa Umar Mohd	North East	Lister
Mohammed A. Milala	North East	Lister
Ahidjo Adamu Sabuda	North East	Lister
Danjuma V. Mto	North East	Lister
Betene Ishaku	North East	Lister
Mohammed Isa	North East	Lister
Adedoyin Adetayo	North Central	Lister
Thomas Anhange	North Central	Lister
Mohammed Salihu	North Central	Lister

Usman Haruna Eneye	North Central	Lister
Okereke Mathew A.	North Central	Lister
Vero Mordi	North Central	Lister
Jimoh O. Aliu	North Central	Lister
Yahaya Olusola Gegele	North Central	Lister
Dasplang Sunday	North Central	Lister
Ibrahim Garba Gbage	North Central	Lister
Umar Shehu Usman	North Central	Lister
Akanbi Olalekan Dauad	North Central	Lister
Ismaila Ahmed	North Central	Lister
Sani Ali Gar	North Central	Monitor
Inuwa B. Jalingo	North East	Monitor
Dr. Oresanya Olusola	South West	Monitor

ICF International Staff

Adrienne Cox	Survey Specialist/Country Manager
Alfredo Aliaga	Sampling Statistician
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Nancy Johnson	Senior Editor
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Kia Reinis	Data Quality Coordinator/Report Reviewer
Barbara Yang	Biomarker Supplies Procurement Coordinator
Sam Nsobya Lubwama	Laboratory Expert

QUESTIONNAIRES

Appendix **E**

29 September 2010

C O N F I D E N T I A L

NIGERIA MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

NATIONAL POPULATION COMMISSION
NATIONAL MALARIA CONTROL PROGRAM

National Health Research Ethics Committee
Assigned Number NHREC/01/01/2007 - 10/09/2010b

IDENTIFICATION

STATE _____ .....

LOCAL GOVT. AREA _____ .....

LOCALITY _____

ENUMERATION AREA _____ .....

URBAN/RURAL (URBAN=1, RURAL=2) _____ .....

CLUSTER NUMBER .....

BUILDING NUMBER .....

HOUSEHOLD HEAD NAME/NUMBER _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2010)
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER 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

TOTAL ELIGIBLE CHILDREN AGE 0-5 YEARS

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** — 4

LANGUAGE OF INTERVIEW** .....

NATIVE LANGUAGE OF RESPONDENT** .....

TRANSLATOR USED (1=NOT AT ALL; 2=SOMETIME; 3=ALL THE TIME) .....

**LANGUAGE CODES: 1 HAUSA 2 YORUBA 3 IGBO 4 ENGLISH 6 OTHER _____ (SPECIFY)

SUPERVISOR/EDITOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

Introduction and Consent

Greetings. My name is _____ and I am working with National Population Commission. We are conducting a national survey that asks women and men about various health issues. This study has been reviewed and granted approval by the National Health Research Ethics Committee, assigned number NHREC/01/01/2007, for the study period of September 2010 to September 2011. We would very much appreciate your participation in this survey. This information will help the government to plan health services. The survey usually takes between 20 and 30 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. Should you have any questions, feel free to call any of the following contact person(s):

2010 NMIS Contact Person, NPC: Project Director; **Email:** saligar58@yahoo.com; **Phone**: 08033708114
NMCP Contact Person: National Coordinator; **Email:** jide_coker1@yahoo.com; **Phone:** 08037860784
NHREC Contact Person(s): Secretary, NHREC; **Email:** secretary@nhrec.net; **Phone:** 08033143791
Desk Officer, NHREC; **Email:** deskofficer@nhrec.net; **Phone:** 08065479926

As part of the survey we would first like to ask some questions about your household. All of the answers you give will be confidential. As part of this survey, we are asking that children all over the country take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or disease. This survey will help the government to develop programs to prevent and treat anemia. As part of this survey, we are asking that children all over the country take a test to see if they have malaria. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. If the malaria test is positive, treatment will be offered. This survey will help the government to develop programs to prevent malaria. Participation in the survey is completely voluntary. If we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. However, we hope you will participate in the 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?

Signature of interviewer: _____ Date: _____

Signature/thumb print of respondent: _____ Date: _____

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

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELA-TION-SHIP	SEX	RESIDENCE		AGE	WOMEN AGE 15-49		CHILD-REN 0- 5
	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. AFTER LISTING THE NAMES, RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-14 FOR EACH PERSON.	What is the relation-ship of (NAME) to the head of the house-hold? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old was (NAME) at his/her last birthday?	CIRCLE LINE NUM-BER OF ALL WOMEN AGE 15-49 YEARS	Is (NAME) currently pregnant?	CIRCLE LINE NUM-BER OF ALL CHILD-REN AGE 0-5 YEARS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01			M F 1 2	YES NO 1 2	YES NO 1 2	IN YEARS	01	YES NO/DK 1 2	01
02			1 2	1 2	1 2		02	1 2	02
03			1 2	1 2	1 2		03	1 2	03
04			1 2	1 2	1 2		04	1 2	04
05			1 2	1 2	1 2		05	1 2	05
06			1 2	1 2	1 2		06	1 2	06
07			1 2	1 2	1 2		07	1 2	07
08			1 2	1 2	1 2		08	1 2	08
09			1 2	1 2	1 2		09	1 2	09
10			1 2	1 2	1 2		10	1 2	10

2A) Just to make sure that I have a complete listing, are there any other persons such as small children or infants that we have not listed? YES ☐ → ENTER EACH IN TABLE NO ☐

2B) Are there any other people who may not be members of your family, like domestic servants, lodgers, or friends who usually live here? YES ☐ → ENTER EACH IN TABLE NO ☐

2C) 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 ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR 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 BY BLOOD
10 = NIECE/NEPHEW BY MARRIAGE
11 = OTHER RELATIVE
12 = ADOPTED/FOSTER/STEPCHILD
13 = NOT RELATED
98 = DON'T KNOW

LINE NO.	IF AGE 5 YEARS OR OLDER		FOR EVERYONE FEVER AND TREATMENT			
	EVER ATTENDED SCHOOL		In the last 2 weeks, has (NAME) been sick with a fever at any time?	Did (NAME) get any treatment for the fever in the last 2 weeks?	Where did (NAME) first seek treat-ment? USE CODES BELOW.	How much did the treatment cost? INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 99990, WRITE '99990'. IF FREE, CIRCLE CODE '99995'.
	Has (NAME) ever attended school?	What is the highest level of school (NAME) has attended? SEE CODES BELOW. What is the highest grade (NAME) completed at that level? SEE CODES BELOW.				
	(10A)	(10B)	(11)	(12)	(13)	(14)
	Y N	CLASS/ LEVEL YEAR	Y N DK	Y N DK		NAIRA
01	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
02	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
03	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
04	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
05	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
06	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
07	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
08	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
09	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
10	1 2 GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995

CODES FOR Q. 10B: EDUCATION

EDUCATION LEVEL:
0=PRE-PRIMARY/KINDERGARTEN
1 = PRIMARY
2 = SECONDARY
3 = HIGHER
8 = DON'T KNOW

EDUCATION YEAR:
01 - 03 = YEARS AT PRE-PRIMARY/KINDERGARDEN LEVEL
01 - 06 = YEARS 1 - 6 AT PRIMARY LEVEL
01 - 06 = YEARS 1 - 6 AT SECONDARY LEVEL
01 - TOTAL NUMBER OF YEARS AT HIGHER LEVEL*
00 = LESS THAN 1 YEAR COMPLETED
98 = DON'T KNOW
***FOR "HIGHER", TOTAL THE NUMBER OF YEARS AT THE POST-SECONDARY LEVEL**

CODES FOR Q. 13: PLACE OF TREATMENT

01 = GOVERNMENT HOSPITAL
02 = GOVERNMENT HEALTH CENTER
03 = GOVERNMENT HEALTH CLINIC
04 = PRIVATE HOSPITAL/CLINIC
05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = CHEMIST/PMV
09 = SHOP
10 = TRADITIONAL PRACTITIONER
11 = ROLE MODEL CAREGIVER/ COMMUNITY WORKER
12 = DRUG HAWKER
13 = SELF TREATMENT AT HOME
96 = OTHER
98 = DOES NOT KNOW

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELA-TION-SHIP	SEX	RESIDENCE		AGE	WOMEN AGE 15-49		CHILD-REN 0- 5
	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. AFTER LISTING THE NAMES, RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-14 FOR EACH PERSON.	What is the relation-ship of (NAME) to the head of the house-hold? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old was (NAME) at his/her last birthday?	CIRCLE LINE NUM-BER OF ALL WOMEN AGE 15-49 YEARS	Is (NAME) currently pregnant?	CIRCLE LINE NUM-BER OF ALL CHILD-REN AGE 0-5 YEARS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
11			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS	11	Y N 1 2	11
12			1 2	1 2	1 2		12	1 2	12
13			1 2	1 2	1 2		13	1 2	13
14			1 2	1 2	1 2		14	1 2	14
15			1 2	1 2	1 2		15	1 2	15
16			1 2	1 2	1 2		16	1 2	16
17			1 2	1 2	1 2		17	1 2	17
18			1 2	1 2	1 2		18	1 2	18
19			1 2	1 2	1 2		19	1 2	19
20			1 2	1 2	1 2		20	1 2	20
TICK HERE IF CONTINUATION SHEET USED ☐									

2A) Just to make sure that I have a complete listing, are there any other persons such as small children or infants that we have not listed? YES ☐→ ENTER EACH IN TABLE NO ☐

2B) Are there any other people who may not be members of your family, like domestic servants, lodgers, or friends who usually live here? YES ☐→ ENTER EACH IN TABLE NO ☐

2C) 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 ☐

LINE NO.	IF AGE 5 YEARS OR OLDER		FOR EVERYONE FEVER AND TREATMENT			
	EVER ATTENDED SCHOOL		In the last 2 weeks, has (NAME) been sick with a fever at any time?	Did (NAME) get any treatment for the fever in the last 2 weeks?	Where did (NAME) first seek treat-ment? USE CODES BELOW.	How much did the treatment cost? INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 99990, WRITE '99990'. IF FREE, CIRCLE CODE '99995'.
	Has (NAME) ever attended school?	What is the highest level of school (NAME) has attended? SEE CODES BELOW. What is the highest grade (NAME) completed at that level? SEE CODES BELOW.				
(1)	(10A	(10B)	(11)	(12)	(13)	(14)
	Y N	CLASS/ LEVEL YEAR	Y N DK	Y N DK		NAIRA
11	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
12	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
13	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE		FREE 99995
14	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
15	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
16	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
17	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
18	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
19	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
20	1 2 ↓ GO TO 11		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995

CODES FOR Q. 10B: EDUCATION

EDUCATION LEVEL:
0=PRE-PRIMARY/KINDERGARTEN
1 = PRIMARY
2 = SECONDARY
3 = HIGHER
8 = DON'T KNOW

EDUCATION YEAR:
01 - 03 = YEARS AT PRE-PRIMARY/KINDERGARDEN LEVEL
01 - 06 = YEARS 1 - 6 AT PRIMARY LEVEL
01 - 06 = YEARS 1 - 6 AT SECONDARY LEVEL
01 - TOTAL NUMBER OF YEARS AT HIGHER LEVEL*
00 = LESS THAN 1 YEAR COMPLETED
98 = DON'T KNOW
***FOR "HIGHER", TOTAL THE NUMBER OF YEARS AT THE POST-SECONDARY LEVEL**

CODES FOR Q. 13: PLACE OF TREATMENT

01 = GOVERNMENT HOSPITAL
02 = GOVERNMENT HEALTH CENTER
03 = GOVERNMENT HEALTH CLINIC
04 = PRIVATE HOSPITAL/CLINIC
05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = CHEMIST/PMV
09 = SHOP
10 = TRADITIONAL PRACTITIONER
11 = ROLE MODEL CAREGIVER/ COMMUNITY WORKER
12 = DRUG HAWKER
13 = SELF TREATMENT AT HOME
96 = OTHER
98 = DOES NOT KNOW

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
15	What is the main source of drinking water for members of your household?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PUBLIC TAP/STANDPIPE . . . . . 13 TUBE WELL OR BOREHOLE . . . . . 21 **DUG WELL** HAND PUMP, 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/LAKE/STREAM 81 BOTTLED WATER . . . . . 91 WATER SACHETS (PURE WATER) . . . . . 92 OTHER _____ 96 (SPECIFY)	
16	What kind of toilet facility do members of your household usually use?	**FLUSH OR POUR FLUSH TOILET** FLUSH TO PIPED SEWER SYSTEM . 11 FLUSH TO SEPTIC TANK . . . . . 12 FLUSH TO PIT LATRINE . . . . . 13 FLUSH TO SOMEWHERE ELSE . . . . . 14 FLUSH, DON'T KNOW WHERE . . . . . 15 **PIT LATRINE** VENTILATED IMPROVED PIT LATRINE 21 PIT LATRINE WITH SLAB . . . . . 22 PIT LATRINE WITHOUT SLAB/OPEN PIT 23 COMPOSTING TOILET . . . . . 31 BUCKET TOILET . . . . . 41 HANGING TOILET/HANGING LATRINE . 51 NO FACILITY/BUSH/FIELD . . . . . 61 OTHER _____ 96 (SPECIFY)	
17	Does your household have the following items which are in good working order:		
	Electricity?	ELECTRICITY 1 2	
	A radio?	RADIO 1 2	
	A television?	TELEVISION 1 2	
	A mobile telephone?	MOBILE TELEPHONE 1 2	
	A non-mobile telephone?	NON-MOBILE TELEPHONE . 1 2	
	A refrigerator?	REFRIGERATOR 1 2	
	A cable TV ?	CABLE TV 1 2	
	A generating set ?	GENERATING SET 1 2	
	Airconditioner ?	AIR CONDITIONER 1 2	
	A computer ?	COMPUTER 1 2	
	Electric iron ?	ELECTRIC IRON 1 2	
	A fan ?	FAN 1 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
18	What type of fuel does your household mainly use for cooking?	ELECTRICITY . . . . . 01 LPG/COOKING GAS . . . . . 02 NATURAL GAS . . . . . 03 BIOGAS . . . . . 04 KEROSENE . . . . . 05 COAL, LIGNITE . . . . . 06 CHARCOAL . . . . . 07 WOOD . . . . . 08 STRAW/SHRUBS/GRASS . . . . . 09 AGRICULTURAL CROP . . . . . 10 ANIMAL DUNG . . . . . 11 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	
19	MAIN MATERIAL OF THE **FLOOR** OF THE HOUSEHOLD. RECORD OBSERVATION. IF DIFFERENT ROOMS HAVE DIFFERENT FLOOR MATERIAL, CIRCLE THE CODE FOR THE MOST COMMON, i.e., WHAT COVERS THE LARGEST AREA.	**NATURAL FLOOR** EARTH/SAND/MUD . . . . . 11 **RUDIMENTARY FLOOR** WOOD PLANKS . . . . . 21 **FINISHED FLOOR** PARQUET OR POLISHED WOOD . . . 31 FLOOR MAT, LINOLEUM, VINYL . . . . . 32 CERAMIC TILES . . . . . 33 CONCRETE, CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
20	MAIN MATERIAL OF THE **ROOF** OF THE HOUSEHOLD. RECORD OBSERVATION.	NATURAL ROOFING THATCH/PALM LEAF . . . . . 11 RUDIMENTARY ROOFING PALM/BAMBOO/MATS . . . . . 21 WOOD PLANKS . . . . . 22 TARPAULIN, PLASTIC . . . . . 23 FINISHED ROOFING ZINC, METAL . . . . . 31 WOOD . . . . . 32 CERAMIC TILES . . . . . 34 CONCRETE, CEMENT . . . . . 35 ASBESTOS SHEETS, SHINGLES . . . 36 OTHER _____ 96 (SPECIFY)	
21	MAIN MATERIAL OF THE OUTSIDE **WALLS** OF THE HOUSEHOLD. RECORD OBSERVATION.	NATURAL WALLS MUD AND STICKS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 STRAW, THATCH MATS . . . . . 13 RUDIMENTARY WALLS MUD BRICKS . . . . . 21 PLYWOOD, REUSED WOOD . . . . . 22 CARDBOARD, PLASTIC . . . . . 23 FINISHED WALLS CEMENT OR STONE BLOCKS . . . . . 31 BRICKS . . . . . 32 WOOD PLANKS/SHINGLES . . . . . 33 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
21A	How many rooms in total are in your household, including rooms for sleeping and all other rooms? INCLUDE ALL STRUCTURES BELONGING TO THE HOUSEHOLD DWELLING.	ROOMS (TOTAL)	
21B	How many rooms are used for sleeping in your household?	NUMBER OF ROOMS (SLEEPING)	
21C	How many sleeping facilities are currently in use in this household, including any beds, mattresses, mats, or rugs? ASK FOR BOTH INSIDE AND OUTSIDE OF DWELLING.	NUMBER OF SLEEPING FACILITIES	
22	Does any member of this household own:	**YES** **NO**	
	A canoe?	CANOE 1 2	
	A bicycle?	BICYCLE 1 2	
	A motorcycle or motor scooter?	MOTORCYCLE/SCOOTER . 1 2	
	An animal-drawn cart?	ANIMAL-DRAWN CART . . . 1 2	
	A car or truck?	CAR/TRUCK 1 2	
	A boat with a motor?	BOAT WITH MOTOR 1 2	
23	At any time in the past 12 months, has anyone come into your dwelling to spray the interior walls against mosquitoes?	YES 1 NO 2 DON'T KNOW 8	→ 25
24	Who sprayed the dwelling?	GOVERNMENT WORKER/PROGRAM 1 PRIVATE COMPANY 2 OTHER _____ (SPECIFY) 6 DON'T KNOW 8	
25	Does your household have any mosquito nets that can be used while sleeping?	YES . . . . . 1 NO 2	→ 27
26	Why doesn't your household have any mosquito nets? CIRCLE ALL MENTIONED.	NO MOSQUITOES . . . . . A NOT AVAILABLE . . . . . B DON'T LIKE TO USE NETS . . . . . C TOO EXPENSIVE . . . . . D OTHER _____ (SPECIFY) X	→ 40
27	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS	

		NET #1	NET #2	NET #3
28	ASK RESPONDENT TO SHOW YOU THE NETS. IF MORE THAN 3, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED, BUT HAS HOLES . . . 1 OBSERVED, DOES NOT HAVE HOLES . . . 2 NOT OBSERVED . . . 3	OBSERVED, BUT HAS HOLES . . . 1 OBSERVED, DOES NOT HAVE HOLES . . . 2 NOT OBSERVED . . . 3	OBSERVED, BUT HAS HOLES . . . 1 OBSERVED, DOES NOT HAVE HOLES . . . 2 NOT OBSERVED . . . 3
28A	OBSERVER OR ASK IF NET IS HANGING.	**OBSERVED** HANGING . . . 1 NOT HANGING . . . 2 **NOT OBSERVED** HANGING . . . 3 NOT HANGING . . . 4	**OBSERVED** HANGING . . . 1 NOT HANGING . . . 2 **NOT OBSERVED** HANGING . . . 3 NOT HANGING . . . 4	**OBSERVED** HANGING . . . 1 NOT HANGING . . . 2 **NOT OBSERVED** HANGING . . . 3 NOT HANGING . . . 4
29	How many months ago did your household obtain the mosquito net? IF LESS THAN ONE MONTH, WRITE '00'.	MONTHS AGO . . . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE . . . 98	MONTHS AGO . . . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE . . . 98	MONTHS AGO . . . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE . . . 98
29A	Where did you obtain this mosquito net?	NET DISTRIBUTION CAMPAIGN . . . 01 PRIMARY HEALTH CENTER/ HEALTH POST . . . 02 GOVERNMENT HOSPITAL . . . 03 PRIVATE HOSPITAL . . . 04 NGO/MISSION CLINIC . . . 05 MOSQUE/CHURCH . . . 06 PHARMACY . . . 07 PATENT MEDICINE STORE . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . 10 HAWKER . . . 11 DON'T KNOW . . . 96 OTHER ______ 98 (SPECIFY)	NET DISTRIBUTION CAMPAIGN . . . 01 PRIMARY HEALTH CENTER/ HEALTH POST . . . 02 GOVERNMENT HOSPITAL . . . 03 PRIVATE HOSPITAL . . . 04 NGO/MISSION CLINIC . . . 05 MOSQUE/CHURCH . . . 06 PHARMACY . . . 07 PATENT MEDICINE STORE . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . 10 HAWKER . . . 11 DON'T KNOW . . . 96 OTHER ______ 98 (SPECIFY)	NET DISTRIBUTION CAMPAIGN . . . 01 PRIMARY HEALTH CENTER/ HEALTH POST . . . 02 GOVERNMENT HOSPITAL . . . 03 PRIVATE HOSPITAL . . . 04 NGO/MISSION CLINIC . . . 05 MOSQUE/CHURCH . . . 06 PHARMACY . . . 07 PATENT MEDICINE STORE . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . 10 HAWKER . . . 11 DON'T KNOW . . . 96 OTHER ______ 98 (SPECIFY)
30	Did you buy the net or was it given to you free?	BOUGHT . . . 1 FREE . . . 2 (SKIP TO 32) DON'T KNOW . . . 8	BOUGHT . . . 1 FREE . . . 2 (SKIP TO 32) DON'T KNOW . . . 8	BOUGHT . . . 1 FREE . . . 2 (SKIP TO 32) DON'T KNOW . . . 8
31	How much did you pay for the net? IF DK, WRITE '99998'.	COST IN NAIRA [ ][ ][ ][ ][ ]	COST IN NAIRA [ ][ ][ ][ ][ ]	COST IN NAIRA [ ][ ][ ][ ][ ]
32	OBSERVE OR ASK THE TYPE AND 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 INSECTICIDE TREATED NET (LLIN)** PERMANET . . . 11 OLYSET . . . 12 ICONLIFE . . . 13 DURANET . . . 14 NETPROTECT . . . 15 BASF INTERCEPTOR . 16 OTHER/DK BRAND . 17 (SKIP TO 36) **RETREATABLE NET** . . . 21 (SKIP TO 34) **UNTREATED NET** . . . 31 (SKIP TO 34) **OTHER** ______ 96 (SPECIFY) **DON'T KNOW** . . . 98	**LONG-LASTING INSECTICIDE TREATED NET (LLIN)** PERMANET . . . 11 OLYSET . . . 12 ICONLIFE . . . 13 DURANET . . . 14 NETPROTECT . . . 15 BASF INTERCEPTOR . 16 OTHER/DK BRAND . 17 (SKIP TO 36) **RETREATABLE NET** . . . 21 (SKIP TO 34) **UNTREATED NET** . . . 31 (SKIP TO 34) **OTHER** ______ 96 (SPECIFY) **DON'T KNOW** . . . 98	**LONG-LASTING INSECTICIDE TREATED NET (LLIN)** PERMANET . . . 11 OLYSET . . . 12 ICONLIFE . . . 13 DURANET . . . 14 NETPROTECT . . . 15 BASF INTERCEPTOR . 16 OTHER/DK BRAND . 17 (SKIP TO 36) **RETREATABLE NET** . . . 21 (SKIP TO 34) **UNTREATED NET** . . . 31 (SKIP TO 34) **OTHER** ______ 96 (SPECIFY) **DON'T KNOW** . . . 98
33	When you got the net, was it already factory-treated with an insecticide to kill or repel mosquitos?	YES . . . 1 NO . . . 2 NOT SURE . . . 8	YES . . . 1 NO . . . 2 NOT SURE . . . 8	YES . . . 1 NO . . . 2 NOT SURE . . . 8
34	Since you got the mosquito net, was it ever soaked or dipped in a liquid to kill or repel mosquitos?	YES . . . 1 NO . . . 2 (SKIP TO 36) NOT SURE . . . 8	YES . . . 1 NO . . . 2 (SKIP TO 36) NOT SURE . . . 8	YES . . . 1 NO . . . 2 (SKIP TO 36) NOT SURE . . . 8
35	How many months ago was the net last soaked or dipped? IF LESS THAN ONE MONTH, 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 24 MONTHS AGO . . . 95 NOT SURE . . . 98	MONTHS AGO . . . . . . [ ][ ] MORE THAN 24 MONTHS AGO . . . 95 NOT SURE . . . 98	MONTHS AGO . . . . . . [ ][ ] MORE THAN 24 MONTHS AGO . . . 95 NOT SURE . . . 98

		NET #1	NET #2	NET #3
36	Did anyone sleep under this mosquito net last night?	YES .... 1 (SKIP TO 38) NO .... 2 NOT SURE .... 8 (SKIP TO 39)	YES .... 1 (SKIP TO 38) NO .... 2 NOT SURE .... 8 (SKIP TO 39)	YES .... 1 (SKIP TO 38) NO .... 2 NOT SURE .... 8 (SKIP TO 39)
37	Why didn't anyone sleep under this net?	NO MOSQUITOES .... 01 NO MALARIA .... 02 TOO HOT .... 03 DIFFICULT TO HANG .... 04 DON'T LIKE SMELL .... 05 FEEL 'CLOSED IN' OR CONSTRAINED .... 06 NET TOO OLD OR TORN .... 07 NET TOO DIRTY .... 08 NET NOT AVAILABLE LAST NIGHT (WASHING) .... 09 FEEL ITN CHEMICALS ARE UNSAFE .... 10 ITN PROVOKES COUGHING 11 USUAL USER(S) DID NOT SLEEP HERE LAST NIGHT 12 NET NOT NEEDED LAST NIGHT .... 13 OTHER ______ 96 (SPECIFY) DON'T KNOW .... 98 (SKIP TO 39)	NO MOSQUITOES .... 01 NO MALARIA .... 02 TOO HOT .... 03 DIFFICULT TO HANG .... 04 DON'T LIKE SMELL .... 05 FEEL 'CLOSED IN' OR CONSTRAINED .... 06 NET TOO OLD OR TORN .... 07 NET TOO DIRTY .... 08 NET NOT AVAILABLE LAST NIGHT (WASHING) .... 09 FEEL ITN CHEMICALS ARE UNSAFE .... 10 ITN PROVOKES COUGHING 11 USUAL USER(S) DID NOT SLEEP HERE LAST NIGHT 12 NET NOT NEEDED LAST NIGHT .... 13 OTHER ______ 96 (SPECIFY) DON'T KNOW .... 98 (SKIP TO 39)	NO MOSQUITOES .... 01 NO MALARIA .... 02 TOO HOT .... 03 DIFFICULT TO HANG .... 04 DON'T LIKE SMELL .... 05 FEEL 'CLOSED IN' OR CONSTRAINED .... 06 NET TOO OLD OR TORN .... 07 NET TOO DIRTY .... 08 NET NOT AVAILABLE LAST NIGHT (WASHING) .... 09 FEEL ITN CHEMICALS ARE UNSAFE .... 10 ITN PROVOKES COUGHING 11 USUAL USER(S) DID NOT SLEEP HERE LAST NIGHT 12 NET NOT NEEDED LAST NIGHT .... 13 OTHER ______ 96 (SPECIFY) DON'T KNOW .... 98 (SKIP TO 39)
38	Who slept under this mosquito net last night? RECORD THE PERSON'S LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ]	NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ]	NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ] NAME ______ LINE NUMBER [ ][ ]
39		GO BACK TO 28 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 40.	GO BACK TO 28 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 40.	GO BACK TO 28 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 40.

40	CHECK COLUMN 10. WRITE THE LINE NUMBER AND NAME FOR ALL CHILDREN 0-5 YEARS IN Q. 41 IN ORDER BY LINE NUMBER. IF MORE THAN 6 CHILDREN, USE ADDITIONAL QUESTIONNAIRES. **BE SURE TO FILL Qs. 50 AND 52.** IF NO CHILDREN AGE 0-5 YEARS IN HOUSEHOLD, END HOUSEHOLD QUESTIONNAIRE AND START WOMEN'S QUESTIONNAIRE.			
		CHILD 1	**CHILD 2**	**CHILD 3**
41	LINE NUMBER FROM COLUMN 10 NAME FROM COLUMN 2	LINE NUMBER . . . ☐☐ NAME _____	LINE NUMBER . . . ☐☐ NAME _____	LINE NUMBER . . . ☐☐ NAME _____
42	IF MOTHER INTERVIEWED, COPY CHILD'S MONTH AND YEAR FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐
43	CHECK 42: CHILD BORN IN JANUARY 2005 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)
44	CHECK 42: IS CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR FIVE PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2
45	LINE NUMBER OF PARENT OR ADULT RESPONSIBLE FOR CHILD. RECORD '00' IF NOT LISTED.	LINE NUMBER . . . ☐☐	LINE NUMBER . . . ☐☐	LINE NUMBER . . . ☐☐
	LAB SCIENTIST COMPLETE THIS SECTION			
46	READ **ANEMIA** CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR CHILD.	**CONSENT STATEMENT FOR ANEMIA TEST** As part of this survey, we are asking that children all over the country take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or disease. This survey will help the government to develop programs to prevent and treat anemia. We request that all children born in 2005 or later participate in the anemia testing part of this survey and give a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately and the result will be told to you right away. The result will be kept confidential. Do you have any questions about the anemia test? You can say yes to the test or you can say no. It is up to you to decide. Will you allow (NAME(S) OF CHILD(REN) to participate in the **anemia** test?		
47	**LAB SCIENTIST SIGNATURE** VERIFYING INTERVIEWER READ ANEMIA CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED TEST . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)
47A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT GRANTS TEST, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	_____ SIGNATURE/THUMB PRINT	_____ SIGNATURE/THUMB PRINT	_____ SIGNATURE/THUMB PRINT

		CHILD 1	CHILD 2	CHILD 3
48	READ **MALARIA** CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR CHILD.	**CONSENT STATEMENT FOR MALARIA TEST** As part of this survey, we are asking that children all over the country take a test to see if they have **malaria**. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will help the government to develop programs to prevent malaria. We request that all children born in 2005 or later participate in the malaria testing part of this survey and give a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test. (We will use blood from the same finger prick made for the anemia test). The blood will be tested for malaria immediately and the result will be told to you right away. The result will be kept confidential. We will also take (NAME'S) temperature to see if s/he has a fever. Do you have any questions about the malaria test? Will you allow me to take (NAME'S) temperature? You can say yes to the test or you can say no. It is up to you to decide. Will you allow (NAME(S) OF CHILD(REN) to participate in the **malaria** test?		
49	**LAB SCIENTIST SIGNATURE** VERIFYING INTERVIEWER READ MALARIA CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED TEST . . . . . 3 OTHER . . . . 6 (SKIP TO 50)	LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 50)	LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 50)
49A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT GRANTS TEST, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT
	CONDUCT TESTS FOR WHICH CONSENT IS GRANTED AND CONTINUE TO 50			
50	RECORD RESULT CODE OF **ANEMIA** TEST.	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 52)	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 52)	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 52)
51	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA PAMPHLET.	G/DL [ ][ ].[ ]	G/DL [ ][ ].[ ]	G/DL [ ][ ].[ ]
52	RECORD RESULT CODE OF **MALARIA** TEST	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 56)	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 56)	TESTED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 215)
53	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.

		CHILD 1	CHILD 2	CHILD 3
54	RESULT OF **MALARIA** TEST	POSITIVE .... 1 NEGATIVE .... 2 (SKIP TO 56) OTHER 6	POSITIVE .... 1 NEGATIVE .... 2 (SKIP TO 56) OTHER 6	POSITIVE .... 1 NEGATIVE .... 2 (SKIP TO 56) OTHER 6
54A	CIRCLE CODE IN FRONT OF BOXES TO RECORD WHETHER CHILD HAS A FEVER AND RECORD TEMPERATURE. IF TEMPERATURE IS 37.5°C OR HIGHER, RECORD TEMPERATURE UNDER CODE 2, HAS FEVER'.	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]
54B	RESULT OF TEMPERATURE MEASUREMENT	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6

NURSE COMPLETE THIS SECTION

54C	**IF MALARIA TEST IS POSITIVE:** READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD. ASK ABOUT ANY TREATMENT THE CHILD HAS ALREADY RECEIVED.	**CONSENT STATEMENT FOR MALARIA TREATMENT** The malaria test shows that (NAME) has malaria. We can give you free medicine. The medicine is called ACT. ACT is very effective and in a few days it should get rid of the malaria and other symptoms. You do not have to give (NAME) the medicine. This is up to you. Please tell me whether you accept the medicine or not. BEFORE PROVIDING ACT, FIRST ASK: Is (NAME) already taking any other drugs or medicine to treat malaria? IF YES, ASK TO SEE THE MEDICINE. IF CHILD IS ALREADY TAKING ACT, CHECK ON THE DOSE ALREADY AVAILABLE. BE CAREFUL NOT TO OVERTREAT THE CHILD.

		CHILD 1	CHILD 2	CHILD 3
55	**NURSE SIGNATURE** VERIFYING INTERVIEWER READ TREATMENT CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED .... 3 ALREADY HAS ACT . 4 NOT ELIGIBLE .... 5 OTHER .... 6 (SKIP TO 56)	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED .... 3 ALREADY HAS ACT . 4 NOT ELIGIBLE .... 5 OTHER .... 6 (SKIP TO 56)	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED .... 3 ALREADY HAS ACT . 4 NOT ELIGIBLE .... 5 OTHER .... 6 (SKIP TO 56)
55A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT ACCEPTS MEDICINE, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT
55B	RECORD CHILD'S WEIGHT IN KILOGRAMS	KG. ... [ ][ ].[ ]	KG. ... [ ][ ].[ ]	KG. ... [ ][ ].[ ]
55C	RESULT OF WEIGHT MEASUREMENT	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6	MEASURED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER 6
56		GO BACK TO 42 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE ADDITIONAL QUESTIONNAIRE(S); IF NO MORE CHILDREN, END INTERVIEW.		

TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS

TREATMENT WITH ACT

Weight (in kg)	**Age**	**Artemether-Lumefantrine**
Less than 5 kgs	Nothing	Nothing
5-14 kgs	6 months - 3 years	1 tablet twice a day for 3 days
15-25 kgs	4 - 8 years	2 tablets twice a day for 3 days

IF CHILD WEIGHS LESS THAN 5 KGS, DO NOT LEAVE DRUGS. TELL PARENT TO TAKE CHILD TO HEALTH FACILITY.

		CHILD 4	CHILD 5	CHILD 6
41	LINE NUMBER FROM COLUMN 10 NAME FROM COLUMN 2	LINE NUMBER . . . ☐☐ NAME _____	LINE NUMBER . . . ☐☐ NAME _____	LINE NUMBER . . . ☐☐ NAME _____
42	IF MOTHER INTERVIEWED, COPY CHILD'S MONTH AND YEAR FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐
43	CHECK 42: CHILD BORN IN JANUARY 2005 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)	YES . . . . . 1 NO . . . . . 2 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56)
44	CHECK 42: IS CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR FIVE PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 42 FOR NEXT CHILD OR, IF NO MORE, GO TO 56) OLDER 2
45	LINE NUMBER OF PARENT OR ADULT RESPONSIBLE FOR CHILD. RECORD '00' IF NOT LISTED.	LINE NUMBER . . . ☐☐	LINE NUMBER . . . ☐☐	LINE NUMBER . . . ☐☐
	LAB SCIENTIST COMPLETE THIS SECTION			
46	READ **ANEMIA** CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR CHILD.	**CONSENT STATEMENT FOR ANEMIA TEST** As part of this survey, we are asking that children all over the country take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or disease. This survey will help the government to develop programs to prevent and treat anemia. We request that all children born in 2005 or later participate in the anemia testing part of this survey and give a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately and the result will be told to you right away. The result will be kept confidential. Do you have any questions about the anemia test? You can say yes to the test or you can say no. It is up to you to decide. Will you allow (NAME(S) OF CHILD(REN) to participate in the **anemia** test?		
47	**LAB SCIENTIST SIGNATURE** VERIFYING INTERVIEWER READ ANEMIA CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED TEST . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)	_____ LAB SCIENTIST SIGNATURE GRANTED TEST . . . . . 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 48)
47A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT GRANTS TEST, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	_____ SIGNATURE/THUMB PRINT	_____ SIGNATURE/THUMB PRINT	_____ SIGNATURE/THUMB PRINT

		CHILD 4	CHILD 5	CHILD 6
48	READ **MALARIA** CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR CHILD.	**CONSENT STATEMENT FOR MALARIA TEST** As part of this survey, we are asking that children all over the country take a test to see if they have **malaria**. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will help the government to develop programs to prevent malaria. We request that all children born in 2005 or later participate in the malaria testing part of this survey and give a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test. We will use blood from the same finger prick made for the anemia test. The blood will be tested for malaria immediately and the result will be told to you right away. The result will be kept confidential. We will also take (NAME'S) temperature to see if s/he has a fever. Do you have any questions about the malaria test? Will you allow me to take (NAME'S) temperature? You can say yes to the test or you can say no. It is up to you to decide. Will you allow (NAME(S) OF CHILD(REN) to participate in the **malaria** test?		
49	**LAB SCIENTIST SIGNATURE** VERIFYING INTERVIEWER READ MALARIA CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	__________ LAB SCIENTIST SIGNATURE GRANTED TEST ..... 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED TEST ..... 3 OTHER .... 6 (SKIP TO 50)	__________ LAB SCIENTIST SIGNATURE GRANTED TEST ..... 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 50)	__________ LAB SCIENTIST SIGNATURE GRANTED TEST ..... 1 GRANTED TEST, REFUSED SIGNATURE THUMB PRINT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 50)
49A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT GRANTS TEST, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	__________ SIGNATURE/THUMB PRINT	__________ SIGNATURE/THUMB PRINT	__________ SIGNATURE/THUMB PRINT
	CONDUCT TESTS FOR WHICH CONSENT IS GRANTED AND CONTINUE TO 50			
50	RECORD RESULT CODE OF **ANEMIA** TEST.	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 52)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 52)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 52)
51	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA PAMPHLET.	G/DL [ ][ ].[ ]	G/DL [ ][ ].[ ]	G/DL [ ][ ].[ ]
52	RECORD RESULT CODE OF **MALARIA** TEST	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 56)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 56)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 215)
53	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. BARCODE PUT THE 2ND BAR CODE LABEL ON THE THICK BLOOD SMEAR SLIDE, THE 3RD ON THE THIN BLOOD SMEAR SLIDE, THE 4TH ON THE PARACHECK, AND THE 5TH ON THE TRANSMITTAL FORM.

		CHILD 4	CHILD 5	CHILD 6
54	RESULT OF **MALARIA** TEST	POSITIVE . . . . 1 NEGATIVE . . . . 2 (SKIP TO 56) OTHER 6	POSITIVE . . . . 1 NEGATIVE . . . . 2 (SKIP TO 56) OTHER 6	POSITIVE . . . . 1 NEGATIVE . . . . 2 (SKIP TO 56) OTHER 6
54A	CIRCLE CODE IN FRONT OF BOXES TO RECORD WHETHER CHILD HAS A FEVER AND RECORD TEMPERATURE. IF TEMPERATURE IS 37.5°C OR HIGHER, RECORD TEMPERATURE UNDER CODE 2, HAS FEVER'.	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]	NO FEVER (°C) 1 [ ][ ].[ ] HAS FEVER (°C) 2 [ ][ ].[ ]
54B	RESULT OF TEMPERATURE MEASUREMENT	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6
		NURSE COMPLETE THIS SECTION		
54C	**IF MALARIA TEST IS POSITIVE:** READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD. ASK ABOUT ANY TREATMENT THE CHILD HAS ALREADY RECEIVED.	**CONSENT STATEMENT FOR MALARIA TREATMENT** The malaria test shows that (NAME) has malaria. We can give you free medicine. The medicine is called ACT. ACT is very effective and in a few days it should get rid of the malaria and other symptoms. You do not have to give (NAME) the medicine. This is up to you. Please tell me whether you accept the medicine or not. BEFORE PROVIDING ACT, FIRST ASK: Is (NAME) already taking any other drugs or medicine to treat malaria? IF YES, ASK TO SEE THE MEDICINE. IF CHILD IS ALREADY TAKING ACT, CHECK ON THE DOSE ALREADY AVAILABLE. BE CAREFUL NOT TO OVERTREAT THE CHILD.		
55	**NURSE SIGNATURE** VERIFYING INTERVIEWER READ TREATMENT CONSENT TO THE RESPONDENT. CIRCLE THE APPROPRIATE CODE.	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . 3 ALREADY HAS ACT . 4 NOT ELIGIBLE . . . . 5 OTHER . . . . 6 (SKIP TO 56)	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . 3 ALREADY HAS ACT . 4 NOT ELIGIBLE . . . . 5 OTHER . . . . 6 (SKIP TO 56)	NURSE SIGNATURE ACCEPTED MEDICINE . 1 ACCEPTED MEDICINE REFUSED SIGNATURE THUMB PRINT . . . . . 2 REFUSED . . . . 3 ALREADY HAS ACT . 4 NOT ELIGIBLE . . . . 5 OTHER . . . . 6 (SKIP TO 56)
55A	**RESPONDENT SIGNATURE/ THUMB PRINT** IF RESPONDENT ACCEPTS MEDICINE, HAVE RESPONDENT SIGN OR PLACE THUMB PRINT ON THE LINE.	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT	SIGNATURE/THUMB PRINT
55B	RECORD CHILD'S WEIGHT IN KILOGRAMS	KG. . . . [ ][ ].[ ]	KG. . . . [ ][ ].[ ]	KG. . . . [ ][ ].[ ]
55C	RESULT OF WEIGHT MEASUREMENT	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6	MEASURED . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . 3 OTHER 6
56		GO BACK TO 42 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE ADDITIONAL QUESTIONNAIRE(S); IF NO MORE CHILDREN, END INTERVIEW.		

TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS

TREATMENT WITH ACT		
Weight (in kg)	**Age**	**Artemether-Lumefantrine**
Less than 5 kgs	Nothing	Nothing
5-14 kgs	6 months - 3 years	1 tablet twice a day for 3 days
15-25 kgs	4 - 8 years	2 tablets twice a day for 3 days
IF CHILD WEIGHS LESS THAN 5 KGS, DO NOT LEAVE DRUGS. TELL PARENT TO TAKE CHILD TO HEALTH FACILITY.		

29 September 2010

C O N F I D E N T I A L

NIGERIA MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

NATIONAL POPULATION COMMISSION
NATIONAL MALARIA CONTROL PROGRAM

National Health Research Ethics Committee
Assigned Number NHREC/01/01/2007 - 10/09/2010b

IDENTIFICATION

STATE	
LOCAL GOVT. AREA	
LOCALITY	
ENUMERATION AREA	
URBAN/RURAL (URBAN=1, RURAL=2)	
CLUSTER NUMBER	
BUILDING NUMBER	
HOUSEHOLD HEAD NAME/NUMBER	
NAME AND LINE NUMBER OF WOMAN	

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2010)
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

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

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** — 4
LANGUAGE OF INTERVIEW**
NATIVE LANGUAGE OF RESPONDENT**
TRANSLATOR USED (1=NOT AT ALL; 2=SOMETIME; 3=ALL THE TIME)

**LANGUAGE CODES: 1 HAUSA; 2 YORUBA; 3 IGBO; 4 ENGLISH; 6 OTHER (SPECIFY)

SUPERVISOR/EDITOR	OFFICE EDITOR	KEYED BY
NAME		
DATE		

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Greetings. My name is _____ and I am working with National Population Commission. We are conducting a national survey about malaria all over Nigeria. This study has been reviewed and granted approval by the National Health Research Ethics Committee, assigned number NHREC/01/01/2007, for the study period of September 2010 to September 2011. Your household was selected for the survey. We would very much appreciate your participitation in this survey. This information you provide will help the government to plan health services. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. Should you have any questions, feel free to call any of the following contact person(s):

2010 NMIS Contact Person, NPC: Project Director; **Email:** saligar58@yahoo.com; **Phone**: 08033708114

NMCP Contact Person: National Coordinator; **Email:** jide_coker1@yahoo.com; **Phone:** 08037860784

NHREC Contact Person(s): Secretary, NHREC; **Email:** secretary@nhrec.net; **Phone:** 08033143791
Desk Officer, NHREC; **Email:** deskofficer@nhrec.net; **Phone:** 08065479926

Participation in this survey is voluntary, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. 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?

Signature of interviewer: _____ Date: _____

Signature/thumb print of respondent: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEW . . . . . 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIE . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	
102	In what month and year were you born?	MONTH . . . . . [ ][ ] DON'T KNOW MONTH . . . . . 98 YEAR . . . . . [ ][ ][ ][ ] DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS [ ][ ]	
104	Have you ever attended school?	YES . . . . . 1 NO 2	→ 108
105	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY . . . . . 1 SECONDARY . . . . . 2 HIGHER 3	
106	What is the highest (class/form/year) you completed at that level? IF COMPLETED LESSD THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	CLASS/FORM/YEAR . . . . . [ ][ ]	
107	CHECK 105: PRIMARY ☐ ↓ SECONDARY OR HIGHER ☐ →		109

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW SENTENCES ON CARD TO RESPONDENT. IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL . . . . . 1 ABLE TO READ ONLY PARTS OF SENTENCE . . . . . 2 ABLE TO READ WHOLE SENTENCE. . 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	What is your religion?	CHRISTIANITY . . . . . 1 ISLAM . . . . . 2 TRADITIONAL RELIGION . . . . . 3 NO RELIGION . . . . . 4 OTHER _____ 6 (SPECIFY)	
110	What is your ethnic group?	_____ ☐☐☐	

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever born a child?	YES . . . . . 1 NO 2	→ 206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES . . . . . 1 NO 2	→ 204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME . . . . . [ ][ ] DAUGHTERS AT HOME . . . . . [ ][ ]	
204	Do you have any children you born who are alive but do not live with you?	YES . . . . . 1 NO 2	→ 206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE . . . . . [ ][ ] DAUGHTERS ELSEWHERE . [ ][ ]	
206	Have you ever born a child who was born alive and later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES . . . . . 1 NO 2	→ 208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD . . . . . [ ][ ] GIRLS DEAD . . . . . [ ][ ]	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL . . . . . [ ][ ]	
209	CHECK 208: Just to make sure that I have this right: you have had in **total** ____ children in your life. Is that correct? YES ☐ NO ☐ → PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE OR MORE BIRTHS ☐ NO BIRTHS Q.208 IS '00' ☐ → 224		

211 Now I would like to record the names of all your births, whether still alive or not, starting with the first one you had.

RECORD NAMES OF ALL THE BIRTHS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.
(IF THERE ARE MORE THAN 12 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE, STARTING WITH THE SECOND ROW).

212 What name was given to your (first/next) baby? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still living?	217 IF LIVING: How old is (NAME)? RECORD AGE IN COMPLETED YEARS.	218 IF LIVING: Is (NAME) living with you?	219 IF LIVING: RECORD HOUSEHOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD).	220 IF DEAD: How old was (NAME) when he/she died? IF '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)? including any children who died after birth?
01	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (NEXT BIRTH)	DAYS . . . 1 MONTHS 2 YEARS . . 3	
02	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
03	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
04	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
05	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
06	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
07	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH

212 What name was given to your next baby? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still alive?	217 IF LIVING: How old was (NAME) at his/her last birthday? RECORD AGE IN COM-PLETED YEARS.	218 IF LIVING: Is (NAME) living with you?	219 IF LIVING: RECORD HOUSE-HOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 IF DEAD: How old was (NAME) when he/she died? IF '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
08	SING 1 MULT 2	BOY 1 GIRL 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . 1 NO . . . 2 → 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	LINE NUMBER ☐☐ (GO TO 221)	DAYS . . . 1 ☐☐ MONTHS 2 ☐☐ YEARS . . 3 ☐☐	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
09	SING 1 MULT 2	BOY 1 GIRL 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . 1 NO . . . 2 → 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	LINE NUMBER ☐☐ (GO TO 221)	DAYS . . . 1 ☐☐ MONTHS 2 ☐☐ YEARS . . 3 ☐☐	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
10	SING 1 MULT 2	BOY 1 GIRL 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . 1 NO . . . 2 → 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	LINE NUMBER ☐☐ (GO TO 221)	DAYS . . . 1 ☐☐ MONTHS 2 ☐☐ YEARS . . 3 ☐☐	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
11	SING 1 MULT 2	BOY 1 GIRL 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . 1 NO . . . 2 → 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	LINE NUMBER ☐☐ (GO TO 221)	DAYS . . . 1 ☐☐ MONTHS 2 ☐☐ YEARS . . 3 ☐☐	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
12	SING 1 MULT 2	BOY 1 GIRL 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . 1 NO . . . 2 → 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	LINE NUMBER ☐☐ (GO TO 221)	DAYS . . . 1 ☐☐ MONTHS 2 ☐☐ YEARS . . 3 ☐☐	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH

222	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTHS(S) IN BIRTH TABLE.	YES . . . . . 1 NO 2
223	COMPARE 208 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK: NUMBERS ARE SAME ☐↓ NUMBERS ARE DIFFERENT ☐→ (PROBE AND RECONCILE)	
224	CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2005 OR LATER. IF NONE, RECORD '0' AND CONTINUE TO Q. 225.	☐

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
225	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 227
226	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS	
226A	Have you seen anyone for antenatal care?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 226C) ←	
226B	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	**HEALTH PERSONNEL** DOCTOR . . . . . A NURSE/MIDWIFE B AUXILIARY MIDWIFE . . . . . C COMMUNITY HEALTH EXTENSION WORKER (CHEW) . D **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT . . . . . E COMMUNITY ORIENTED RESOURCE PERSON . . . . . F OTHER _____ . . . . . X (SPECIFY) **NO ONE** . . . . . Y	
226C	During this current pregnancy, did you take any drugs in order to prevent you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 227
226D	What drugs did you take to prevent malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
226E	CHECK 226D: SP/FANSIDAR TAKEN FOR MALARIA PREVENTION CODE 'A' CIRCLED ↓ ☐ CODE 'A' NOT CIRCLED ☐ →		227
226F	How many months pregnant were you when you took your **first** dose of SP/Fansidar?	MONTHS PREGNANT . . . . . DON'T KNOW 98	
226G	How many times did you take SP/Fansidar) during this pregnancy?	TIMES	
227	CHECK 224: ONE OR MORE BIRTHS IN 2005 OR LATER ↓ ☐ NO BIRTHS IN 2005 OR LATER ☐ →		401

SECTION 3A. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

301	CHECK 212 AND 215: ENTER IN 302 THE NAME AND LINE NUMBER OF THE MOST RECENT BIRTH SINCE 2005 EVEN IF THE CHILD IS NO LONGER ALIVE. 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	NAME AND LINE NUMBER FROM 212.	NAME OF LAST BIRTH _____ LINE NUMBER . . . . . ☐☐ LIVING ☐ DEAD ☐	
303	When you were pregnant with (NAME) did you see anyone for antenatal care?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 305)	
304	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	**HEALTH PERSONNEL** DOCTOR . . . . . A NURSE/MIDWIFE B AUXILIARY MIDWIFE . . . . . C COMMUNITY HEALTH EXTENSION WORKER (CHEW) . D **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT . . . . . E COMMUNITY ORIENTED RESOURCE PERSON . . . . . F OTHER _____ . . . . . X (SPECIFY) **NO ONE** . . . . . Y	
305	During this pregnancy, did you take any drugs in order to prevent you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 312
306	What drugs did you take to prevent malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
307	CHECK 306: SP/FANSIDAR TAKEN FOR MALARIA PREVENTION CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ → 312		
308	How many times did you take SP/Fansidar) during this pregnancy?	TIMES . . . . . ☐☐	

309	CHECK 304: ANTENATAL CARE FROM HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY? CODE 'A', 'B', 'C', OR 'D' CIRCLED OTHER → 312		
310	Did you get the (SP/Fansidar) during an antenatal care visit?	YES . . . . . 1 NO 2	
311	Did you receive a mosquito net during an antenatal care visit?	YES . . . . . 1 NO 2	
312	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

313	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN IN 2005 OR LATER. IF THERE ARE MORE THAN 3 LIVING CHILDREN BORN IN 2005 OR LATER, USE ADDITIONAL QUESTIONNAIRES. Now I would like to ask you some questions about the health of your children less than 5 years old. We will talk about each one separately.			
314	NAME AND LINE NUMBER FROM 212	LAST BIRTH LINE NUMBER . . . ☐☐ NAME ______________	NEXT-TO-LAST BIRTH LINE NUMBER . . . ☐☐ NAME ______________	SECOND-FROM-LAST BIRTH LINE NUMBER . . . ☐☐ NAME ______________
315	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . 1 NO . . . . 2 (GO BACK TO 314 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (GO BACK TO 314 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (GO BACK TO 314 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401) DON'T KNOW 8
316	How many days ago did the fever start? IF LESS THAN ONE DAY, WRITE '00'.	DAYS AGO . ☐☐ DON'T KNOW 98	DAYS AGO . ☐☐ DON'T KNOW 98	DAYS AGO . ☐☐ DON'T KNOW 98
317	Did you seek advice or treatment for the fever from any source?	YES . . . . 1 NO . . . . 2 (SKIP TO 320)	YES . . . . 1 NO . . . . 2 (SKIP TO 320)	YES . . . . 1 NO . . . . 2 (SKIP TO 320)
318	Where did you get treatment from? Anywhere else? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. ______________ (NAME OF PLACE(S)) ______________ (NAME OF PLACE(S)) ______________ (NAME OF PLACE(S))	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . . B GOVT HEALTH POST . . . . C MOBILE CLINIC . D ROLE MODEL CAREGIVER/ COMMUNITY WORKER . . . E OTHER PUBLIC ______________ F (SPECIFY) **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . G PHARMACY . . . H CHEMIST/PMV . . . I PVT DOCTOR . . . J MOBILE CLINIC . K OTHER PRIVATE ______________ L (SPECIFY) **OTHER SOURCE** SHOP . . . . M TRADITIONAL PRACTITIONER N DRUG HAWKER . O OTHER ______________ X (SPECIFY)	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . . B GOVT HEALTH POST . . . . C MOBILE CLINIC . D ROLE MODEL CAREGIVER/ COMMUNITY WORKER . . . E OTHER PUBLIC ______________ F (SPECIFY) **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . G PHARMACY . . . H CHEMIST/PMV . . . I PVT DOCTOR . . . J MOBILE CLINIC . K OTHER PRIVATE ______________ L (SPECIFY) **OTHER SOURCE** SHOP . . . . M TRADITIONAL PRACTITIONER N DRUG HAWKER . O OTHER ______________ X (SPECIFY)	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . . B GOVT HEALTH POST . . . . C MOBILE CLINIC . D ROLE MODEL CAREGIVER/ COMMUNITY WORKER . . . E OTHER PUBLIC ______________ F (SPECIFY) **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . G PHARMACY . . . H CHEMIST/PMV . . . I PVT DOCTOR . . . J MOBILE CLINIC . K OTHER PRIVATE ______________ L (SPECIFY) **OTHER SOURCE** SHOP . . . . M TRADITIONAL PRACTITIONER N DRUG HAWKER . O OTHER ______________ X (SPECIFY)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
319	How many days after the fever began did you first seek treatment for (NAME)? IF SAME DAY, RECORD '00'.	DAYS . . . . . . [ ][ ]	DAYS . . . . . . [ ][ ]	DAYS . . . . . . [ ][ ]
320	At any time during the illness, did (NAME) have a drop of blood taken from his/her finger or heel for testing?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
321	At any time during the illness, did (NAME) take any drugs for the illness?	YES . . . . 1 NO . . . . 2 (SKIP TO 323)	YES . . . . 1 NO . . . . 2 (SKIP TO 323)	YES . . . . 1 NO . . . . 2 (SKIP TO 323)
322	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED. ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STIL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D ARTEMISININ COMBINATION THERAPY (ACT) . E OTHER ANTI-MALARIAL ________ . . . F (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . G INJECTION . . . H **OTHER DRUGS** PARACETAMOL . I ASPIRIN . . . . J ACETA-MINOPHEN . . . K IBUPROFEN . . . L **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . . Z	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D ARTEMISININ COMBINATION THERAPY (ACT) . E OTHER ANTI-MALARIAL ________ . . . F (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . G INJECTION . . . H **OTHER DRUGS** PARACETAMOL . I ASPIRIN . . . . J ACETA-MINOPHEN . . . K IBUPROFEN . . . L **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . . Z	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D ARTEMISININ COMBINATION THERAPY (ACT) . E OTHER ANTI-MALARIAL ________ . . . F (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . G INJECTION . . . H **OTHER DRUGS** PARACETAMOL . I ASPIRIN . . . . J ACETA-MINOPHEN . . . K IBUPROFEN . . . L **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . . Z
323	CHECK 322: ANY CODE A-F CIRCLED?	YES [ ] NO [ ] (GO BACK TO 315 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401)	YES [ ] NO [ ] (GO BACK TO 315 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401)	YES [ ] NO [ ] (GO TO 315 IN FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 401)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
324	CHECK 322: SP/FANSIDAR ('A') GIVEN	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 327)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 327)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 327)
325	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
326	For how many days did (NAME) take the SP/Fansidar? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
327	CHECK 322: CHLOROQUINE ('B') GIVEN	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 330)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 330)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 330)
328	How long after the fever started did (NAME) first take chloroquine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
329	For how many days did (NAME) take the chloroquine? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
330	CHECK 322: AMODIAQUINE ('C') GIVEN	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 333)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 333)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 333)
331	How long after the fever started did (NAME) first take amodiaquine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
332	For how many days did (NAME) take the amodiaquine? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________________	NEXT-TO-LAST BIRTH NAME ________________	SECOND-FROM-LAST BIRTH NAME ________________
333	CHECK 322: QUININE ('D') GIVEN	CODE 'D' CIRCLED ☐ ↓ CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)	CODE 'D' CIRCLED ☐ ↓ CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)	CODE 'D' CIRCLED ☐ ↓ CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)
334	How long after the fever started did (NAME) first take quinine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
335	For how many days did (NAME) take the quinine? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
336	CHECK 322: ACT ('E') GIVEN	CODE 'E' CIRCLED ☐ ↓ CODE 'E' NOT CIRCLED ☐ (SKIP TO 339)	CODE 'E' CIRCLED ☐ ↓ CODE 'E' NOT CIRCLED ☐ (SKIP TO 339)	CODE 'E' CIRCLED ☐ ↓ CODE 'E' NOT CIRCLED ☐ (SKIP TO 339)
337	How long after the fever started did (NAME) first take ACT?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
338	For how many days did (NAME) take the ACT? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
339	CHECK 322: OTHER ANTIMALARIAL ('F') GIVEN	CODE 'F' CIRCLED ☐ ↓ CODE 'F' NOT CIRCLED ☐ (SKIP TO 342)	CODE 'F' CIRCLED ☐ ↓ CODE 'F' NOT CIRCLED ☐ (SKIP TO 342)	CODE 'F' CIRCLED ☐ ↓ CODE 'F' NOT CIRCLED ☐ (SKIP TO 342)
340	How long after the fever started did (NAME) first take the (OTHER ANTIMALARIAL)?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
341	For how many days did (NAME) take the (OTHER ANTIMALARIAL)? IF 7 DAYS OR MORE, WRITE '7'.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
342		GO BACK TO 315 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401.	GO BACK TO 315 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 401.	GO TO 315 IN 1st COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, TO 401.

SECTION 4. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
401	Have you ever heard of an illness called malaria?	YES . . . . . 1 NO 2	→ 414
402	What are some things that can happen to you when you have malaria? CIRCLE ALL MENTIONED.	FEVER . . . . . A CHILLS/SHIVERING . . . . . B HEADACHE . . . . . C JOINT PAIN . . . . . D POOR APPETITE . . . . . E VOMITTING . . . . . F CONVULSION . . . . . G OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
403	Who is most likely to get a serious case of malaria? CIRCLE ALL MENTIONED.	CHILDREN . . . . . A PREGNANT WOMEN . . . . . B ADULTS . . . . . C ELDERLY . . . . . D EVERYONE . . . . . E DON'T KNOW . . . . . Z	
404	What causes malaria? CIRCLE ALL MENTIONED.	MOSQUITOES . . . . . A STAGNANT WATER . . . . . B DIRTY SURROUNDINGS . . . . . C BEER . . . . . D CERTAIN FOODS . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
405	Are there ways to avoid getting malaria?	YES . . . . . 1 NO 2	→ 408
406	What are the ways to avoid getting malaria? CIRCLE ALL MENTIONED.	SLEEP UNDER MOSQUITO NET . . . . . A SLEEP UNDER AN ITN/LLIN . . . . . B USE INSECTICIDE SPRAY . . . . . C USE MOSQUITO COILS . . . . . D KEEP DOORS AND WINDOWS CLOSED . . . . . E USE INSECT REPELLANT . . . . . F KEEP SURROUNDINGS CLEAN . . . . . G CUT THE GRASS . . . . . H ELILMINATE STAGNANT WATER AROUND LIVING AREA . . . . . I OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
407	What can a pregnant woman do to prevent malaria? CIRCLE ALL MENTIONED.	SLEEP UNDER MOSQUITO NET . . . . . A SLEEP UNDER AN ITN/LLIN . . . . . B KEEP ENVIRONMENT CLEAN . . . . . C TAKE SP/FANSIDAR GIVEN DURING ANTENATAL CARE . . . . . D TAKE DARAPRIM TABLETS (SUNDAY-SUNDAY MEDICINE) . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
408	Can malaria be treated?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 411
409	What drugs are used to treat adults with malaria ? CIRCLE ALL MENTIONED.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B QUININE . . . . . C ACT . . . . . D ASPIRIN, PANADOL, PARACETAMOL E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	

410	What drugs are used to treat children with malaria? CIRCLE ALL MENTIONED.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B QUININE . . . . . C ACT . . . . . D ASPIRIN/PANADOL/PARACETAMOL . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
411	In the past 4 weeks, have you seen or heard any messages about malaria?	YES . . . . . 1 NO 2	→ 414
412	What messages about malaria have you seen or heard? CIRCLE ALL MENTIONED.	**BILLBOARDS** MOSQUITO BACKING BABY . . . . . A MAN PLAYING DRAFTS WITH MOSQUITO . . . . . B MOSQUITO APPEARS IN FAMILY PICTURE . . . . . C WOMAN WEARING MOQUITO NET AS CLOTHES GOING TO MARKET . . . D **TELEVISION** FRIENDS PLAYING DRAFTS, WHERE SMALL FRIEND SLAPS THE BIG FRIEND (MR. CALYPSO) . . . . . E MOSQUITO TAKES CHILD AWAY WHILE FAMILY IS SLEEPING . . . . . F WOMAN WEARING MOQUITO NET AS CLOTHES GOING TO MARKET . . . G WOMAN TELLS HER HUSBAND "YOU DON BECOME DOCTOR AND YOU SABI BELLE PASS ME...I PITY MALARIA" . . . . . H THE KING GETS SLAPPED . . . . . I LONART VERSUS MALARIA . . . . . J **RADIO** . . . . . K OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
413	Where did you hear or see these messages? CIRCLE ALL MENTIONED.	RADIO . . . . . A TELEVISION . . . . . B COMMUNITY HEALTH EXTENSION WORKER (CHEW) . . . . . C COMMUNITY ORIENTED RESOURCE PERSON (CORP) . . . . . D ROLE MODEL CAREGIVER/ COMMUNITY WORKER . . . . . E MOSQUE/CHURCH . . . . . F TOWN ANNOUNCER . . . . . G COMMUNITY EVENT . . . . . H BILLBOARD . . . . . I POSTER . . . . . J T-SHIRT . . . . . K LEAFLET/FACT SHEET/ BROCHURE . L RELATIVE/FRIEND/NEIGHBOUR SCHOOL . . . . . M OTHER _____ X (SPECIFY)	
414	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	