NIGERIA

Malaria Indicator Survey (MIS)

2015

The Federal Republic of Nigeria

Nigeria
Malaria Indicator Survey 2015

Final Report

National Malaria Elimination Programme
Federal Ministry of Health
Federal Republic of Nigeria
Abuja, Nigeria

National Population Commission
Federal Republic of Nigeria
Abuja, Nigeria

National Bureau of Statistics
Federal Republic of Nigeria
Abuja, Nigeria

ICF International
Rockville, Maryland, USA

August 2016

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The 2015 Nigeria Malaria Indicator Survey (2015 NMIS) was implemented by the National Malaria Elimination Programme (NMEP), the National Population Commission (NPopC), and the National Bureau of Statistics (NBS) from October 2015 through November 2015. Funding for the 2015 NMIS was provided by the United States President's Malaria Initiative (PMI); the Global Fund to Fight AIDS, Tuberculosis, and Malaria; and the United Kingdom Department for International Development (DFID) through the Support to National Malaria Program (SuNMaP). Other partners who provided technical support include the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and Society for Family Health (SFH). ICF International provided technical assistance as well as funding to the project through The DHS Program, a project funded by the United States Agency for International Development (USAID), provides support and technical assistance in the implementation of population and health surveys in countries worldwide.

Additional information about the 2015 NMIS may be obtained from the National Malaria Elimination Programme, 1st Floor, Abia House, Central Business District, Abuja; Telephone: +234 803000296 or the headquarters of the National Population Commission, Plot 2031, Olusegun Obasanjo Way, Zone 7 Wuse District, PMB 0281, Abuja, Nigeria; Telephone: +234 9 523 9173; Fax: +234 9 5231024.

Information about The DHS Program may be obtained from ICF International, 530 Gaither Road, Suite 500, Rockville, MD 20850 USA; Telephone: +1-301-407-6500; Fax: +1-301-407-6501; E-mail: info@DHSprogram.com; Internet: www.DHSprogram.com.

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FOREWORD

Malaria remains a major public health challenge in Nigeria. Considerable effort has been made to reduce the prevalence and impact of the disease, however. The last decade of malaria control has witnessed increased support by government and its partners in the areas of mass, long-lasting insecticidal net (LLIN) campaigns, replacement campaigns, intermittent preventive treatment (IPT), and a massive scale up in malaria case management. Consequently, it has become necessary to provide evidence-based data for information on the status of programme implementation and progress towards malaria control in the country.

As you are aware, Nigeria has implemented three National Malaria Strategic Plans to date, and is presently implementing a fourth plan, which covers the period 2014-2020. The NMSP 2014-2020 aims to achieve pre-elimination status and reduce malaria-related deaths to zero by 2020. The need to measure the impact of these plans calls for the availability of data from routine sources, principally the District Health Information System (DHIS), operations research, and surveys, particularly the Nigeria Malaria Indicator Survey (NMIS).

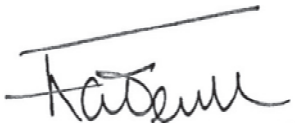
The first NMIS was implemented in 2010. The prevalence of malaria was 52 percent using the malaria rapid diagnostic test (RDT) and 42 percent using microscopy. Though long-lasting insecticidal net (LLIN) coverage for households having at least one LLIN was 42 percent, LLIN utilization was 29 percent for children under age 5 and 28 percent for pregnant women. While antenatal care (ANC) coverage from a skilled provider was 58 percent, only 13 percent of women received at least two doses of sulfadoxine-pyrimethamine (SP) during an ANC visit for their last pregnancy.

The 2015 NMIS is the second malaria indicator survey to be implemented in Nigeria. It is unique in a number of ways. First, it was implemented one year after the development of the new National Malaria Strategic Plan (2014-2020); it will therefore provide data to evaluate the first year of implementation of the plan and inform developing strategies to guide future implementation. Secondly, the data are disaggregated to provide state-specific indicators, which facilitates the opportunity to develop state-specific malaria control strategies as we move towards malaria elimination. Thirdly, the sample size for the 2015 NMIS is larger than for the 2010 NMIS. It covers a total of 333 clusters across the country (138 clusters in urban areas and 195 clusters in the rural areas), whereas the 2010 NMIS covered 240 clusters.

The 2015 NMIS shows a malaria prevalence of 45 percent by RDT and 27 percent by microscopy. While the ownership of LLINs is 69 percent, 37 percent of the household slept under an LLIN the night before the survey. The survey results show that among women who attended ANC for their most recent pregnancies, only 37 percent received two or more doses of SP. Generally, the data show some improvement in a few indicators; however, they all point to the fact that we need to do more. We must, therefore, re-strategize at the national and state levels to achieve a malaria-free Nigeria by 2020.

I use this opportunity to express appreciation to the National Malaria Elimination Programme, Federal Ministry of Health, National Population Commission, and National Bureau of Statistics for collaborating in the conduct of this important survey. My gratitude also goes to ICF International for providing technical assistance. I thank PMI-USAID, the Global Fund to Fight AIDS, TB and Malaria (GFATM), the United Kingdom Department for International Development (DFID), the United Nations Children's Education Fund (UNICEF), and the World Health Organisation (WHO) for supporting the survey.

I want also to thank the Nigerian people for their willingness to participate in the survey. There is no doubt that the results of the 2015 Malaria Indicator Survey will go a long way towards providing the needed evidence for future planning, review of the national strategic plan, and reprogramming where necessary.



Professor Isaac F. Adewole, FAS, FSPSP, DSc (Hons)
Honourable Minister of Health
Federal Republic of Nigeria

PREFACE

The importance of having appropriate and accurate data for meaningful development planning at all levels of governance cannot be over-emphasized. It is as a result of this, that the Federal Government of Nigeria constitutionally mandated that the National Population Commission (NPopC) generate data on sociodemographic and health issues in the country. In this regard, the United States President's Malaria Initiative (PMI), through ICF International, and in conjunction with the Nigeria Malaria Elimination Programme (NMEP), contracted the Commission to conduct the 2015 Nigeria Malaria Indicators Survey (NMIS).

The 2015 NMIS was implemented by NPopC in collaboration with NMEP and the National Bureau of Statistics (NBS), with technical assistance from ICF International. The baseline survey was conducted in 2010, and the 2015 NMIS was a follow-up survey. The primary objectives of the 2015 NMIS were to provide information on malaria indicators and malaria prevalence at the national level and also in each of the 36 states of the country and the Federal Capital Territory. The survey questions asked about household characteristics, respondent's background, reproduction, pregnancy, intermittent preventive treatment, fever in children, and knowledge of malaria. Haemoglobin was measured and blood was tested for malaria among children age 6-59 months. Children with positive malaria tests were treated with malaria.

The results of the survey will not only provide NMEP with much-needed data, but also will be useful to programme and project managers, and policy makers in government (at national and subnational levels), at development agencies, and in nongovernmental organizations within and outside Nigeria.

On behalf of the Commission, I wish to thank the United States Agency for International Development (USAID), the Global Fund, UK aid, and the World Health Organization (WHO) for their financial contributions toward the execution of the project. I also wish to thank the Board of the National Population Commission and the Director-General for their support and advocacy for the success of the project. Similarly, my gratitude goes to NMEP for the confidence reposed in NPopC to conduct the survey and most especially for the strategic guidance provided by the Survey Management Committee chaired by the National Coordinator, NMEP – Dr. Nnenna Ezeigwe.

I am also grateful to the Survey Implementation Committee, (SIC), chaired by Dr. Perpetua Uhomoibhi and co-chaired by Mr. Bolaji B. Akinsulie, for their leadership role and hard work in the survey implementation. I will not forget the untiring effort and dedication of the Project Coordinator, Ms. Margaret Edet, in the execution of the project. Likewise, I wish to thank all the Work Streams and other SIC members for their technical contributions during the planning and execution of the survey. In addition, I wish to recognize the efforts of the State Coordinators who coordinated and facilitated activities in the field.

The success of the project would not be possible without the valuable contributions of the lab scientists, nurses, interviewers, and other field functionaries. Thank you all.

Chief Eze Durulheoma (SAN)
Chairman,
National Population Commission,
Abuja.

July 2016

ACKNOWLEDGEMENT

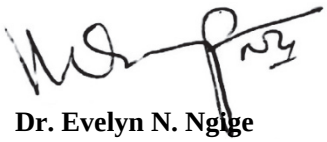
I offer my sincere appreciation to the Honourable Minister of Health, Professor Isaac F. Adewale, FAS, FSPSP, DSc (Hons), and the Honourable Minister of State for Health, Dr. E. Osagie Ehanire, MD, FWACS, for their continued support and encouragement. My appreciation also goes to the Chairman, National Population Commission, Chief Eze Duru-Iheoma (SAN), and the Statistician General, National Bureau of Statistics, Dr. Oyeyemi Kale, PhD, FNSA, for their collaboration in the implementation of the survey.

I acknowledge the efforts of the Permanent Secretary and the National Coordinator, National Malaria Elimination Programme, Federal Ministry of Health, for their leadership and commitment to the success of the survey. I also thank members of the Survey Management Committee and the Survey Implementation Committee for their commitment and dedication to the successful implementation of the survey.

My special thanks go to the National Malaria Elimination Programme (NMEP), Federal Ministry of Health (FMoH); National Population Commission (NPopC); National Bureau of Statistics (NBS); Department of Planning, Research and Statistics (DPRS), Federal Ministry of Health (FMoH); State Ministries of Health; and traditional rulers for their contributions to the success of the survey. I also thank all the laboratories that provided support during the survey, particularly the African Network for Drugs and Diagnostics Initiative (ANDI); the Department of Medical Microbiology and Pathology, College of Medicine, University of Lagos; and the Institute of Tropical Disease Research and Prevention, University of Calabar, Cross River State.

My appreciation also goes to ICF International for providing technical assistance. I sincerely thank PMI-USAID, the Global Fund to Fight AIDS, TB and Malaria (GFATM), the United Kingdom Department for International Development (DFID), and the World Health Organisation (WHO) for supporting the survey.

I am grateful to all the state coordinators and supervisors, quality control officers, national monitors, data collectors, and drivers for their hard work and commitment during the implementation of the survey. Finally I appreciate the Nigerian people for their cooperation and participation in the survey.



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INTRODUCTION 1

1.1 COUNTRY PROFILE

Nigeria lies within sub-Saharan Africa, situated between latitudes 4º16' and 13º53' north and longitudes 2º40' and 14º41' east. It is bordered by the Niger Republic in the north, the Republic of Chad in the northeast, Republic of Cameroon in the east, and Republic of 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. The country derives its name from its most prominent river, the Niger. Nigeria has a total land area of 923,768 square kilometres, making it the 14th 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-South Zone. Other topographic features include the Niger-Benue Trough and Chad Basin.

Nigeria has a tropical climate of wet and dry seasons driven by the movement of the two dominant winds—the rain-bearing southwesterly winds and the cold, dry, and dusty northeasterly winds, usually referred to as the Harmattan. The dry season occurs from October to March, with a spell of 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 outskirts 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 the potential for a wide range of agricultural production.

1.1.1 Country Demographics

Nigeria operates a federal system of government under three arms, namely the Executive, the Legislative, and the Judiciary. It is made up of 36 states and a Federal Capital Territory (FCT). The states are grouped into six geopolitical 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. Politically, Nigeria operates a democratic system of government that has remained stable since 1999. There are about 374 identifiable ethnic groups, of which the major ones are the Igbo, Hausa, and Yoruba.

Nigeria has the largest population in Africa and the seventh largest in the world. The current population is estimated at 177.1 million based on an annual growth rate of 3.2 percent (National Population Commission [NPopC] 2016). Nigeria's population is young, with persons age 0-24 accounting for more than 62 percent of the country's residents (NPopC 2006). According to the World Bank's definition, Nigeria is a lower middle income country (World Bank 2016).

The Federal Ministry of Health's target population for this survey included children age 0-59 months and women of reproductive age (15-49 years). Table 1.1 presents the most recent data for selected development indicators for the survey target population. Data from the past two decades show that children under age 5 constitute 16 percent of the total population, and women age 15 to 49 represent more than half of the entire

female population. There have been insignificant declines in fertility, from a total fertility rate (TFR) of 6.0 in 1990 to 5.7 in 2003 and 2008 and 5.5 in 2013 (NPopC and ICF International 1990, 2003, 2008, 2013). The maternal mortality ratio (MMR), first reported in the 2008 NDHS, was 545 deaths per 100,000 live births in 2008, increasing to 576 deaths per 100,000 live births in 2013. According to NDHS data, the infant mortality rate (IMR) decreased from 100 deaths per 1,000 live births in 2003 to 69 deaths per 1,000 live births in 2013. The under-5 mortality rate decreased from 201 deaths per 1,000 live births to 128 deaths per 1,000 live births between 2003 and 2013.

Table 1.1 Selected development indicators for Nigeria

Population (millions)	188[a]
Annual population growth rate (percent)	3.2[a]
Total fertility rate (per woman)	5.5[b]
Infant mortality rate (per 1,000 live births)	64[b]
Under-5 mortality rate (per 1,000 live births)	128[b]
Maternal mortality ratio (per 100,000 live births)	576[b]
Life expectancy at birth (years)	54[c]

[a] NPopC 2011
[b] NDHS 2013
[c] Central Intelligence Agency 2015

1.1.2 Health System

The country's health system comprises the public and private health sectors. The private sector is made up of the formal private health care sector, which includes private not-for-profit (operated by missionaries and nongovernmental organisations) and private for-profit organisations, and the informal sector, which includes traditional medicine providers, patent medicine vendors, drug shops, and complementary and alternative practitioners. Public sector health care facilities include large referral hospitals, classified as tertiary health facilities; secondary health facilities; and primary health facilities. Primary health centres (PHC) provide basic preventive, curative, promotive, and rehabilitative health care services for most of the rural population. Also included in the primary health care system are community-oriented resource persons (CORPS), who treat children under age 5 for malaria, pneumonia, and diarrhoea at the community level. They also participate in health promotion programmes such as immunisation, family planning, and long-lasting insecticidal mosquito net (LLIN) distribution campaigns.

1.1.3 National Health Policy

The National Health Policy is designed to support implementations of health-related programmes and interventions as well as regulation of the health care system. The first National Health Policy was formulated in 1988, targeted to achieve quality health for all Nigerians. Due to emerging issues, realities, and trends, a review of this policy became necessary, and a revised version was launched in 2004 (Federal Ministry of Health [FMoH] 2004). The revised policy's long-term goal is to provide adequate access to primary, secondary, and tertiary care services for all Nigerian people through a functional referral system. A review of the National Health Policy is ongoing.

1.1.4 Integrated Maternal, Newborn, and Child Health Strategy

The Integrated Maternal, Newborn, and Child Health Strategy was developed by the Federal Ministry of Health in 2007 to enhance Nigeria's opportunities to achieve Millennium Development Goals (MDGs) 4 and 5, which respectively aim to reduce child mortality and to improve maternal health. However, the Sustainable Development Goal for health (SDG 3.1) sets the target for maternal mortality reduction at less than 70 per 100,000 live births by 2030.

1.1.5 National Health Act

The National Health Act was signed into law by Nigeria's immediate past president, Goodluck Jonathan, on 9 December 2014. The aim of the act is to establish a framework for regulation, development, and management of a national health system and to set standards for rendering health services in the federation and other related matters. The legislation was also enacted for the purpose of providing health care insurance to the deprived segment of the population. In addition, it was designed to help Nigeria reduce maternal and infant mortality rates by providing access to free delivery services to more pregnant women and by ensuring that children have access to standard paediatric services in the nation's health facilities.

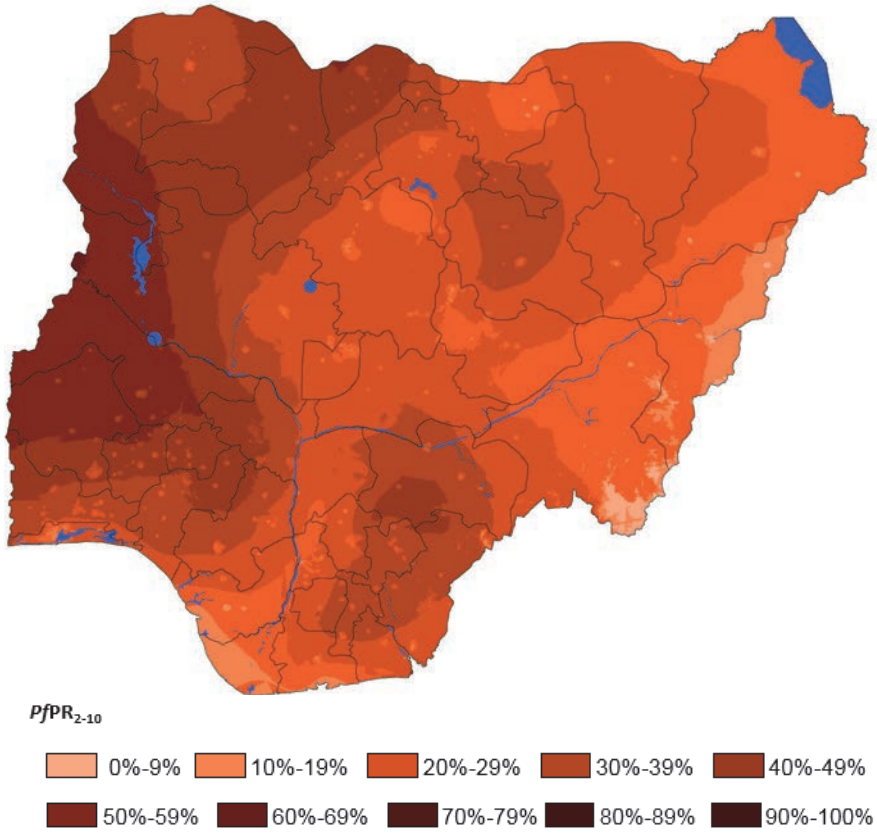
1.2 Background on Malaria in Nigeria

Malaria is endemic in Nigeria and remains a major public health problem, taking its greatest toll on children under age 5 and pregnant women, although it is preventable, treatable, and curable. Africa still bears over 80 percent of the global malaria burden, and Nigeria accounts for about 29 percent of this burden. Moreover, in combination with the Democratic Republic of Congo, Nigeria contributes up to 40 percent of the global burden (World Malaria Report 2014). In Nigeria, malaria is responsible for approximately 60 percent of outpatient visits and 30 percent of admissions. It is also believed to contribute up to 11 percent of maternal mortality, 25 percent of infant mortality, and 30 percent of under-5 mortality. It is estimated that about 110 million clinically diagnosed cases of malaria and nearly 300,000 malaria-related childhood deaths occur each year. The disease overburdens the already-weakened health system and exerts a severe social and economic burden on the nation, retarding the gross domestic product (GDP) by 40 percent annually and costing approximately 480 billion naira in out-of-pocket treatments, prevention costs, and loss of man hours (FMoH and National Malaria Elimination Programme [NMEP] 2014).

1.2.1 Malaria Transmission

Nigeria's climatic conditions make it suitable for perennial malaria transmission. Previously, it was estimated that approximately 30 percent of the population live in areas of high to very high transmission intensity and that 67 percent reside in the moderate transmission zone (FMoH 2009). However, there is new evidence of a progressive divergence of in-country variations in malaria endemicity. Recent reports indicate that 85 percent of Nigerians live in areas of mesoendemic transmission, and only 15 percent live under conditions of hyper-holoendemic transmission. There are conditions of hypoendemic transmission in areas of the FCT, Adamawa, and Borno. Also, a malaria transmission intensity mapping study using several data sources and geostatistical modelling techniques has shown changes in parasite risk patterns during the past decade, with parasite risks falling in 19 of the 36 states and the FCT. The study showed a 50 percent reduction in malaria morbidity in these areas (Snow et al. 2013).

Figure 1.1 **2010 predicted mean *Pf*PR$_{2-10}$ binned 10 groups**



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 in Nigeria: (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, being perennial in duration in most of the South but lasting 3 months or less in the northeastern region around the Chad Basin.

In Nigeria, the dominant vector species are *Anopheles gambiae* species and the *A. funestus* group, with some other species playing a minor or local role: *A. moucheti, A. nili, A. melas, A. pharaoensis*, and *A. coustani*. *A. gambiae* is the most dominant throughout the country, while *A. arabiensis* is mostly found in the North and *A. melas is* found only in the mangrove coastal zone.

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

1.2.2 National Malaria Policy

The National Malaria Policy, launched in February 2015, expresses the desire and commitment of the government of Nigeria at all levels to ensure the elimination of malaria. The policy was conceived within the context of a malaria-free Nigeria and addresses core issues related to malaria prevention, diagnosis, and treatment; communication and social mobilisation; and regulations regarding antimalarial commodities. Its aim is to provide equitable, comprehensive, cost-effective, efficient, and quality malaria elimination services while ensuring transparency, accountability, client satisfaction, and community ownership and partnership.

1.2.3 Strategic Direction for Malaria Control

The Malaria Control Programme was established in 1948 as Nigeria Malaria Services, basically for research purposes. It was later incorporated into the Department of Primary Health and Disease Control (now the Department of Public Health) in 1986 as the National Malaria and Vector Control Division. To reflect the country's vision of a malaria-free Nigeria, the National Malaria Control Programme was renamed the National Malaria Elimination Programme (NMEP) in 2013.

Over the years, Nigeria has implemented three National Malaria Strategic Plans (NMSPs) and is currently in the midst of a fourth plan, as follows:

- **2001-2005:** Developed after the African Summit on Roll Back Malaria to build partnerships and garner political will
- **2006-2010:** Addressed vulnerable populations (pregnant women, children less than age 5, people living with HIV/AIDS) as primary target groups for interventions
- **2009-2013:** Provided a road map for malaria control in Nigeria, focusing on universal and equitable access and rapid scale up of a package of core interventions
- **2014-2020:** Aims to achieve pre-elimination status (less than 5,000 cases per 100,000 persons) and reduce malaria-related deaths to zero by 2020

The seven objectives driving the 2014-2020 NMSP are outlined below.

1. ***To provide at least 80 percent of the targeted population with appropriate preventive measures by 2020:*** Core technical strategies here include expanding universal access to insecticide-treated materials. This will involve sustained mass distribution of long-lasting insecticidal nets (LLINs), significant scaling up of indoor residual spraying (IRS), and expansion of larval source management (larviciding and environmental management). There will also be support for intermittent preventive therapy during pregnancy (IPTp) and seasonal malaria chemoprevention (SMC).

2. ***To test all care-seeking persons with suspected malaria using rapid diagnostic testing (RDT) or microscopy by 2020:*** This will be through a massive scale up in the availability of facilities for parasitological confirmation (RDT and/or microscopy) at all levels (including the private sector and community systems) of health care delivery in the country. Policies will be updated as necessary, and there will be systems in place to ensure the quality of diagnostic products.

3. ***To treat all individuals with confirmed malaria seen in private or public facilities with effective antimalarial medicines by 2020:*** This will be achieved by promoting the availability of appropriate antimalarial medicines through free, subsidised, or commercial systems. Malaria management will also be delivered through community systems using malaria case management as the driver for the integrated community case management of childhood illness (iCCM) and the Ward Minimum Health Package. Secondary- and tertiary-level health facilities will be strengthened to deliver on the treatment objectives for severe malaria, while community-level interventions will focus on pre-referral treatment and improved referral systems.

4. ***To provide adequate information to all Nigerians such that at least 80 percent of the populace habitually takes appropriate malaria preventive and treatment measures as necessary by 2020:*** Evidence-based innovative behavioural change communication messages delivered through multiple platforms targeting both health workers and the general public will drive efforts at pursuing

the attainment of this objective. There will be advocacy targeting policymakers and stakeholders, and social mobilisation will be highly promoted.

5. ***To ensure the timely availability of appropriate antimalarial medicines and commodities required for prevention and treatment of malaria in Nigeria wherever they are needed by 2018:*** Forecasting and quantification will be strengthened and efforts will be made to ensure that effective and efficient distribution systems, which are dependent on the completeness of logistical management information systems, are in place. There will also be partnerships with key government agencies to strengthen and update malaria-related regulatory policies and the conduct of pharmacovigilance.

6. ***At least 80 percent of health facilities in all LGAs report routinely on malaria by 2020:*** This will be achieved through a stronger emphasis on the use of information and communications technology (ICT) platforms and deployment of the district health information system (DHIS) and the health management information system (HMIS). The use of short message service (SMS) platforms for feeding information from peripheral facilities to central systems will be introduced. Supervision and coordination activities to enhance completeness of reporting from facilities will be strengthened. Capacity in terms of monitoring and evaluation will emphasise special pre-elimination needs in the areas of surveillance and reporting. A robust monitoring and evaluation framework has been developed to guide the scheduling of data collection processes.

7. ***To strengthen governance and coordination of all stakeholders for effective programme implementation towards an "A" rating by 2018 on a standardised scorecard:*** Building on the existing gains of the partnership arrangement, the Programme's management will promote human capacity development, ensure public-private partnerships in facilitating the availability and use of antimalarial commodities, and strengthen governance through the use of electronic dashboards.

The implementation of this plan aims at attaining universal coverage levels for major interventions over the first 5 years and consolidating on these levels over the Strategic Plan's next 2 years in order to achieve malaria pre-elimination status.

1.3 OBJECTIVES OF THE 2015 NIGERIA MALARIA INDICATOR SURVEY

The 2014-2020 National Malaria Strategic Plan is a 7-year major scale up of key interventions resulting from a robust evidence-based data and programme experiences from previous years. The Strategic Plan aims to achieve pre-elimination status and reduction of malaria-related deaths to zero by 2020 in Nigeria. The 2015 Nigeria Malaria Indicator Survey (NMIS), a follow-up to the baseline survey conducted in 2010, was designed to assess the extent of achievements of the 2009-2013 NMSP goals and targets and to provide information for monitoring and evaluation of Nigeria's National Malaria Elimination Programme in the next 10 years. The primary objectives of the 2015 NMIS are to provide information on malaria indicators and malaria prevalence, both at the national level and in each of the country's 36 states and the Federal Capital Territory. The secondary objectives are to improve knowledge regarding best practices in implementing the survey and enhance the skills of survey-implementing partners in the areas of survey design, training, logistics, data collection monitoring, data processing, laboratory testing, analysis, report drafting, and data dissemination.

Other key objectives of the 2015 Nigeria Malaria Indicator Survey are to:

- Measure the extent of ownership and use of mosquito nets
- Assess the coverage of preventive treatment programmes for pregnant women

- Identify practices used to treat malaria among children under age 5 and the use of specific antimalarial medications
- Measure the prevalence of malaria and anaemia among children age 6-59 months
- Assess knowledge, attitudes, and practices regarding malaria in the general population

1.4 METHODOLOGY OF THE NIGERIA MALARIA INDICATOR SURVEY

The 2015 NMIS was implemented by the National Malaria Elimination Programme (NMEP), the National Population Commission (NPopC), the National Bureau of Statistics (NBS), and the Malaria Partnership in Nigeria. It was carried out during October and November 2015 with a nationally representative sample of more than 8,000 households in 329 clusters. All women age 15-49 in these households were eligible for individual interviews. During the interviews, respondents were asked questions about malaria prevention during pregnancy and treatment of fever among their children. Children age 6 to 59 months were tested for anaemia and malaria using finger- or heel-prick blood samples. Results were available immediately and were provided to the children's parents or guardians. In addition, thick blood smears and thin films were made in the field and transported to the African Network for Drugs and Diagnostics Innovation (ANDI) Centre of Excellence for Malaria Diagnosis, 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.

Funding for the 2015 NMIS was provided by the United States President's Malaria Initiative (PMI); the Global Fund to Fight AIDS, Tuberculosis, and Malaria; the United Kingdom Department for International Development (DFID) through the Support to Nigeria Malaria Program (SuNMaP); and the World Health Organisation (WHO). ICF International provided technical assistance as well as funding through the DHS Program, a project funded by the United States Agency for International Development (USAID) that offers support and technical assistance in the implementation of population and health surveys in countries worldwide.

1.4.1 Survey Organisation

A national Survey Management Committee (SMC), comprising high-level representatives of key partner organisations under the chairmanship of the NMEP National Coordinator, oversaw the general administration and management of the NMIS and provided strategic guidance and approving authority for the 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 (NHREC).

The Survey Implementation Committee (SIC) was responsible for the implementation of the 2015 NMIS. It consisted of 22 technical officers from the survey-implementing agencies and partner organisations, with NMEP serving as the chair and NPopC serving as co-chair. More specifically, the SIC was responsible for finalisation of survey instruments and tools; recruitment, training, and monitoring of field staff; 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 provided the technical support team: the survey coordinator, the sampling specialist, the survey manager, the data processing specialist, and the biomarker laboratory science specialist. These individuals assisted with overall survey design, sample design, questionnaire design, procurement of field supplies and materials, field staff training, fieldwork

monitoring, collection of biomarkers (anaemia testing, rapid diagnostic testing for malaria, and making and reading blood smears), data processing, data analysis, and report preparation.

Also, 19 quality control officers were deployed across the 36 states and the FCT to ensure compliance with the agreed-upon data collection protocol. They conducted monitoring activities for a total of 22 days and revisited four households in selected clusters with a specially designed questionnaire to double check responses and coverage.

In addition, 18 high-ranking personnel, including the NMEP National Coordinator (who was also the chief investigator of the survey) and the Chairman and Director-General of NPopC, were engaged in the survey to ensure that data quality was not compromised.

1.4.2 Sample Design

The sample for the 2015 NMIS was designed to provide most of the survey indicators for the country as a whole, for urban and rural areas separately, and for each of the country's six geopolitical zones. Some of these indicators are provided for each of the 36 states and the FCT. Nigeria's geopolitical zones are as follows:

1. **North Central:** Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, and FCT
2. **North East:** Adamawa, Bauchi, Borno,[1] 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 for the 2015 NMIS was the 2006 National Population and Housing Census (NPHC) of the Federal Republic of Nigeria, conducted by the National Population Commission. 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 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 2015 NMIS, was defined on the basis of EAs from the 2006 EA census frame.

A two-stage sampling strategy was adopted for the 2015 NMIS. In the first stage, nine clusters (EAs) were selected from each state, including the FCT. The sample selection was done in such a way that it was representative of each state. The result was a total of 333 clusters throughout the country, 138 in urban areas and 195 in rural areas.

A complete listing of households was conducted, and a mapping exercise for each cluster was carried out in June and July 2015, with the resulting lists of households serving as the sampling frame for the selection of households in the second stage. All regular households were listed. The NPopC listing enumerators used global positioning system (GPS) receivers to record the coordinates of the 2015 NMIS sample clusters.

[1]Due to the state of insecurity in Borno State during the data collection period, fieldwork was completed in only urban areas; thus, estimates for national indicators and indicators in the North East Zone do not include rural clusters in Borno State.

In the second stage of the selection process, 25 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 2015 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. This sample size was selected to guarantee that key survey indicators could be produced for each of the country's six geopolitical zones, with approximately 1,338 women in each zone expected to complete interviews. In order to produce some of the survey indicators at the state level for each of the 36 states and the FCT, interviews were expected to be completed with approximately 217 women per state.

1.4.3 Questionnaires

Three questionnaires were used in the survey: the Household Questionnaire; the Woman's Questionnaire, which was administered to all women age 15-49 in the selected households; and the Biomarker Questionnaire. These questionnaires were adapted to reflect the population and health issues relevant to Nigeria during a series of meetings with various stakeholders from the NMEP and other government ministries and agencies, nongovernmental organisations, and international donors. In addition to English, the questionnaires were translated into the three major Nigerian languages: Hausa, Igbo, and Yoruba. The questionnaires were programmed on tablet computers, and interviewers administered the survey using computer-assisted personal interviewing (CAPI).

The **Household Questionnaire** was used to list all of the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, education, and relationship to the head of the household. Data on age and sex were used to identify women who were eligible for the individual interview. 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 of the house, ownership of various durable goods, and ownership and use of mosquito nets.

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 (e.g., education, media exposure)
- 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, drugs used in treatment)

The **Biomarker Questionnaire** was used to record the results of the anaemia and malaria testing as well as the signatures of the fieldworker and the respondent who gave consent.

1.4.4 Anaemia and Malaria Testing

The 2015 NMIS collected finger- or heel-prick blood samples from children age 6-59 months to perform on-the-spot testing for anaemia and malaria and to prepare thick and thin blood smears to be read in the laboratory to detect the presence of *Plasmodium* parasites and determine the parasite species. Each field team included one laboratory scientist who carried out the anaemia and malaria testing and prepared the blood smears and a nurse who provided malaria medications for children testing positive in accordance with the appropriate treatment protocols. Written informed consent for each test was granted by the child's parent or guardian before tests were

conducted. The survey protocol, including blood specimen collection and analysis, was approved by ICF International's Institutional Review Board, and by the Nigeria National Health Research Ethics Committee (NHREC).

Anaemia testing. Due to the strong correlation between malaria infection and anaemia, the 2015 NMIS included anaemia testing for children age 6-59 months. Finger- or heel-prick blood samples were drawn with a single-use retractable, spring-loaded, sterile lancet. Health technicians then collected blood in a microcuvette from the finger or heel prick. Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue® analyser, which produces a result in less than 1 minute. Results were given to the child's parent or guardian verbally and in writing. Parents of children with a haemoglobin level below 8 g/dl were advised to take the child to a health facility for follow-up care and were given a referral letter with the haemoglobin reading to show staff at the health facility. Results of the anaemia test were recorded on the Biomarker Questionnaire, and a brochure explaining the causes and prevention of anaemia was left in the household.

Malaria testing using rapid diagnostic testing (RDT). Using the same finger (or heel) prick used for anaemia testing, a drop of blood was tested immediately with the SD BIOLINE Malaria Ag P.f (HRP-II)™ (Standard Diagnostics, Inc.) rapid diagnostic test, which is a qualitative test to detect histidine-rich protein II antigen of *Plasmodium falciparum* (*Pf*) in human whole blood. *P. falciparum* is the primary cause of malaria in Nigeria. The test includes a disposable sample applicator that comes in a standard package. A tiny volume of blood is captured on an applicator and placed in the well of the testing device. All field laboratory scientists were trained to perform the RDT in the field according to the manufacturer's instructions. The laboratory scientists read, interpreted, and recorded RDT results after 15 minutes. The RDT results were recorded as either positive or negative, with faint test lines being considered positive. As with the anaemia testing, malaria RDT results were provided to the child's parent or guardian in oral and written form and were recorded on the Biomarker Questionnaire. Children whose malaria RDT results were positive were offered a full course of treatment according to the Nigeria national malaria treatment guidelines, provided they were not currently on treatment with artemisinin-based combination therapy (ACT) and had not completed a full course of ACT during the preceding 2 weeks. To ascertain the correct dose, nurses on each field team were provided with treatment guidance charts and were instructed to ask about signs of severe malaria and about any medications the child might already be taking. The nurses then provided the age-appropriate dose of ACT along with instructions on how to administer the medicine to the child.[2]

Malaria testing using blood smears. In addition to the RDT, thick and thin blood smears were prepared in the field. Each blood smear slide was given a bar code label, with a duplicate affixed to the Biomarker Questionnaire. An additional copy of the bar code label was affixed to a blood sample transmittal form to track the blood samples from the field to the laboratory. The slides were dried in a dust-free environment and stored in slide boxes. The laboratory scientists fixed the thin smears in the field at the end of each day by dipping the slide in absolute methanol. The thick and thin smear slides were collected regularly from the field, along with the completed questionnaires, and transported to zonal staining sites for staining, after which they were taken to the ANDI Centre of Excellence for Malaria Diagnosis, College of Medicine, University of Lagos for logging

[2] Dosage of ACT was based on the age of the recipient. The proper dosage for a child age 6 months to 3 years is one tablet of artemether-lumefantrine (co-formulated tablets containing 20 mg of artemether and 120 mg of lumefantrine) to be taken twice daily for 3 days, while the dosage for a child age 4-7 years is two tablets of artemether-lumefantrine to be taken twice daily for 3 days. Artesunate-amodiaquine was also used. For children age 2-11 months, co-formulated tablets containing 25 mg of artesunate and 67.5 mg of amodiaquine were given to be taken once daily for 3 days. For children age 1-5, co-formulated tablets containing 50 mg of artesunate and 135 mg of amodiaquine were given to be taken once daily for 3 days.

and microscopic reading. Thick smears were first examined to determine the presence of *Plasmodium* infection. Thin smears for all positive thick smears were then read to determine the *Plasmodium* parasite species.

1.4.5 Training of Field Staff

Two levels of training on survey techniques and field procedures were conducted to prepare all field staff and survey personnel. The first level of training, which took place from 29 June to 10 July 2015, was the training of the trainers and the pretesting of the survey instruments and adopted techniques. This first stage involved the state coordinators who were senior officers from the three main implementing agencies (NMEP, NPopC, and NBS), other stakeholders, and laboratory scientists who assisted in the training for the main survey.

For the main training, which took place during a 3-week period in September 2015, NMEP, NPopC, and NBS recruited and trained 287 people for the fieldwork. They served as supervisors (team leaders), interviewers, nurses, laboratory scientists, state coordinators, reserve interviewers, quality control officers, information technology (IT) officers, and other central coordinators. The training course consisted of instruction regarding interviewing techniques and field procedures, a detailed review of items on the questionnaires, use of CAPI, instruction for administering and obtaining parental/guardian consent to test children for anaemia and malaria, mock interviews between participants in the classroom, and practice interviews with real household respondents in areas outside the 2015 NMIS sample points. Forty-two laboratory scientists were provided 3 weeks of instruction and practice in collecting blood samples from children under age 5. Forty-one nurses who were trained as interviewers were also trained to offer and administer treatment to children with positive RDT results. Forty team supervisors underwent additional training in supervisor CAPI responsibilities and fieldwork coordination. Thirty-seven supervisors, 111 interviewers (of whom 37 were nurses), and 37 laboratory scientists were selected for the 37 field teams. Nineteen state coordinators, 19 quality control officers, one central lab coordinator, and two general central coordinators were engaged to coordinate and monitor state teams and respond to field challenges. The state coordinators were also responsible for transferring slides to zonal staining sites. In addition, 16 lab scientists from eight zonal staining centres were trained on the 2015 NMIS blood smear staining protocol during a 2-day centralised training session in September 2015 at the ANDI Centre of Excellence for Malaria Diagnosis, College of Medicine, University of Lagos.

1.4.6 Data Collection

Thirty-seven interviewing teams carried out data collection for the 2015 NMIS. Each team consisted of one supervisor, two interviewers (one of whom was a nurse), a laboratory scientist, and one driver. Nineteen field coordinators from NMEP, NPopC, NMEP, and some of the Roll Back Malaria (RBM) partners coordinated and supervised fieldwork activities, supported by two central coordinators. Three ICF International staff (the survey manager, the data processing specialist, and the biomarker specialist) also monitored fieldwork. Data collection took place during October and November 2015.

1.4.7 Data Processing

Data for the 2015 NMIS were collected through questionnaires programmed onto tablet computers. The computers were programmed by an ICF data processing specialist and loaded with the Household, and Woman's Questionnaires in English and the three major local languages. The tablets were Bluetooth-enabled to facilitate electronic transfer of files, for example, transfer of data from the Household Questionnaires among survey team members and transfer of completed questionnaires to the team supervisor's tablets. The field supervisors transferred data on a daily basis to the central data processing office using the Internet. To facilitate communication and monitoring, each field worker was assigned a unique identification number.

Two data management officers were positioned at the central data office to monitor and supervise daily submission of completed interview data from teams. They also provided technical assistance on the functioning of the tablets and constantly liaised with the central coordination and ICF teams to manage data transfers from the field teams to the central office. They made intermittent visits to assist field teams with serious situations that could not be resolved at the central office, either to replace or fix the tablets.

The Census Survey Processing (CSPro) software program was used for data editing, weighting, cleaning, and tabulation. In the NPopC central office, data received from the supervisors' tablets were registered and checked for any inconsistencies and outliers. Data editing and cleaning included structure and internal consistency checks to ensure completeness of work in the field. Any anomalies were communicated to the respective team through field coordinators and the team supervisor. Corrected results were re-sent to the central processing unit. Data processing was completed during the first week of December 2015.

1.4.8 Response Rates

The household and individual response rates for the 2015 NMIS are shown in Table 1.2. A total of 8,148 households were selected for the sample. This does not include six rural clusters in Borno State and one cluster in Plateau State that were dropped from the sample due to security concerns. Of the households selected, 7,841 were occupied. Of the occupied households, 7,745 were successfully interviewed, yielding a response rate of 99 percent. The response rate among households in rural areas was slightly higher (99 percent) than that among households in urban areas (98 percent). No clusters in rural areas of Borno State were visited; thus, estimates for national indicators and indicators in the North East Zone do not include rural Borno State.

Table 1.2 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Nigeria 2015

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	3,400	4,748	8,148
Households occupied	3,231	4,610	7,841
Households interviewed	3,166	4,579	7,745
Household response rate[1]	98.0	99.3	98.8
Interviews with women age 15-49			
Number of eligible women	3,221	4,885	8,106
Number of eligible women interviewed	3,200	4,834	8,034
Eligible women response rate[2]	99.3	99.0	99.1

Note: National estimates do not include rural areas of Borno State.
[1] Households interviewed/households occupied
[2] Respondents interviewed/eligible respondents

In the interviewed households, 8,106 women were identified as eligible for individual interviews. Interviews were completed with 8,034 women, yielding a response rate of 99 percent. The response rate among eligible women did not differ by residence (urban or rural).

CHARACTERISTICS OF HOUSEHOLDS 2

This chapter presents summary information on the basic demographic and socioeconomic characteristics of the households interviewed in the 2015 NMIS. A household is defined as a person or a group of persons, related or unrelated, who live together, have common cooking and eating arrangements, and acknowledge one adult member as the head of the household. 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 analysis of the results for either the de jure (usual) or de facto (those who are there at the time of the survey and slept at the household the previous night) population. 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, described later 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 2015 NMIS is shown in Table 2.1 by 5-year age groups, according to sex and residence. Information was collected for more than 37,000 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, with no differences in the ratio in rural and urban areas (100 and 99, respectively). The proportion of the population in each age group declines as age increases; the youngest age group (less than age 5) accounts for the largest proportion of the population (19 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

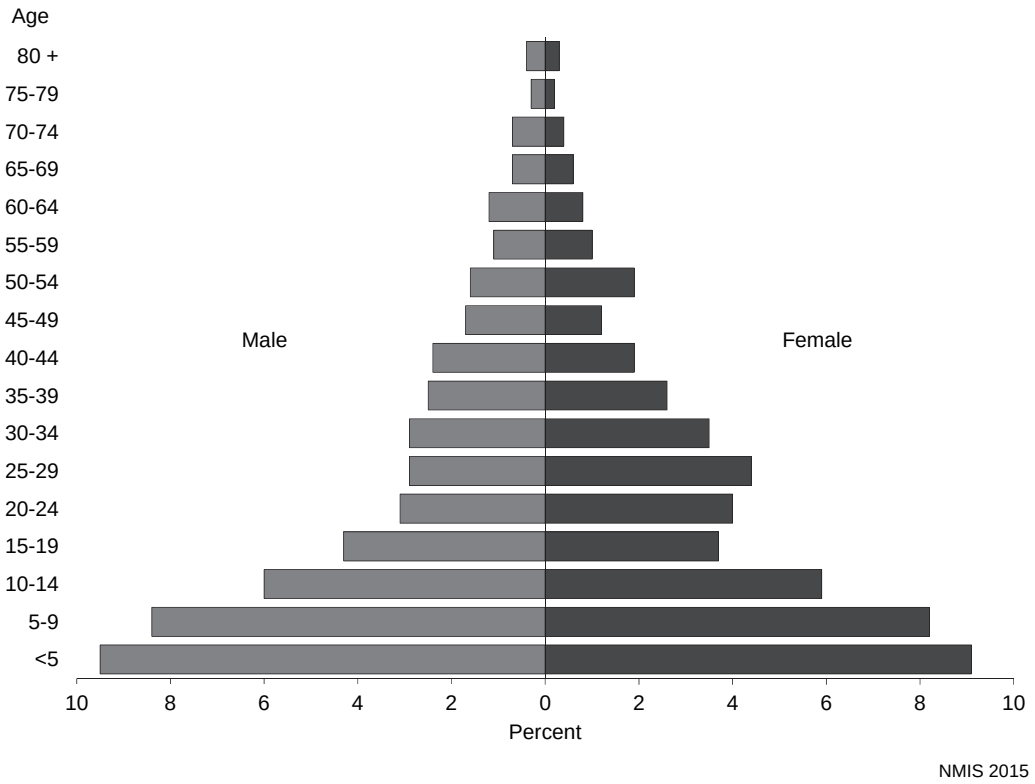
Percent distribution of the de facto household population by 5-year age groups, according to sex and residence, Nigeria 2015

	Urban			Rural					
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	17.2	16.2	16.7	20.0	19.3	19.6	19.0	18.1	18.5
5-9	15.2	15.6	15.4	17.9	16.9	17.4	16.9	16.4	16.7
10-14	12.3	12.2	12.2	11.8	11.7	11.8	12.0	11.9	11.9
15-19	9.4	7.5	8.5	8.1	7.2	7.7	8.6	7.3	8.0
20-24	6.3	7.6	6.9	6.0	8.4	7.2	6.1	8.1	7.1
25-29	6.1	8.7	7.4	5.8	8.8	7.3	5.9	8.7	7.3
30-34	5.9	7.8	6.9	5.8	6.5	6.1	5.8	7.0	6.4
35-39	5.8	5.8	5.8	4.6	4.7	4.7	5.0	5.1	5.1
40-44	5.5	4.2	4.9	4.5	3.6	4.1	4.9	3.9	4.4
45-49	4.0	2.7	3.3	3.0	2.3	2.6	3.3	2.4	2.9
50-54	3.4	3.7	3.6	3.1	3.9	3.5	3.2	3.8	3.5
55-59	2.0	2.3	2.2	2.2	1.8	2.0	2.1	2.0	2.1
60-64	2.2	1.5	1.9	2.4	1.6	2.0	2.4	1.6	2.0
65-69	1.6	1.3	1.4	1.3	1.0	1.2	1.4	1.1	1.3
70-74	1.2	0.9	1.0	1.4	0.8	1.1	1.3	0.8	1.1
75-79	0.5	0.6	0.5	0.7	0.5	0.6	0.6	0.5	0.6
80+	0.7	0.9	0.8	1.0	0.6	0.8	0.9	0.7	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	6,978	7,042	14,021	11,801	11,853	23,654	18,779	18,896	37,674

Notes: Total includes 262 persons whose age is not known. National estimates do not include rural areas of Borno State.

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."

Figure 2.1 **Population pyramid**



The broad base of the pyramid indicates that Nigeria's population is young. This scenario is typical of countries with high fertility rates.

2.2 HOUSEHOLD COMPOSITION

Information on key aspects of the composition of the households, including 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 (12 percent). There has not been any change in the proportion of female-headed households since the 2010 NMIS (15 percent).

Table 2.2 shows that the average household size is 4.9 persons, as compared with 5.2 persons in the 2010 NMIS. The average household size is lower in urban areas (4.6 persons) than in rural areas (5.1 persons). The proportion of households with nine or more members is 11 percent, compared with 14 percent in 2010. The percentage is higher in rural areas (13 percent) than in urban areas (8 percent).

Table 2.2 Household composition

Percent distribution of households by sex of head of household and by household size, and mean size of household, according to residence, Nigeria 2015

Characteristic	Residence		Total
	Urban	Rural	
Household headship			
Male	81.1	88.3	85.4
Female	18.9	11.7	14.6
Total	100.0	100.0	100.0
Number of usual members			
1	13.7	10.1	11.5
2	10.8	11.2	11.0
3	16.2	13.3	14.5
4	14.5	13.4	13.8
5	14.6	13.7	14.0
6	10.8	11.4	11.1
7	7.0	8.2	7.7
8	4.4	6.0	5.4
9+	8.1	12.7	10.9
Total	100.0	100.0	100.0
Mean size of households	4.6	5.1	4.9
Number of households	3,083	4,662	7,745

Notes: Table is based on de jure household members, i.e., usual residents. National estimates do not include rural areas of Borno State.

2.3 HOUSEHOLD ENVIRONMENT

The physical characteristics of a household's dwelling unit 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; types of cooking fuel, flooring, roofing, and walls; and number of sleeping rooms and 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

Nigeria is a signatory to the 2015 Sustainable Development Goals (SDGs), which emphasise universal and equitable access to safe and affordable drinking water for all (United Nations General Assembly 2001 and 2015). Table 2.3 shows the percent distribution of households and the de jure 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 of drinking water and time to obtain drinking water, according to residence, Nigeria 2015

Characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	***89.3***	***59.4***	***71.3***	***88.7***	***58.0***	***69.5***
Piped water into dwelling/yard/plot	6.7	2.7	4.3	7.9	3.1	4.9
Piped water to neighbour	1.4	0.6	0.9	1.3	0.6	0.9
Public tap/standpipe	7.0	4.9	5.7	7.8	4.6	5.8
Tube well/borehole	40.2	32.0	35.3	40.4	32.2	35.3
Protected dug well	11.0	10.5	10.7	10.8	10.6	10.7
Protected spring	0.8	1.5	1.2	0.5	1.5	1.1
Rainwater	3.9	3.4	3.6	3.6	2.8	3.1
Bottled/sachet water, improved source for cooking/washing[1]	18.3	3.8	9.6	16.4	2.6	7.7
Non-improved source	***10.6***	***40.6***	***28.6***	***11.2***	***41.9***	***30.5***
Unprotected dug well	3.5	16.7	11.5	4.6	19.4	13.9
Unprotected spring	1.2	7.3	4.9	1.0	6.7	4.6
Tanker truck/cart with drum	1.8	0.4	0.9	1.8	0.3	0.9
Surface water	2.0	15.5	10.1	1.8	15.0	10.1
Bottled/sachet water, non-improved source for cooking/washing[1]	2.1	0.7	1.2	2.0	0.5	1.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Time to obtain drinking water (round trip)						
Water on premises	47.7	29.1	36.5	47.9	29.4	36.3
Less than 30 minutes	39.2	53.5	47.8	38.9	52.9	47.7
30 minutes or longer	7.8	14.4	11.8	8.3	14.8	12.4
Don't know/missing	5.3	3.0	3.9	4.9	2.9	3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	3,083	4,662	7,745	14,129	23,832	37,962

Note: National estimates do not include rural areas of Borno State.
[1] Because the quality of bottled/sachet water is not known, households using bottled water for drinking are classified as using an improved or non-improved source according to their water source for cooking and washing.

Seventy-one percent of Nigerian households have an improved source of drinking water. Urban households (89 percent) are much more likely than rural households (59 percent) to use an improved drinking water source. The most common single source of drinking water is a tube well or borehole (40 percent of urban households and 32 percent of rural households). It should be noted that 11 percent of all households report using bottled or sachet water as their main source of drinking water. Due to the fact that the quality of bottled or sachet water is not always known, households using bottled or sachet water for drinking are classified as using an improved or non-improved source according to their water source for cooking and washing. Eighteen percent of urban households and 4 percent of rural households report using bottled or sachet water and having an improved source of water for cooking and washing. The drinking water data from the 2015 NMIS and the 2010 NMIS are not directly comparable because the additional question on source of water for cooking and washing was not asked in 2010 for households that reported using bottled or sachet water as their main source of drinking water.

Forty-one percent of rural households obtain drinking water from non-improved sources, with 17 percent obtaining water from an unprotected dug well and 16 percent obtaining their drinking water from surface water (lakes and ponds, rivers, and streams). On the other hand, only 11 percent of urban households use an unimproved water source.

2.3.2 Household Sanitation Facilities

A clean, hygienic environment is essential to healthy living. Every year millions of people, most of them children, die from diseases associated with an inadequate water supply and inadequate sanitation and hygiene. Poor water quality and inadequate sanitation have a negative impact on food security and livelihood. Households

without proper sanitation facilities are more exposed to the risk of diseases such as dysentery, diarrhoea, and typhoid fever than those with improved sanitation facilities.

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 waste from human contact (WHO/UNICEF 2016).

Table 2.4 presents data on the types of toilet or latrine facilities used by households. Thirty-one percent of Nigerian households use an improved toilet facility (43 percent of urban households and 23 percent of rural households). Twenty percent of households share facilities with other households, while about half (49 percent) use non-improved facilities (25 percent of urban households and 66 percent of rural households) (see Figure 2.2).

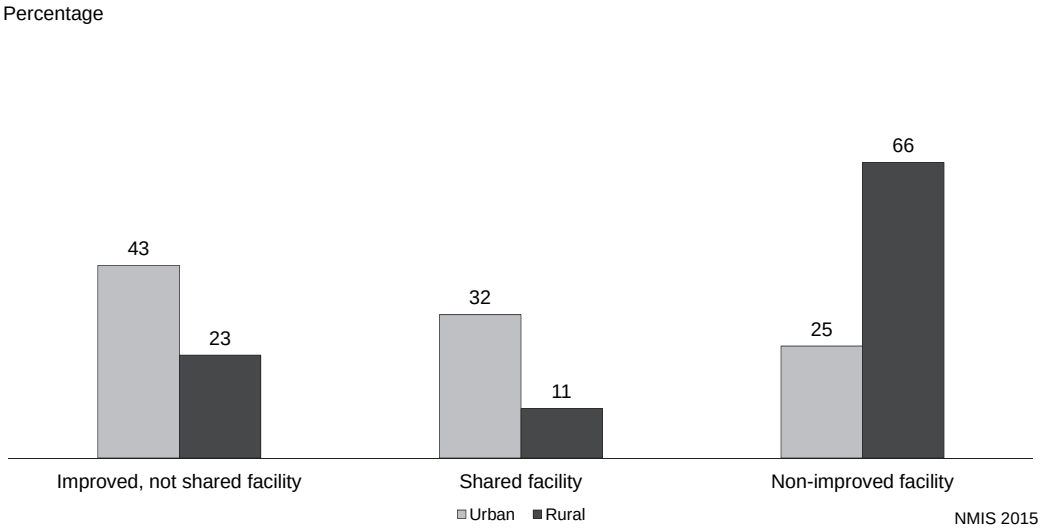
Table 2.4 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Nigeria 2015

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility	***42.6***	***23.2***	***30.9***	***48.0***	***24.4***	***33.2***
Flush/pour flush to piped sewer system	10.5	3.0	6.0	10.5	2.5	5.5
Flush/pour flush to septic tank	11.0	3.3	6.3	10.9	2.7	5.7
Flush/pour flush to pit latrine	4.8	1.8	3.0	6.3	1.6	3.3
Ventilated improved pit (VIP) latrine	5.0	3.9	4.3	5.7	4.6	5.0
Pit latrine with slab	11.0	10.4	10.6	14.0	12.4	13.0
Composting toilet	0.5	0.7	0.6	0.5	0.7	0.6
Shared facility[1]	***32.4***	***11.3***	***19.7***	***27.7***	***8.7***	***15.8***
Flush/pour flush to piped sewer system	4.7	1.2	2.6	3.7	0.9	1.9
Flush/pour flush to septic tank	7.1	1.3	3.7	6.4	1.1	3.1
Flush/pour flush to pit latrine	5.8	1.4	3.2	5.0	1.0	2.5
Ventilated improved pit (VIP) latrine	4.5	1.9	2.9	3.7	1.5	2.3
Pit latrine with slab	9.9	5.3	7.1	8.6	4.2	5.8
Composting toilet	0.3	0.2	0.2	0.3	0.1	0.2
Non-improved facility	***25.0***	***65.6***	***49.4***	***24.3***	***66.8***	***51.0***
Flush/pour flush not to sewer/septic tank/pit latrine	1.6	0.4	0.9	1.7	0.3	0.8
Pit latrine without slab/open pit	8.3	23.9	17.7	9.7	26.2	20.1
Bucket	0.6	1.0	0.8	0.6	0.9	0.8
Hanging toilet/hanging latrine	1.7	2.4	2.1	1.4	2.0	1.8
No facility/bush/field	12.5	37.8	27.8	10.6	37.3	27.4
Other	0.2	0.1	0.1	0.2	0.1	0.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Number	3,083	4,662	7,745	14,129	23,832	37,962

Note: National estimates do not include rural areas of Borno State.
[1] Facilities that would be considered improved if they were not shared by two or more households

Figure 2.2 **Percent distribution of households by type of toilet facility**



It is difficult to compare the sanitation data from the 2015 NMIS with the data from the 2010 NMIS for a few reasons. The 2010 NMIS did not ask respondents if their toilet facility was shared with other households. This question was asked in the 2015 NMIS. Also, response options such as "flush to somewhere else" and "flush, don't know where" were included in 2010 but not in 2015. However, the questions on household sanitation in the 2013 NDHS and the 2015 NMIS were asked in the same way, taking into account facilities shared among households. It should be noted that the sample size for the 2013 NDHS was much larger than the 2015 NMIS, thereby resulting in smaller confidence intervals for the data points. Thus, comparisons of sanitation facilities between the two surveys should take this fact into consideration.

The percentage of households with improved toilet facilities is similar in the 2013 NDHS and the 2015 NMIS (30 percent and 31 percent, respectively). In 2013, 25 percent of households shared facilities, and 45 percent used non-improved 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 (e.g., 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.

About half of Nigerian households (48 percent) do not have electricity. Eighty-two percent of households in urban areas have access to electricity, as compared with 33 percent of households in rural areas. Fifty-two percent of households live in dwellings with cement floors, while 32 percent of households have earth or sand floors. Differences by urban-rural residence are large. Almost 7 in 10 (67 percent) urban households have cement floors, compared with 4 in 10 (42 percent) rural households. Forty-seven percent of rural households have earth or sand floors, compared with only 11 percent of urban households. This information is important because the flooring material used in dwellings is not only an indicator of household wealth status, but also often an indicator of the quality of the environment in which the household lives.

The number of rooms a household uses for sleeping (regardless of whether or not the rooms are bedrooms) is an indicator of socioeconomic level; it can also be used to assess crowding, which can facilitate the spread of disease. The 2015 NMIS results show that 36 percent of households use one room for sleeping, 32 percent use two rooms, and 32 percent use three or more rooms. Urban households (41 percent) are more likely than rural households (33 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. Sixty-five percent of Nigerian households use wood for fuel, and 24 percent use kerosene. This represents a slight improvement from 2010, when 73 percent of households used wood and 22 percent used kerosene. Four in 10 urban households use wood for cooking (37 percent), as compared with 8 in 10 rural households (83 percent). Urban households are much more likely to use kerosene than rural households (44 percent versus 11 percent).

Table 2.5 Household characteristics

Percent distribution of households by housing characteristics and percentage using solid fuel for cooking, according to residence, Nigeria 2015

Housing characteristic	Residence		Total
	Urban	Rural	
Electricity			
Yes	81.5	32.8	52.2
No	18.5	67.2	47.8
Total	100.0	100.0	100.0
Flooring material			
Earth, sand	10.5	46.8	32.3
Dung	0.1	0.6	0.4
Wood/planks	0.2	1.0	0.7
Palm/bamboo	0.1	1.1	0.7
Parquet or polished wood	0.1	0.2	0.2
Vinyl or asphalt strips	0.2	0.1	0.1
Ceramic tiles	10.2	2.9	5.8
Cement	66.9	41.7	51.7
Carpet	11.7	5.5	8.0
Total	100.0	100.0	100.0
Rooms used for sleeping			
One	40.5	32.5	35.7
Two	31.0	33.0	32.2
Three or more	28.5	34.5	32.1
Total	100.0	100.0	100.0
Cooking fuel			
Electricity	1.2	0.3	0.6
LPG/cylinder/natural gas/biogas	9.6	1.5	4.7
Kerosene	43.9	10.5	23.8
Coal/lignite	0.2	0.0	0.1
Charcoal	6.3	1.2	3.3
Wood	37.3	83.3	65.0
Straw/shrubs/grass/sawdust	0.2	1.7	1.1
Agricultural crop	0.3	0.8	0.6
Animal dung/other fuel	0.0	0.0	0.0
No food cooked in household	0.8	0.5	0.6
Total	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	44.4	87.1	70.1
Number	3,083	4,662	7,745

Note: National estimates do not include rural areas of Borno State.
LPG = Liquid propane gas
[1] Includes coal/lignite, charcoal, wood/straw/shrubs/grass, agricultural crops, and animal dung

2.3.4 Household Possessions

The availability of durable goods is an 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. Seventy-nine percent of households have a mobile phone, 61 percent have a radio, and 47 percent have televisions. Overall, this is an improvement from 2010, when 60 percent of households owned a mobile phone, 69 percent owned a radio, and 40 percent owned a television. There is noticeable urban-rural variation in the proportion of households owning these durable goods. 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-four percent of households own a motorcycle or scooter (30 percent in urban areas and 36 percent in rural areas), and 18 percent own a bicycle (13 percent in urban areas and 22 percent in rural areas). Only 12 percent of households own a car or truck (21 percent in urban areas and 6 percent in rural areas), and 6 percent own an animal-drawn cart (2 percent in urban areas and 8 percent in rural areas).

Table 2.6 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land, and livestock/farm animals by residence, Nigeria 2015

Possession	Residence		Total
	Urban	Rural	
Household effects			
Radio	73.2	52.9	61.0
Television	74.8	28.4	46.9
Mobile telephone	90.2	70.8	78.5
Non-mobile telephone	3.1	1.4	2.1
Refrigerator	41.1	11.1	23.0
Cable TV	29.7	6.3	15.6
Generator	43.3	20.5	29.6
Air conditioner	7.5	0.8	3.5
Computer	13.4	2.5	6.8
Electric iron	59.9	18.4	34.9
Fan	73.2	26.1	44.8
Means of transport			
Bicycle	13.0	21.9	18.4
Animal-drawn cart	2.3	8.0	5.7
Motorcycle/scooter	30.4	35.6	33.5
Car/truck	20.5	6.4	12.0
Boat with a motor	0.6	2.3	1.7
Ownership of agricultural land	35.8	79.6	62.2
Ownership of farm animals[1]	30.5	58.8	47.6
Number	3,083	4,662	7,745

Note: National estimates do not include rural areas of Borno State.
[1] Includes cattle, cows, bulls, horses, donkeys, goats, sheep, or chickens

2.3.5 Wealth Index

The wealth index is a background characteristic 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 a standard deviation of one (Rutstein et al. 2004 and 2008). 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, zone, and state. 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 (29 percent and 46 percent, respectively) than rural areas (15 percent and 5 percent, respectively). On the other hand, rural areas have higher proportions of the population in the lowest and second quintiles (30 percent and 29 percent, respectively) than urban areas (3 percent and 5 percent, respectively) (see Figure 2.3).

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, 50 percent of the population in South West is concentrated in the highest wealth quintile, along with 32 percent in South East and 31 percent in South South. By contrast, only 7 percent of people in North West and 6 percent in North East are in the highest wealth quintile.

Table 2.7 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini coefficient, according to residence, zone, and state, Nigeria 2015

Residence/zone/state	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	3.4	5.4	16.2	29.2	45.9	100.0	14,129	0.19
Rural	29.9	28.7	22.2	14.6	4.6	100.0	23,832	0.35
Zone								
North Central	12.1	29.1	28.4	17.9	12.5	100.0	6,469	0.31
North East	26.9	27.9	23.9	15.3	6.0	100.0	5,088	0.30
North West	42.9	26.8	14.7	8.9	6.7	100.0	11,961	0.34
South East	2.3	7.9	21.4	36.0	32.4	100.0	3,668	0.16
South South	0.2	7.6	22.9	38.4	31.0	100.0	4,608	0.21
South West	3.5	7.3	15.2	24.5	49.5	100.0	6,168	0.16
State								
Sokoto	55.3	22.7	8.6	8.0	5.4	100.0	829	0.38
Zamfara	49.3	29.8	18.9	2.0	0.0	100.0	1,411	0.27
Katsina	44.1	33.1	4.2	11.5	7.1	100.0	2,654	0.40
Jigawa	56.6	23.5	15.2	3.6	1.2	100.0	1,819	0.33
Yobe	35.1	17.8	20.0	16.2	10.9	100.0	992	0.35
Borno (urban)	0.0	2.8	21.6	50.5	25.1	100.0	271	0.26
Adamawa	21.7	38.6	25.0	9.2	5.5	100.0	915	0.30
Gombe	17.2	29.3	26.5	23.5	3.4	100.0	757	0.28
Bauchi	42.1	23.3	21.6	10.7	2.3	100.0	1,464	0.31
Kano	38.7	19.9	16.9	6.8	17.7	100.0	2,405	0.46
Kaduna	19.9	29.8	29.4	15.0	6.0	100.0	1,619	0.29
Kebbi	43.2	27.2	11.8	15.7	2.1	100.0	1,224	0.43
Niger	26.6	27.7	23.6	9.1	13.0	100.0	1,407	0.38
FCT Abuja	1.6	12.6	15.3	25.0	45.5	100.0	193	0.31
Nasarawa	1.1	25.7	50.2	12.5	10.5	100.0	597	0.41
Plateau	21.3	43.2	21.8	9.0	4.7	100.0	1,192	0.38
Taraba	10.7	46.3	30.9	9.2	2.9	100.0	689	0.23
Benue	3.1	34.7	40.6	16.3	5.2	100.0	1,373	0.36
Kogi	0.0	7.9	32.2	42.6	17.2	100.0	821	0.34
Kwara	11.6	29.4	10.2	25.8	23.1	100.0	887	0.35
Oyo	11.5	16.2	10.7	16.8	44.8	100.0	1,712	0.26
Osun	0.0	3.6	24.9	43.0	28.5	100.0	1,069	0.25
Ekiti	0.0	2.1	17.7	48.5	31.6	100.0	510	0.29
Ondo	1.6	8.9	33.5	29.8	26.2	100.0	818	0.23
Edo	0.0	1.6	20.9	30.4	47.1	100.0	606	0.25
Anambra	0.0	0.8	15.1	32.9	51.2	100.0	915	0.17
Enugu	1.1	11.4	37.7	34.7	15.1	100.0	654	0.24
Ebonyi	10.0	24.6	29.1	18.6	17.6	100.0	762	0.27
Cross River	0.0	8.2	35.4	43.7	12.7	100.0	676	0.31
Akwa Ibom	0.3	17.8	27.4	34.9	19.7	100.0	797	0.29
Abia	0.0	4.0	13.9	41.6	40.4	100.0	532	0.20
Imo	0.0	0.0	12.8	53.1	34.0	100.0	805	0.25
Rivers	0.0	6.8	16.3	38.0	38.9	100.0	1,332	0.23
Bayelsa	0.0	5.2	21.1	43.6	30.1	100.0	558	0.25
Delta	0.9	3.6	20.9	41.0	33.6	100.0	639	0.16
Lagos	0.0	0.0	1.0	6.2	92.8	100.0	1,409	0.11
Ogun	0.6	7.6	17.0	28.9	45.9	100.0	649	0.28
Total	20.0	20.0	20.0	20.0	20.0	100.0	37,962	0.33

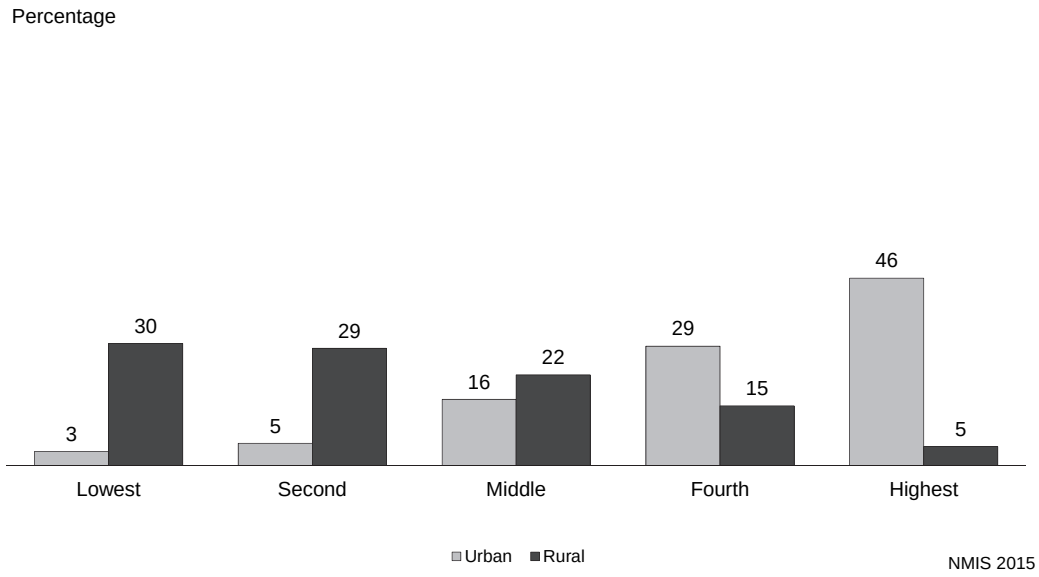
Note: Estimates for the North East Zone do not include rural areas of Borno State.

Among the states, 93 percent of the population in Lagos State is in the highest wealth quintile, followed by Anambra State with 51 percent and Edo State with 47 percent. In contrast, 57 percent of the population in Jigawa State is in the lowest wealth quintile, followed by Sokoto State with 55 percent and Zamfara State with 49 percent. Katsina State and Kebbi State have similar proportions of their populations in the lowest wealth quintile (44 percent and 43 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 (1 corresponds to a totally unequal distribution). The survey results show that wealth is relatively more evenly distributed in urban areas (0.19) than in rural areas (0.35). Among the zones,

wealth is most evenly distributed in South East and South West (0.16 each) and least evenly distributed in North West (0.34). By state, wealth is most evenly distributed in Lagos State (0.11), followed by Delta and Anambra States (0.17 and 0.16, respectively). States with a more unequal distribution of wealth include Kano, Kebbi, and Nassarawa (0.46, 0.43, and 0.41, respectively).

Figure 2.3 **Population wealth quintile distribution by sector**



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 3.1.1 presents the distribution of women age 15-49 by age group, residence, zone, education level, and wealth quintile. In general, the proportion of respondents in each age group increase as age increases, peaking at 20 percent for the 25-29 age group, and declining thereafter. This reflects the comparatively young age structure of the population. The percent distribution of women within each age group is similar to that observed in the 2010 NMIS.

Thirty-nine percent of female respondents live in urban areas, and 61 percent live in rural areas. The North West Zone has the highest percentage of female respondents (29 percent), followed by the North Central Zone and South West Zone (17 percent each).

Table 3.1.1 Background characteristics of respondents: National

Percent distribution of women age 15-49 by selected background characteristics, Nigeria 2015

Background characteristic	Women		
	Weighted percent	Weighted number	Unweighted number
Age			
15-19	17.1	1,376	1,405
20-24	19.1	1,533	1,512
25-29	20.4	1,636	1,620
30-34	16.5	1,325	1,329
35-39	12.1	971	986
40-44	9.1	729	715
45-49	5.8	464	467
Residence			
Urban	39.0	3,129	3,200
Rural	61.0	4,905	4,834
Zone			
North Central	16.9	1,357	1,472
North East	13.4	1,077	1,541
North West	29.4	2,359	1,814
South East	10.1	811	927
South South	13.4	1,080	1,172
South West	16.8	1,351	1,108
Education			
No education	38.8	3,119	2,982
Primary	15.5	1,244	1,273
Secondary	35.5	2,848	2,935
More than secondary	10.2	823	844
Wealth quintile			
Lowest	18.0	1,448	1,268
Second	19.0	1,530	1,464
Middle	19.5	1,564	1,667
Fourth	20.6	1,653	1,804
Highest	22.9	1,840	1,831
Total 15-49	100.0	8,034	8,034

Note: Estimates for the North East Zone do not include rural areas of Borno State.

Thirty-nine percent of women have no education, 16 percent have a primary school education, 36 percent have a secondary school education, and 10 percent have more than a secondary school education.

With respect to wealth, the proportion of women in each wealth quintile increases from 18 percent in the lowest quintile to 23 percent in the highest quintile.

Table 3.1.2 shows the percent distribution of women age 15-49 by state. The proportion of women residing within each state ranges from 1 percent in FCT-Abuja to 7 percent in Katsina.

Table 3.1.2 Distribution of respondents: States

Percent distribution of women age 15-49 by state, Nigeria 2015

	Women		
State	Weighted percent	Weighted number	Unweighted number
North Central			
FCT-Abuja	0.6	46	178
Benue	3.3	267	179
Kogi	2.3	188	220
Kwara	2.4	195	183
Nasarawa	1.6	131	262
Niger	3.6	285	205
Plateau	3.0	244	245
North East			
Adamawa	2.6	209	313
Bauchi	3.5	284	274
Borno (urban)	0.7	58	88
Gombe	1.9	155	287
Taraba	2.0	163	289
Yobe	2.6	207	290
North West			
Jigawa	4.6	371	281
Kaduna	3.8	305	244
Kano	6.1	491	252
Katsina	6.5	519	279
Kebbi	2.5	198	221
Sokoto	2.2	178	251
Zamfara	3.7	297	286
South East			
Abia	1.5	123	207
Anambra	2.2	177	116
Ebonyi	2.0	159	213
Enugu	2.0	162	214
Imo	2.4	189	177
South South			
Akwa Ibom	2.3	187	197
Bayelsa	1.6	126	234
Cross River	1.9	151	194
Delta	1.8	144	164
Edo	1.4	112	152
Rivers	4.5	361	231
South West			
Ekiti	1.2	99	157
Lagos	4.5	358	261
Ogun	1.9	151	188
Ondo	1.8	145	129
Osun	2.9	235	170
Oyo	4.5	362	203
Total 15-49	100.0	8,034	8,034

3.2 EDUCATIONAL ATTAINMENT OF WOMEN

Education is a key determinant of the lifestyle and status an individual enjoys in an enlightened 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 3.2.1 presents general educational characteristics for women and shows the relationship between the respondent's level of education and other background characteristics. Overall, survey respondents have a median of 6 years of education.

Generally, younger women have attained more years of education than older women. For example, 21 percent of women age 15-24 have completed secondary school, compared with 10 percent of women age 45-49. Likewise, 37 percent of women age 15-24 have never been to school, compared with 45 percent of women age 40-44 and 43 percent of women age 45-49.

Urban women are more than three times as likely as their rural counterparts to have attended school: 16 percent of urban women have never been to school, as compared with 54 percent of rural women. Urban women also stay in school longer, with 70 percent of urban women and 30 percent of rural women having at least some secondary education (i.e., they have attended secondary school, completed secondary school, or attended schooling above the secondary level).

The South East Zone (4 percent) has the lowest percentage of uneducated women, while the North West Zone (70 percent) has the highest. The South West Zone has the highest proportion of women who have attained more than secondary schooling (20 percent).

Table 3.2.1 also shows that women in lower wealth quintiles are less educated than women in higher wealth quintiles. Eighty-five percent of women in the lowest wealth quintile have no education, compared with 4 percent of women in the highest wealth quintile. Five percent of women in the lowest wealth quintile have attended secondary school or higher, compared with 88 percent of women in the highest wealth quintile.

Table 3.2.1 Educational attainment of interviewed women: National

Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics, Nigeria 2015

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	36.6	4.5	7.0	25.1	21.4	5.4	100.0	6.1	2,909
15-19	33.3	4.9	6.3	37.1	15.8	2.5	100.0	7.0	1,376
20-24	39.5	4.3	7.7	14.2	26.3	8.0	100.0	5.7	1,533
25-29	39.7	4.2	9.8	11.5	21.5	13.2	100.0	5.5	1,636
30-34	39.3	5.4	11.6	12.2	18.8	12.8	100.0	5.4	1,325
35-39	36.4	5.0	16.0	10.8	18.3	13.6	100.0	5.5	971
40-44	45.4	4.5	13.9	7.2	16.1	12.8	100.0	5.0	729
45-49	43.4	7.6	17.1	10.5	9.7	11.7	100.0	4.4	464
Residence									
Urban	15.8	3.6	10.5	20.8	30.3	19.0	100.0	10.8	3,129
Rural	53.5	5.6	10.8	12.9	12.5	4.7	100.0	0.0	4,905
Zone									
North Central	42.1	8.5	12.8	14.7	14.0	7.8	100.0	4.7	1,357
North East	58.2	4.9	10.7	12.0	10.5	3.7	100.0	0.0	1,077
North West	70.0	3.9	7.7	6.6	7.8	4.1	100.0	0.0	2,359
South East	4.3	4.0	11.6	24.5	37.5	18.1	100.0	11.1	811
South South	7.0	3.8	13.4	27.9	32.7	15.3	100.0	10.6	1,080
South West	11.9	4.3	10.7	22.2	31.1	19.9	100.0	11.0	1,351
Wealth quintile									
Lowest	85.3	4.2	5.7	3.5	1.2	0.2	100.0	0.0	1,448
Second	67.4	6.6	11.4	10.2	3.9	0.5	100.0	0.0	1,530
Middle	34.9	8.3	16.6	20.3	16.8	3.0	100.0	5.4	1,564
Fourth	14.0	4.0	13.2	23.8	32.4	12.6	100.0	9.9	1,653
Highest	4.2	1.7	6.6	20.0	37.4	30.2	100.0	11.4	1,840
Total	38.8	4.8	10.6	16.0	19.5	10.2	100.0	5.5	8,034

Note: Estimates for the North East Zone do not include rural areas of Borno State.
[1] Completed grade 6 at the primary level
[2] Completed 6 years at the secondary level

Table 3.2.2 presents women's educational attainment by state. There are striking differentials in educational attainment across the states. Women in 12 states—Bauchi, Borno (urban areas), Gombe, Jigawa, Kano, Katsina, Kebbi, Niger, Soktoto, Taraba, Yobe, and Zamfara—have a median of zero years of education. By contrast, women in Abia, Anambra, Enugu, Imo, Cross River, Edo, Rivers, Ekiti, Lagos, Ogun, and Osun have a median of 11 years of education. None of the women in Imo reported not having any education, while 98 percent of women in Zamfara reported having no education.

Table 3.2.2 Educational attainment of interviewed women: States

Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, by state, Nigeria 2015

State	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			
North Central									
FCT-Abuja	22.3	8.5	17.7	19.0	25.5	7.0	100.0	7.0	455
Benue	28.8	9.5	19.0	20.6	17.9	4.3	100.0	5.6	267
Kogi	13.0	7.1	16.0	16.8	36.3	10.8	100.0	10.4	188
Kwara	49.5	4.3	8.7	15.7	9.5	12.3	100.0	1.0	195
Nasarawa	29.5	12.5	15.6	21.1	12.3	8.9	100.0	5.5	131
Niger	75.2	2.0	4.0	3.4	8.6	6.8	100.0	0.0	285
Plateau	45.8	18.3	16.0	14.2	3.0	2.8	100.0	2.0	244
North East									
Adamawa	30.4	9.3	17.7	25.9	11.7	5.0	100.0	5.6	209
Bauchi	73.8	1.7	12.3	7.5	4.2	0.4	100.0	0.0	284
Borno (urban)	58.7	0.7	7.0	11.2	11.3	11.2	100.0	0.0	58
Gombe	57.1	4.4	9.4	5.0	16.7	7.3	100.0	0.0	155
Taraba	65.6	7.3	9.0	8.4	6.1	3.6	100.0	0.0	163
Yobe	59.5	4.2	4.9	12.4	16.8	2.2	100.0	0.0	207
North West									
Jigawa	86.0	1.0	6.7	2.4	3.8	0.1	100.0	0.0	371
Kaduna	36.9	5.5	12.7	20.8	17.0	7.2	100.0	5.6	305
Kano	58.6	2.7	11.1	8.5	12.0	7.1	100.0	0.0	491
Katsina	65.0	8.9	10.3	5.8	4.5	5.6	100.0	0.0	519
Kebbi	71.9	2.5	4.0	4.1	13.1	4.4	100.0	0.0	198
Sokoto	90.3	2.1	0.3	2.7	3.8	0.7	100.0	0.0	178
Zamfara	97.9	0.8	0.4	0.0	0.7	0.3	100.0	0.0	297
South East									
Abia	4.3	3.2	5.3	29.3	44.2	13.8	100.0	11.2	123
Anambra	3.2	2.0	9.2	22.9	39.4	23.3	100.0	11.3	177
Ebonyi	9.8	8.0	20.5	22.9	28.3	10.6	100.0	8.6	159
Enugu	5.1	4.7	17.2	21.3	35.6	16.0	100.0	11.0	162
Imo	0.0	2.3	5.9	27.2	40.6	24.0	100.0	11.4	189
South South									
Akwa Ibom	5.4	7.9	14.8	27.6	26.4	17.9	100.0	9.9	187
Bayelsa	11.6	6.5	13.3	32.8	27.2	8.7	100.0	8.3	126
Cross River	3.7	1.4	16.0	33.4	34.3	11.1	100.0	10.5	151
Delta	6.1	3.0	15.4	34.4	25.4	15.7	100.0	9.2	144
Edo	11.4	1.2	9.4	29.3	33.2	15.6	100.0	10.9	112
Rivers	6.6	2.7	12.1	21.1	39.8	17.7	100.0	11.2	361
South West									
Ekiti	1.3	4.6	7.7	22.1	32.9	31.4	100.0	11.4	99
Lagos	6.0	1.5	9.2	12.8	50.2	20.2	100.0	11.4	358
Ogun	13.0	3.7	15.7	18.6	30.2	18.8	100.0	10.7	151
Ondo	17.0	5.7	20.9	29.8	16.1	10.4	100.0	8.1	145
Osun	7.6	1.1	16.1	26.0	36.6	12.7	100.0	10.9	235
Oyo	21.1	8.6	3.2	27.3	14.5	25.2	100.0	5.7	362
Total	38.8	4.8	10.6	16.0	19.5	10.2	100.0	5.5	8,034

Note: Estimates for the North East Zone do not include rural areas of Borno State.
[1] Completed grade 6 at the primary level
[2] Completed 6 years at the secondary level

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 3.3.1 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, or English). The survey assumed that respondents who had attended any secondary school

are literate. As observedin Table 3.3.1, 49 percent of women age 15-49 are literate. The percentage of women considered literate includes those who attended higher than secondary school (10 percent), those who could read a whole sentence (23 percent), and those who could read part of a sentence (15 percent).

Table 3.3.1 Literacy of interviewed women: National

Percent distribution of women age 15-49 by level of schooling attended and level of literacy, and percentage literate, according to background characteristics, Nigeria 2015

Background characteristic	Higher than secondary school	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	No schooling or primary school: No card with required language	No schooling or primary school: Blind/visually impaired	Total	Percent-age literate[1]	Number of women
Age									
15-24	5.4	30.9	15.1	48.4	0.1	0.1	100.0	51.4	2,909
15-19	2.5	37.3	15.8	44.0	0.1	0.2	100.0	55.6	1,376
20-24	8.0	25.1	14.5	52.4	0.0	0.0	100.0	47.6	1,533
25-29	13.2	19.3	15.1	52.3	0.0	0.0	100.0	47.6	1,636
30-34	12.8	18.1	15.7	53.2	0.0	0.2	100.0	46.5	1,325
35-39	13.6	20.6	16.1	49.1	0.0	0.7	100.0	50.2	971
40-44	12.8	18.6	12.5	55.7	0.0	0.4	100.0	43.9	729
45-49	11.7	16.1	18.0	53.0	0.0	1.2	100.0	45.8	464
Residence									
Urban	19.0	34.3	19.4	26.9	0.0	0.3	100.0	72.7	3,129
Rural	4.7	16.1	12.6	66.4	0.0	0.2	100.0	33.3	4,905
Zone									
North Central	7.8	15.2	16.7	60.1	0.1	0.1	100.0	39.7	1,357
North East	3.7	15.6	13.5	67.0	0.0	0.1	100.0	32.8	1,077
North West	4.1	9.4	8.8	77.6	0.0	0.0	100.0	22.4	2,359
South East	18.1	42.5	20.1	18.7	0.0	0.6	100.0	80.7	811
South South	15.3	39.7	17.8	26.0	0.0	1.2	100.0	72.7	1,080
South West	19.9	36.6	21.4	22.1	0.0	0.0	100.0	77.9	1,351
Wealth quintile									
Lowest	0.2	2.3	5.2	92.2	0.0	0.0	100.0	7.8	1,448
Second	0.5	6.9	12.2	80.4	0.0	0.0	100.0	19.6	1,530
Middle	3.0	22.4	20.9	53.1	0.1	0.4	100.0	46.3	1,564
Fourth	12.6	36.1	21.0	29.7	0.0	0.6	100.0	69.7	1,653
Highest	30.2	42.3	15.7	11.5	0.0	0.3	100.0	88.2	1,840
Total	10.2	23.2	15.2	51.0	0.0	0.3	100.0	48.7	8,034

Note: Estimates for the North East Zone do not include rural areas of Borno State.
[1] Refers to women who attended more than secondary school and women who can read a whole sentence or part of a sentence

There are variations in literacy across background characteristics. For example, 44 percent of women age 40-44 are literate, compared with 56 percent of women age 15-19.

Urban-rural differentials are quite substantial, with 73 percent of urban women literate, compared with 33 percent of rural women. The South East Zone has the highest proportion of women who are literate (81 percent), while the North West Zone has the lowest (22 percent). In all of the northern zones, the proportion of women that is literate is lower than the national average of 49 percent. Literacy levels increase substantially with increasing wealth, from 8 percent among women in the lowest wealth quintile to 88 percent among women in the highest quintile.

Table 3.3.2 presents literacy rates among women by state. Literacy rates vary across the states from a low of 7 percent in Jigawa State to a high of 94 percent in Imo State.

Table 3.3.2 Literacy of interviewed women: States

Percent distribution of women age 15-49 by level of schooling attended and level of literacy, and percentage literate, by state, Nigeria 2015

State	Higher than secondary school	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	No schooling or primary school: No card with required language	No schooling or primary school: Blind/visually impaired	Total	Percentage literate[1]	Number of women
North Central									
FCT-Abuja	7.0	24.0	28.2	40.7	0.0	0.2	100.0	59.2	455
Benue	4.3	19.8	38.2	37.7	0.0	0.0	100.0	62.3	267
Kogi	10.8	30.1	13.9	44.9	0.0	0.4	100.0	54.7	188
Kwara	12.3	15.7	10.3	61.8	0.0	0.0	100.0	38.2	195
Nasarawa	8.9	8.4	20.0	61.8	0.9	0.0	100.0	37.4	131
Niger	6.8	6.6	5.6	81.0	0.0	0.0	100.0	19.0	285
Plateau	2.8	10.6	11.8	74.9	0.0	0.0	100.0	25.1	244
North East									
Adamawa	5.0	25.4	16.8	52.8	0.0	0.0	100.0	47.2	209
Bauchi	0.4	13.7	8.3	77.3	0.0	0.2	100.0	22.4	284
Borno (urban)	11.2	17.6	21.6	49.6	0.0	0.0	100.0	50.4	58
Gombe	7.3	16.0	13.6	62.6	0.0	0.6	100.0	36.9	155
Taraba	3.6	3.0	12.9	80.5	0.0	0.0	100.0	19.5	163
Yobe	2.2	17.6	15.3	64.8	0.0	0.0	100.0	35.2	207
North West									
Jigawa	0.1	2.2	4.6	93.1	0.0	0.0	100.0	6.9	371
Kaduna	7.2	16.0	19.8	57.0	0.0	0.0	100.0	43.0	305
Kano	7.1	22.7	7.5	62.7	0.0	0.0	100.0	37.3	491
Katsina	5.6	3.1	11.4	80.0	0.0	0.0	100.0	20.0	519
Kebbi	4.4	15.1	2.2	78.3	0.0	0.0	100.0	21.7	198
Sokoto	0.7	3.7	4.3	91.3	0.0	0.0	100.0	8.7	178
Zamfara	0.3	0.7	7.5	91.2	0.4	0.0	100.0	8.4	297
South East									
Abia	13.8	69.1	6.3	10.8	0.0	0.0	100.0	89.2	123
Anambra	23.3	38.1	21.7	16.3	0.0	0.7	100.0	83.0	177
Ebonyi	10.6	25.9	25.9	37.6	0.0	0.0	100.0	62.4	159
Enugu	16.0	28.3	30.0	24.8	0.0	0.8	100.0	74.4	162
Imo	24.0	55.6	14.0	5.0	0.0	1.4	100.0	93.6	189
South South									
Akwa Ibom	17.9	37.7	19.1	25.4	0.0	0.0	100.0	74.6	187
Bayelsa	8.7	43.0	20.7	27.6	0.0	0.0	100.0	72.4	126
Cross River	11.1	46.6	17.0	25.2	0.0	0.0	100.0	74.8	151
Delta	15.7	35.2	18.7	29.9	0.0	0.5	100.0	69.6	144
Edo	15.6	36.2	16.0	32.3	0.0	0.0	100.0	67.7	112
Rivers	17.7	39.5	16.6	22.6	0.0	3.5	100.0	73.8	361
South West									
Ekiti	31.4	31.8	20.7	16.1	0.0	0.0	100.0	83.9	99
Lagos	20.2	38.0	25.3	16.4	0.0	0.0	100.0	83.6	358
Ogun	18.8	46.5	9.9	24.8	0.0	0.0	100.0	75.2	151
Ondo	10.4	20.8	31.7	37.0	0.0	0.0	100.0	63.0	145
Osun	12.7	39.0	28.8	19.5	0.0	0.0	100.0	80.5	235
Oyo	25.2	37.0	13.6	24.2	0.0	0.0	100.0	75.8	362
Total	10.2	23.2	15.2	51.0	0.0	0.3	100.0	48.7	8,034

Note: Estimates for the North East Zone do not include rural areas of Borno State.

[1] Refers to women who attended more than secondary school and women who can read a whole sentence or part of a sentence

KNOWLEDGE OF MALARIA AND FEVER MANAGEMENT 4

4.1 WOMEN'S KNOWLEDGE OF MALARIA

4.1.1 Knowledge of Malaria Symptoms

Knowledge about malaria symptoms affects health-seeking behaviour. To assess basic knowledge about malaria, all women who were interviewed in the 2015 NMIS were asked if they had ever heard of an illness called malaria. If they responded affirmatively, they were then asked whether they could name any symptoms of malaria (specifically, they were asked "How can you tell if you have malaria?"). National- and state-level data on knowledge of malaria are shown in Tables 4.1.1 and 4.1.2, respectively (percentages may sum to more than 100 because respondents could offer more than one response).

Nationally, knowledge of malaria is high, with 87 percent of women having heard of the illness. This represents a decrease, however, from the figure of 94 percent reported in the 2010 NMIS. Urban women are more likely than rural women to have heard of malaria (91 percent and 85 percent, respectively).

Knowledge of malaria varies by zone. Almost all of the women in the South East Zone have heard of malaria (98 percent), followed by 94 percent of women in South South Zone. North Central and North West have the lowest percentages of women who have heard of malaria (83 percent each). Knowledge about malaria increases with increasing education and wealth.

Lack of knowledge about the symptoms of malaria affects timely requests for appropriate preventive measures. When women who had heard of malaria are asked about symptoms of the illness, the most common responses are fever (69) and headache (52 percent). Thirty-five percent of women say that chills and shivering are symptoms of malaria, and 31 percent state that joint pain is a symptom. Nineteen percent of women report poor appetite as a symptom, and 14 percent report vomiting. Two percent of women report that convulsions are a symptom of malaria. Three percent of women do not know any symptoms of malaria.

Table 4.1.1 Knowledge of malaria symptoms: National

Percentage of all women age 15-49 who have ever heard of malaria, and among them, the percentage who know various symptoms of malaria, by background characteristics, Nigeria 2015

Background characteristic	All women age 15-49		Among women who have ever heard of malaria, percentage who cite specific symptoms:											
	Percentage who have ever heard of malaria	Number of women	Fever	Chills/ shivering	Headache	Joint pain	Poor appetite	Vomiting	Convulsion	Cough	Catarrh/ Nasal congestion	Other	Don't know any	Number of women
Age														
15-19	84.3	1,376	68.6	31.1	49.0	26.5	13.7	12.3	1.0	4.2	2.9	5.3	5.1	1,160
20-24	87.4	1,533	69.0	32.5	48.3	28.1	16.8	12.2	1.6	4.5	2.8	7.1	3.5	1,340
25-29	86.7	1,636	68.3	35.7	51.6	29.9	20.6	15.8	2.4	5.6	3.9	6.6	3.1	1,419
30-34	87.4	1,325	71.2	37.9	55.9	32.3	20.9	15.9	2.5	5.5	4.0	8.7	2.3	1,159
35-39	89.5	971	69.1	33.0	56.3	35.5	21.1	14.8	2.4	6.7	3.3	7.8	2.3	869
40-44	89.3	729	72.5	36.2	54.1	37.3	21.1	12.4	3.8	6.0	5.1	8.9	1.1	651
45-49	89.8	464	66.7	38.5	54.1	40.3	23.0	13.9	1.5	6.0	3.8	7.9	1.6	416
Residence														
Urban	90.9	3,129	68.5	38.8	59.3	35.1	24.4	16.6	3.1	6.6	4.0	8.2	1.8	2,846
Rural	85.0	4,905	70.0	31.6	47.4	28.9	15.4	12.2	1.4	4.5	3.3	6.7	3.8	4,169
Zone														
North Central	82.5	1,357	67.0	38.5	51.0	33.4	17.6	9.4	1.5	4.1	1.7	4.0	4.6	1,120
North East	86.7	1,077	69.4	41.7	58.1	31.6	13.6	18.0	4.0	2.1	0.1	2.4	4.0	934
North West	83.2	2,359	80.8	24.3	38.9	27.1	9.4	14.8	0.8	1.8	0.8	3.5	2.7	1,962
South East	97.8	811	71.7	38.1	55.9	25.5	21.2	10.3	1.2	7.3	6.1	13.6	1.0	793
South South	93.7	1,080	56.9	28.4	47.7	26.1	26.6	7.4	0.7	11.0	11.6	17.3	3.4	1,012
South West	88.4	1,351	61.9	44.9	72.0	44.9	32.6	21.8	5.1	8.7	4.1	7.5	2.2	1,194
Education														
No education	79.4	3,119	75.0	28.5	42.3	27.3	11.7	13.9	1.6	2.9	1.2	3.8	3.7	2,477
Primary	88.7	1,244	65.8	37.1	51.7	33.3	18.1	11.6	2.2	5.2	3.4	9.1	3.4	1,104
Secondary	92.7	2,848	65.0	36.6	57.9	32.4	22.8	13.7	1.8	6.4	4.5	8.9	2.9	2,640
More than secondary	96.5	823	71.4	43.2	64.8	38.1	30.9	18.4	4.8	9.7	8.5	10.1	0.6	794
Wealth quintile														
Lowest	79.5	1,448	74.9	27.9	41.6	27.7	9.9	16.6	1.0	1.5	0.5	2.9	4.1	1,150
Second	81.1	1,530	74.2	33.3	43.9	26.6	11.3	11.4	1.6	3.4	2.2	4.2	3.6	1,241
Middle	86.6	1,564	68.4	33.4	47.9	30.4	16.1	12.7	1.9	5.7	2.6	8.6	3.4	1,354
Fourth	93.0	1,653	67.6	36.9	56.6	33.4	23.4	12.0	2.2	5.7	5.0	10.3	3.1	1,536
Highest	94.2	1,840	64.6	38.6	64.7	36.3	29.1	16.8	3.4	8.6	6.1	8.6	1.4	1,733
Total	87.3	8,034	69.4	34.5	52.2	31.4	19.0	14.0	2.1	5.3	3.6	7.3	3.0	7,015

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.1.2 presents data on knowledge of malaria symptoms by state. The states in the South East Zone have the highest percentages of women who have ever heard of malaria, ranging from 94 percent in Ebonyi to 100 percent in Enugu. In the South West Zone, Osun has the highest percentage (98 percent) and Ondo the lowest (82 percent). In the South South Zone, Rivers and Bayelsa have the highest percentages of women who have heard of malaria (99 percent each), while Edo has the lowest (77 percent). In the North Central Zone, Kogi and Plateau have the highest percentages (95 percent each), and Kwara has the lowest percentage (68 percent). Among states in the North East Zone, Bauchi and Yobe have the highest percentages of women who have heard of malaria (94 percent each), while Adamawa has the lowest percentage (72 percent). Finally, in North West Zone, Kano has the highest percentage (99 percent) and Jigawa the lowest (65 percent).

As observed in Table 4.1.2, the percentages of women reporting various symptoms varies widely by state. Nasarawa has the highest percentage of women who do not know any symptoms (14 percent).

Table 4.1.2 Knowledge of malaria symptoms: States

Percentage of all women age 15-49 who have ever heard of malaria, and among them, percentage who know various symptoms of malaria, by state, Nigeria 2015

State	All women age 15-49		Among women who have ever heard of malaria, percentage who cite specific symptoms:											
	Percentage who have ever heard of malaria	Number of women	Fever	Chills/ shivering	Head-ache	Joint pain	Poor appetite	Vomiting	Con-vulsion	Cough	Catarrh/ Nasal con-gestion	Other	Don't know any	Number of women
North Central														
FCT-Abuja	82.3	46	60.5	27.5	44.5	7.6	6.3	8.8	0.7	9.5	1.5	3.4	7.9	38
Benue	82.2	267	62.3	27.3	43.0	42.8	20.3	10.6	1.6	3.7	1.8	1.3	3.6	219
Kogi	94.8	188	73.3	38.3	71.9	49.4	36.0	13.7	1.3	6.5	2.0	4.1	2.8	178
Kwara	67.6	195	29.8	52.2	69.2	39.8	9.1	8.1	6.4	6.5	2.3	2.5	4.7	132
Nasarawa	81.2	131	59.5	37.7	49.1	35.7	9.0	10.9	1.9	4.7	2.2	12.3	14.2	107
Niger	75.3	285	71.5	25.5	35.8	14.2	3.7	5.4	0.0	4.0	1.7	2.7	6.5	215
Plateau	94.6	244	88.2	55.7	48.2	29.2	24.5	8.8	0.0	0.3	1.0	4.7	0.0	231
North East														
Adamawa	72.4	209	49.2	48.0	64.6	22.5	17.2	23.5	5.3	0.3	0.0	1.6	5.2	151
Bauchi	94.1	284	56.7	34.0	52.0	22.8	4.0	21.3	1.8	2.0	0.0	1.1	9.9	268
Borno (urban)	68.2	58	99.0	59.8	65.5	36.5	26.4	26.4	20.5	18.4	0.0	0.0	0.0	39
Gombe	91.6	155	94.2	61.6	51.0	35.4	7.7	7.7	1.9	0.0	0.3	6.5	0.0	142
Taraba	85.1	163	67.9	66.0	58.8	28.8	21.2	13.2	4.7	2.7	0.3	2.9	2.1	139
Yobe	93.9	207	79.5	12.0	64.5	49.0	20.0	18.6	3.9	1.5	0.0	2.1	0.0	194
North West														
Jigawa	65.2	371	77.0	7.6	37.5	12.1	11.3	16.5	3.3	3.6	0.4	9.9	4.9	242
Kaduna	71.2	305	69.1	21.8	40.7	32.1	6.1	7.7	0.0	0.0	0.0	6.8	8.7	218
Kano	98.8	491	94.4	28.9	43.9	12.6	7.4	22.4	0.4	0.4	0.4	4.5	0.8	485
Katsina	93.1	519	77.7	26.1	30.6	47.2	10.7	7.4	0.3	1.4	1.1	0.8	2.3	483
Kebbi	87.2	198	79.8	23.3	48.0	34.3	4.3	3.2	0.0	0.5	0.0	0.0	0.2	173
Sokoto	93.1	178	75.7	17.6	25.3	17.6	7.8	16.9	0.0	6.0	1.5	0.7	1.0	165
Zamfara	66.2	297	77.6	38.4	50.4	28.4	18.6	28.1	2.3	3.3	3.0	1.6	2.7	197
South East														
Abia	96.8	123	60.4	24.5	56.5	23.8	19.7	6.4	0.5	10.4	1.4	5.5	1.4	119
Anambra	99.2	177	63.6	45.1	49.8	17.7	36.1	11.2	1.5	3.0	14.1	23.7	1.8	176
Ebonyi	94.2	159	64.4	44.0	43.7	44.8	13.4	12.7	1.7	5.7	4.5	27.2	1.5	150
Enugu	99.5	162	90.8	50.5	62.0	14.0	11.8	9.4	0.0	8.4	0.9	0.9	0.0	161
Imo	98.8	189	76.0	24.7	66.0	28.2	22.5	11.0	2.0	9.8	7.5	9.1	0.5	187
South South														
Akwa Ibom	94.7	187	62.1	21.0	65.7	36.5	17.1	2.9	0.0	21.9	25.2	24.5	2.0	177
Bayelsa	98.5	126	46.6	46.3	42.5	31.2	50.8	14.7	3.8	8.2	13.7	18.1	0.9	124
Cross River	94.5	151	57.7	23.9	43.7	14.7	11.4	4.2	1.9	16.8	10.9	28.9	1.4	142
Delta	88.2	144	53.8	24.3	43.2	12.0	11.2	9.9	0.0	6.9	3.5	14.0	7.4	127
Edo	77.1	112	54.0	38.9	33.3	26.7	16.2	12.0	0.0	3.5	3.2	5.9	8.3	86
Rivers	98.6	361	59.3	26.5	47.2	28.6	37.1	6.3	0.0	7.6	9.1	12.9	3.2	356
South West														
Ekiti	88.0	99	57.0	58.2	79.1	51.3	47.2	15.8	9.4	9.6	2.3	11.3	0.7	87
Lagos	82.7	358	36.1	25.3	67.9	42.9	26.3	5.6	0.5	4.3	0.5	10.6	1.5	296
Ogun	91.2	151	62.3	59.6	79.2	44.6	25.2	14.3	0.0	2.3	4.0	8.8	0.7	138
Ondo	81.5	145	45.5	40.0	54.1	36.0	11.6	12.5	1.1	6.0	2.0	2.8	5.7	118
Osun	97.9	235	67.5	21.2	47.3	22.9	19.6	12.5	0.6	3.1	2.4	14.3	5.1	230
Oyo	89.5	362	88.8	71.7	94.9	64.0	54.4	51.5	15.2	20.2	10.0	0.0	0.7	324
Total	87.3	8,034	69.4	34.5	52.2	31.4	19.0	14.0	2.1	5.3	3.6	7.3	3.0	7,015

Notes: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

4.1.2 Knowledge of Causes of Malaria

Lack of knowledge about how malaria is spread interferes with the ability to take appropriate preventive measures. Women were asked several questions to ascertain their knowledge of the causes of malaria. Table 4.2.1 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 malaria. Multiple responses were recorded from respondents, and they were asked to mention as many causes as possible.

Overall, 88 percent of women report that malaria is caused by mosquitoes, 29 percent say malaria is caused by dirty surroundings, and 20 percent say malaria is caused by the presence of stagnant water. Six percent of women say that eating certain foods causes malaria, and 1 percent of women mention that drinking beer can cause one to fall ill with malaria. The percentage of women who report that malaria is caused by mosquitoes varies from 84 percent among those with a primary education to 94 percent among those with more than a secondary education. Less variation is observed by household wealth. Figure 4.1 shows trends in causes of malaria reported in the 2010 and 2015 NMIS surveys.

When asked which groups of people are most likely to get malaria, 49 percent of women report that children are most likely to be affected, 42 percent say that everyone is vulnerable, 21 percent report that pregnant women are most likely to be affected, 7 percent say that adults are most vulnerable, and 6 percent report that the elderly are most vulnerable. Eight percent of women do not know who is most likely to be affected by malaria.

Table 4.2.1 Knowledge of causes of malaria and people most at risk to get malaria: National

Among women age 15-49 who have ever heard of malaria, the percentage who cite specific causes of malaria and the people most at risk to get malaria, by background characteristics, Nigeria 2015

	Perceived causes of malaria							People most likely to be affected by malaria						
Background characteristic	Mos-quitoes	Stag-nant water	Dirty sur-roundings	Beer	Certain foods	Other	Don't know	Children	Preg-nant women	Adults	Elderly	Every-one	Don't know	Number of women
Age														
15-19	87.1	15.2	25.8	1.2	4.4	1.8	6.1	45.7	16.5	6.8	4.5	40.1	11.8	1,160
20-24	87.7	17.4	25.6	0.9	3.7	2.3	5.5	48.0	20.2	6.7	4.9	42.4	7.9	1,340
25-29	88.0	20.2	28.4	1.5	5.7	2.3	5.4	50.6	21.4	8.1	5.8	41.3	8.5	1,419
30-34	87.8	22.5	31.9	1.5	6.7	2.6	4.1	51.3	23.5	6.7	6.9	40.6	7.3	1,159
35-39	87.3	21.2	29.7	0.8	6.5	3.1	4.5	48.7	21.4	8.2	7.7	42.7	7.0	869
40-44	89.2	22.6	31.4	1.7	7.3	2.0	3.5	50.3	19.8	6.4	6.1	45.9	5.5	651
45-49	87.3	19.9	31.1	1.3	7.1	5.7	4.3	42.9	19.9	7.6	5.8	45.0	7.4	416
Residence														
Urban	89.2	24.4	37.1	2.3	7.8	3.0	3.3	45.0	22.8	8.8	7.4	47.5	6.5	2,846
Rural	86.8	16.2	22.8	0.5	4.1	2.2	6.1	51.3	18.9	6.1	4.9	38.3	9.3	4,169
Zone														
North Central	86.4	15.3	20.1	0.4	3.3	1.6	6.7	54.6	24.2	4.5	5.5	33.3	9.7	1,120
North East	88.3	27.3	28.7	3.0	1.9	0.9	4.8	66.0	36.5	11.9	5.3	20.6	10.5	934
North West	89.7	13.9	17.7	0.1	0.9	0.3	4.9	54.5	14.7	3.1	3.7	40.8	4.0	1,962
South East	88.8	15.4	30.1	2.0	16.2	4.5	4.1	31.0	16.6	7.5	7.3	56.0	9.2	793
South South	85.7	17.9	34.6	0.2	9.1	5.1	5.4	38.7	16.2	7.8	4.5	40.6	15.6	1,012
South West	86.4	30.8	48.3	2.9	8.2	4.9	3.7	40.3	20.2	12.1	10.5	60.8	4.9	1,194
Education														
No education	86.1	14.5	18.5	0.7	2.3	1.2	7.2	53.4	18.6	5.4	4.1	37.7	8.2	2,477
Primary	84.4	17.6	27.5	1.1	7.7	5.3	6.2	50.8	21.5	7.2	6.3	37.8	9.2	1,104
Secondary	88.9	22.1	34.8	1.7	6.9	2.9	3.8	43.8	20.9	8.3	6.9	45.9	8.6	2,640
More than secondary	93.7	29.5	41.1	1.9	8.5	1.7	0.2	47.3	23.5	9.2	7.3	48.3	5.4	794
Wealth quintile														
Lowest	87.0	12.5	15.9	0.2	1.0	0.7	6.7	57.2	16.2	4.3	4.5	34.6	7.5	1,150
Second	85.9	12.6	16.6	0.9	3.2	2.2	7.8	54.8	18.5	5.5	4.6	37.2	8.8	1,241
Middle	85.6	18.9	26.4	1.3	5.4	3.3	6.1	46.5	22.3	6.5	5.0	41.8	9.2	1,354
Fourth	88.9	22.7	33.6	1.2	8.0	3.5	3.7	43.6	22.8	8.1	6.6	44.1	9.3	1,536
Highest	90.3	26.9	43.0	2.2	8.3	2.6	2.0	44.9	21.4	10.1	7.7	48.8	6.5	1,733
Total	87.8	19.5	28.6	1.3	5.6	2.6	5.0	48.7	20.5	7.2	5.9	42.0	8.2	7,015

Notes: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.2.2 presents state data on knowledge of causes of malaria and which groups of people women believe are most at risk of getting malaria. Among the states, the percentage of women who say that mosquitoes cause malaria ranges from a low of 67 percent in Ondo State to a high of 99 percent in Oyo State and Borno State (urban areas).

There is wide variation across the states with respect to which groups of people women believe are most likely to be affected by malaria.

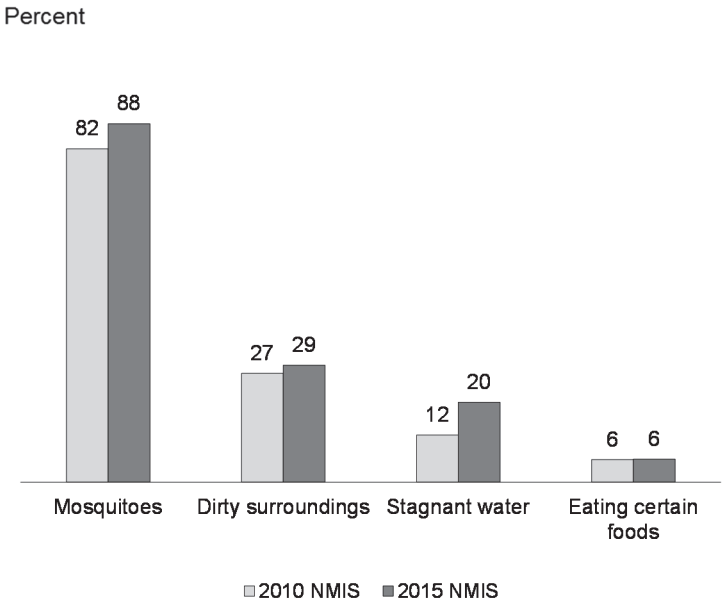
Table 4.2.2 Knowledge of causes of malaria and people most at risk to get malaria: States

Among women age 15-49 who have ever heard of malaria, the percentage who cite specific causes of malaria and the people most at risk to get malaria, by state, Nigeria 2015

	Perceived causes of malaria							People most likely to be affected by malaria						
State	Mos-quitoes	Stag-nant water	Dirty sur-roundings	Beer	Certain foods	Other	Don't know	Children	Pregnant women	Adults	Elderly	Everyone	Don't know	Number of women
North Central														
FCT-Abuja	88.7	9.6	19.4	0.0	0.7	0.0	3.5	23.9	8.2	1.4	0.6	49.7	20.1	38
Benue	94.7	17.7	12.6	1.2	3.2	0.0	3.2	53.3	26.2	7.0	6.7	34.2	9.3	219
Kogi	91.6	25.6	43.6	1.2	6.4	2.7	1.2	51.6	27.9	9.1	15.4	37.1	3.6	178
Kwara	71.1	28.7	35.8	0.0	7.7	4.9	12.8	34.8	6.6	7.4	4.9	56.8	9.8	132
Nasarawa	77.4	12.3	13.8	0.0	1.1	2.4	11.0	68.2	13.2	2.0	1.6	16.3	11.1	107
Niger	74.7	4.8	17.0	0.0	1.3	0.0	14.9	31.0	7.9	1.3	0.5	46.4	20.7	215
Plateau	98.0	9.3	6.2	0.0	1.9	1.8	1.5	89.9	52.2	1.4	4.3	9.2	2.3	231
North East														
Adamawa	86.1	5.1	14.7	0.0	1.4	1.1	8.6	59.6	15.3	5.5	13.4	15.8	23.7	151
Bauchi	86.3	19.1	21.6	0.0	0.9	0.0	6.5	60.7	35.8	12.8	1.3	14.4	19.0	268
Borno (urban)	99.0	55.7	45.8	31.5	13.3	0.0	1.0	95.1	75.6	27.3	14.3	27.4	0.0	39
Gombe	93.3	59.1	60.4	0.0	0.7	1.8	1.2	75.6	60.8	26.4	4.4	20.0	1.4	142
Taraba	84.0	33.0	33.4	10.5	3.1	1.6	9.0	69.6	40.2	11.1	9.2	25.0	6.1	139
Yobe	90.1	22.7	19.5	0.3	1.1	1.0	0.0	62.7	25.8	2.6	0.5	29.0	0.3	194
North West														
Jigawa	85.6	20.8	27.7	0.2	0.9	0.0	6.4	32.2	12.9	0.2	5.2	59.7	9.0	242
Kaduna	81.7	23.2	29.0	0.6	0.0	0.5	10.1	70.4	27.0	3.4	2.8	15.1	9.7	218
Kano	93.2	7.5	11.6	0.0	0.0	0.4	3.5	43.8	9.2	3.1	0.0	55.1	0.4	485
Katsina	91.3	9.9	9.6	0.0	1.6	0.4	5.6	71.4	12.5	1.8	3.1	21.1	2.4	483
Kebbi	89.8	24.0	27.2	0.2	1.3	0.0	1.4	79.0	23.1	12.1	18.4	32.5	0.7	173
Sokoto	94.0	9.9	13.3	0.0	1.6	0.4	0.9	53.9	17.4	3.3	0.9	47.7	0.5	165
Zamfara	87.3	15.6	23.1	0.0	2.0	0.0	5.6	28.6	12.7	1.5	2.5	60.9	10.6	197
South East														
Abia	89.6	16.5	42.7	0.0	7.2	3.2	3.4	19.8	8.0	2.8	5.5	72.7	7.8	119
Anambra	88.7	18.1	28.4	4.0	21.2	3.0	6.3	35.9	29.6	8.7	12.0	43.5	16.4	176
Ebonyi	80.3	15.8	31.6	5.7	27.4	12.8	6.0	52.5	27.8	14.8	13.6	36.0	13.4	150
Enugu	89.3	11.9	30.5	0.5	9.8	3.3	3.8	21.0	7.2	3.2	4.2	75.1	1.9	161
Imo	94.6	15.0	22.2	0.0	13.8	1.2	1.2	24.9	9.2	7.0	1.6	56.6	6.3	187
South South														
Akwa Ibom	78.3	7.4	25.3	0.0	21.2	7.9	7.2	22.6	10.1	4.4	2.5	59.9	12.2	177
Bayelsa	86.3	36.9	55.9	1.2	3.1	10.5	3.6	54.3	41.5	19.1	18.9	39.1	3.4	124
Cross River	83.5	11.0	25.9	0.7	3.7	6.2	4.9	33.8	24.0	6.6	3.2	35.2	23.8	142
Delta	83.2	23.6	41.6	0.0	1.4	2.6	8.1	55.2	4.4	4.4	2.5	31.0	10.1	127
Edo	89.3	21.2	40.4	0.0	4.4	6.4	6.6	26.4	12.2	3.3	2.8	65.1	7.2	86
Rivers	90.2	16.5	31.4	0.0	11.2	2.0	4.2	40.5	12.4	8.4	2.2	31.2	22.4	356
South West														
Ekiti	84.3	24.0	18.2	0.0	10.9	8.4	4.9	16.6	8.5	4.5	9.1	86.0	5.4	87
Lagos	80.3	29.9	51.7	8.6	6.3	3.4	2.7	35.9	25.3	15.9	12.6	52.6	4.7	296
Ogun	87.8	15.3	38.4	0.0	9.5	12.4	1.4	25.6	11.2	10.0	6.9	70.5	2.5	138
Ondo	66.9	18.5	30.6	0.8	9.3	2.9	14.7	14.2	12.3	7.6	6.0	67.9	16.9	118
Osun	86.6	15.7	27.5	0.0	12.1	9.2	4.3	26.1	2.4	2.9	1.2	64.1	6.3	230
Oyo	98.8	55.3	78.8	2.7	5.6	0.0	0.7	76.6	38.0	19.8	18.7	52.4	0.7	324
Total	87.8	19.5	28.6	1.3	5.6	2.6	5.0	48.7	20.5	7.2	5.9	42.0	8.2	7,015

Notes: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Figure 4.1 **Trends in knowledge of causes of malaria**



4.1.3 Knowledge of Ways to Avoid Malaria

Women were asked during the survey if they know of ways to avoid getting malaria. Those who knew ways to avoid getting malaria were asked to name them. Table 4.3.1 shows responses provided by women age 15 to 49. Overall, 93 percent of women say there are ways to avoid getting malaria. Fifty-six percent cite sleeping inside any mosquito net, 33 percent cite sleeping inside an insecticide-treated net (ITN) or a long-lasting insecticidal net (LLIN), 32 percent cite keep surrounding clean, and 22 percent cite using insecticide spray. Women also mention using mosquito coils (17 percent), eliminating stagnant water (12 percent), keeping windows and doors closed (10 percent), using insect repellent (4 percent), and cutting the grass (8 percent).

The percentage of women who mention specific ways to avoid malaria varies among the zones and among wealth quintiles. In the North West Zone, more women mention mosquito coils (22 percent) than ITNs/LLINs (8 percent). In the North Central Zone, more women mention insecticide spray (32 percent) than ITNs/LLINs (27 percent). In the South West Zone, keeping the environment clean and using ITNs/LLINs were mentioned by similar proportions of women (47 percent and 49 percent, respectively). Similarly, 49 percent of women in the South East Zone mention keeping the environment clean, while 42 percent mention the use of ITNs/LLINs. In general, the percentage of women who mention sleeping inside an ITN or an LLIN as a way to avoid getting malaria increases with increasing household wealth: increasing from 17 percent of women in the lowest wealth quintile to 43 percent and 41 percent in the fourth and highest wealth quintiles.

Table 4.3.1 Knowledge of ways to avoid malaria: National

Among women age 15-49 who have ever heard of malaria, 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, by background characteristics, Nigeria 2015

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 getting malaria: Sleep inside mosquito net	Sleep inside 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	Other	Don't know	Number of women
Age														
15-19	94.7	1,160	58.5	31.2	17.9	16.5	8.0	3.3	29.6	4.5	9.4	4.4	2.4	1,099
20-24	92.8	1,340	59.6	29.2	21.0	16.7	7.5	2.8	27.7	5.7	10.9	4.3	3.3	1,244
25-29	92.3	1,419	55.1	33.6	24.5	16.5	9.7	3.6	32.2	8.5	12.0	4.7	1.1	1,309
30-34	91.2	1,159	58.0	32.6	23.8	19.4	12.7	3.3	34.3	9.8	12.3	4.7	2.0	1,056
35-39	92.6	869	51.4	37.8	24.0	16.3	10.7	4.0	36.4	9.1	13.7	5.0	3.5	805
40-44	93.9	651	55.1	33.8	24.2	17.4	12.1	4.2	30.3	9.2	14.9	4.4	2.5	612
45-49	91.0	416	43.8	38.6	22.6	16.2	12.6	4.0	42.2	11.4	16.2	5.5	2.3	379
Residence														
Urban	94.8	2,846	50.5	38.0	31.3	19.0	12.6	4.4	40.9	10.1	17.7	5.0	1.8	2,697
Rural	91.3	4,169	59.7	29.5	16.1	15.7	8.2	2.8	26.0	6.2	8.2	4.4	2.8	3,806
Zone														
North Central	85.8	1,120	64.7	27.3	31.5	13.7	12.7	3.3	25.3	6.8	10.2	1.7	2.6	960
North East	95.9	934	55.0	43.5	21.8	22.5	7.7	2.5	26.5	7.5	10.6	2.4	1.9	895
North West	96.5	1,962	83.2	8.0	12.6	22.1	7.0	2.9	15.5	2.9	3.9	0.6	1.6	1,893
South East	94.7	793	39.1	41.9	15.8	6.2	9.5	3.2	48.8	7.3	18.1	10.9	3.3	752
South South	88.1	1,012	27.6	54.8	12.7	3.3	6.2	2.8	48.8	7.0	15.5	11.8	3.5	892
South West	93.2	1,194	36.5	48.5	43.9	25.3	18.1	6.0	46.5	18.4	22.4	5.8	2.5	1,112
Education														
No education	91.3	2,477	72.8	17.7	14.1	21.0	6.7	2.7	15.7	4.9	4.2	2.0	3.0	2,262
Primary	90.3	1,104	55.2	34.5	21.0	17.8	10.8	4.6	29.3	6.8	10.0	6.0	3.0	996
Secondary	93.7	2,640	44.3	41.7	25.2	14.2	11.3	2.9	42.1	8.5	15.7	6.0	2.4	2,475
More than secondary	97.0	794	44.3	48.2	39.8	13.9	14.3	6.2	52.3	15.3	26.6	6.0	0.2	770
Wealth quintile														
Lowest	93.1	1,150	77.1	17.0	12.8	19.6	7.1	3.2	10.6	3.8	1.2	0.9	2.7	1,071
Second	90.9	1,241	68.7	22.2	14.6	19.2	7.2	2.2	17.0	3.8	4.4	3.4	3.1	1,128
Middle	90.4	1,354	55.0	35.5	17.8	17.0	8.6	3.0	28.6	6.3	11.1	5.7	2.8	1,224
Fourth	92.4	1,536	42.8	42.9	21.3	14.8	10.3	3.3	44.7	9.1	16.4	6.2	3.1	1,420
Highest	95.7	1,733	45.3	40.4	38.2	15.9	14.6	5.0	48.4	13.1	21.6	5.6	0.8	1,659
Total	92.7	7,015	55.9	33.0	22.4	17.1	10.0	3.5	32.2	7.8	12.1	4.6	2.4	6,503

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.3.2 presents state-level data regarding knowledge of ways to avoid malaria. In addition, Figure 4.2 shows trends from the 2010 and 2015 NMIS surveys in the various ways women mention that people can avoid getting malaria.

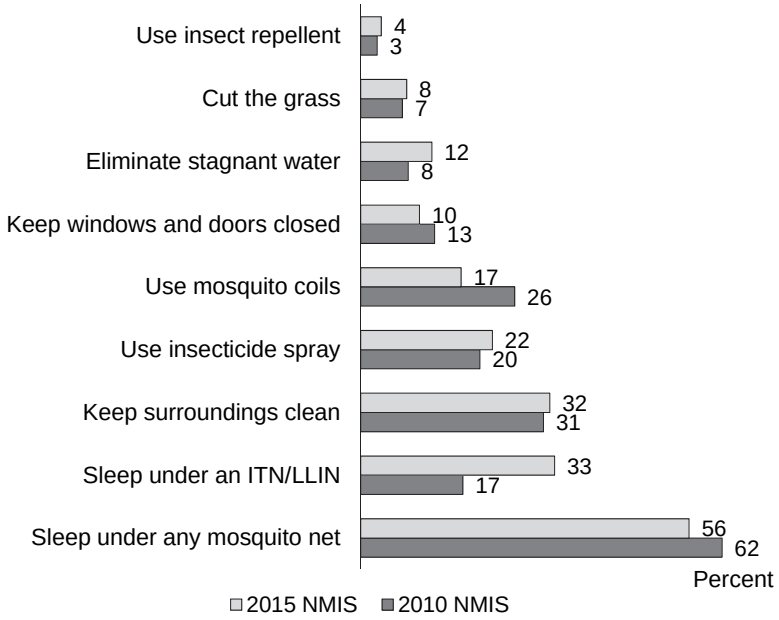
Table 4.3.2 Knowledge of ways to avoid malaria: States

Among women age 15-49 who have ever heard of malaria, 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, by state, Nigeria 2015

State	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 getting malaria: Sleep inside mosquito net	Sleep inside 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	Other	Don't know	Number of women
North Central														
FCT-Abuja	94.5	38	25.0	47.8	14.2	0.6	5.4	3.4	40.5	8.0	11.0	2.1	1.6	36
Benue	79.0	219	18.5	58.2	40.2	7.4	21.6	1.8	22.2	2.4	4.1	0.0	3.1	173
Kogi	85.3	178	72.8	19.6	35.1	9.9	23.4	8.4	57.2	18.8	22.0	3.0	0.0	152
Kwara	83.8	132	53.2	34.4	31.1	8.8	7.7	2.9	33.5	5.7	15.0	3.8	9.1	111
Nasarawa	87.7	107	57.9	32.8	24.4	4.3	10.3	7.0	19.1	7.0	13.1	6.8	1.7	93
Niger	77.3	215	81.6	7.4	16.5	14.2	3.0	1.4	17.0	0.0	2.8	0.0	3.8	166
Plateau	99.1	231	96.4	14.8	39.1	29.0	10.4	1.1	8.6	7.1	8.5	0.3	0.3	229
North East														
Adamawa	93.8	151	49.9	51.1	34.3	10.8	13.1	1.6	22.3	2.7	4.7	3.5	2.6	142
Bauchi	96.0	268	57.7	37.6	10.4	15.1	5.4	0.5	22.8	6.5	11.1	3.1	0.4	257
Borno (urban)	100.0	39	72.6	48.7	62.5	68.8	22.5	28.4	24.5	22.5	9.2	1.0	0.0	39
Gombe	100.0	142	60.0	40.4	24.2	23.6	6.0	1.1	53.0	14.3	28.3	1.6	0.4	142
Taraba	90.1	139	64.8	30.0	30.4	32.3	10.4	3.2	24.5	9.9	5.0	1.3	4.0	125
Yobe	97.7	194	41.3	56.0	12.1	24.4	3.4	0.9	16.5	2.7	4.9	2.2	3.6	190
North West														
Jigawa	97.0	242	88.5	2.0	30.6	42.2	11.2	15.8	8.2	4.1	2.3	0.2	1.5	234
Kaduna	95.8	218	64.1	25.6	7.6	6.5	3.2	1.5	33.7	3.6	15.6	0.8	4.2	208
Kano	96.3	485	83.2	5.1	12.8	17.7	10.5	0.8	15.2	2.0	4.5	0.4	0.4	467
Katsina	97.6	483	87.6	6.0	12.0	19.8	3.1	0.4	14.6	1.6	2.4	1.2	2.4	471
Kebbi	95.2	173	80.6	6.4	8.2	18.7	12.6	1.1	17.3	4.9	1.5	0.0	2.4	164
Sokoto	94.6	165	83.3	1.4	5.6	18.9	4.6	2.6	12.1	5.1	0.7	0.7	0.5	156
Zamfara	97.1	197	89.4	15.2	6.5	36.0	3.7	2.1	8.6	2.4	0.0	0.0	0.0	191
South East														
Abia	97.0	119	46.1	14.1	8.2	10.6	15.7	8.3	50.1	11.9	11.0	6.6	3.3	116
Anambra	86.8	176	53.0	32.2	20.9	2.5	7.4	2.6	53.2	7.0	26.8	15.8	2.7	153
Ebonyi	99.3	150	79.6	31.8	18.8	12.4	9.0	3.1	35.9	4.1	10.4	20.8	2.5	149
Enugu	97.8	161	9.5	72.7	12.3	1.0	15.5	1.4	40.9	1.7	8.9	1.7	4.2	158
Imo	94.5	187	14.7	49.5	17.0	6.1	2.3	2.0	62.0	12.1	29.8	9.4	3.8	177
South South														
Akwa Ibom	78.1	177	42.9	58.4	5.6	2.4	7.9	0.9	33.2	1.0	10.7	31.9	2.4	138
Bayelsa	95.5	124	54.1	39.0	18.0	11.7	5.2	3.9	58.7	13.9	19.2	10.3	3.1	118
Cross River	83.6	142	39.3	39.3	3.9	1.5	4.7	1.5	36.2	2.5	10.7	14.0	2.1	119
Delta	93.9	127	22.7	57.3	11.4	2.7	8.3	7.1	42.9	1.9	3.7	6.6	4.5	119
Edo	88.2	86	57.1	13.3	15.0	1.7	3.4	3.7	54.4	7.8	23.1	4.1	5.4	76
Rivers	90.1	356	1.6	73.9	17.0	2.0	6.2	2.0	57.5	10.4	20.6	6.6	4.0	320
South West														
Ekiti	94.0	87	28.8	50.8	15.9	9.9	7.8	0.8	20.5	12.0	25.8	19.4	0.8	82
Lagos	95.0	296	59.1	19.6	53.3	18.7	20.7	4.3	46.6	9.1	7.9	5.5	1.0	281
Ogun	96.0	138	13.3	69.0	29.5	13.7	4.9	2.5	48.5	0.8	25.4	14.6	0.4	132
Ondo	78.5	118	8.5	38.0	25.9	9.1	10.0	0.0	32.0	9.1	2.9	4.1	16.8	93
Osun	90.0	230	25.1	50.9	8.0	8.0	11.3	0.7	44.0	5.4	23.7	4.9	2.7	207
Oyo	97.6	324	43.7	66.5	77.6	56.2	30.6	15.4	58.2	47.0	38.1	0.0	0.7	317
Total	92.7	7,015	55.9	33.0	22.4	17.1	10.0	3.5	32.2	7.8	12.1	4.6	2.4	6,503

Note: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Figure 4.2 Trends in knowledge of ways to avoid malaria



4.1.4 Knowledge of Ways Pregnant Women Can Avoid Getting Malaria

Women who said there are ways to avoid getting malaria were asked to cite specific ways for pregnant women to avoid getting malaria. Tables 4.4.1 and 4.4.2 present this information at the national and state levels.

Nationally, 54 percent of women report that sleeping inside any type of mosquito net helps pregnant women avoid getting malaria. Thirty percent of women specifically state that sleeping inside an ITN or LLIN can help pregnant women avoid malaria, and the same percentage report that the environment should be kept clean. Twenty-one percent of women report that taking SP as a part of antenatal care (ANC) can help pregnant women avoid getting malaria, and 2 percent report that pregnant women can take daraprim tablets.

Table 4.4.1 Knowledge of ways for pregnant women to avoid getting malaria: National

Among women age 15-49 who say there are ways to avoid getting malaria, the percentage who cite specific ways that pregnant women can avoid getting malaria, by background characteristics, Nigeria 2015

	Among women who say there are ways to avoid getting malaria, percentage who cite specific ways that pregnant women can avoid getting malaria							
Background characteristic	Sleep inside mosquito net	Sleep inside an ITN/LLIN	Keep environment clean	Take SP given during antenatal care	Take daraprim tablets (Sunday-Sunday medicine)	Other	Don't know	Number of women
Age								
15-19	53.7	25.4	24.6	10.8	1.4	2.7	17.2	1,099
20-24	56.8	25.2	25.1	18.3	1.3	3.6	10.9	1,244
25-29	53.9	29.8	30.1	23.5	2.0	4.5	7.7	1,309
30-34	56.6	31.1	32.1	25.5	2.7	4.8	5.7	1,056
35-39	51.3	35.3	33.7	24.7	2.5	6.2	6.3	805
40-44	55.2	32.6	32.9	26.2	2.5	4.4	6.9	612
45-49	39.1	38.9	35.1	27.9	2.5	5.7	9.3	379
Residence								
Urban	48.4	35.1	40.1	29.3	3.1	4.5	9.0	2,697
Rural	57.6	26.1	22.0	15.7	1.2	4.2	9.7	3,806
Zone								
North Central	60.9	21.2	26.2	17.4	0.5	3.8	12.0	960
North East	50.0	43.1	25.5	23.4	1.8	2.2	10.3	895
North West	83.5	8.2	15.6	9.5	0.1	0.9	4.2	1,893
South East	35.2	37.3	36.7	23.6	5.2	5.0	14.9	752
South South	24.4	47.3	31.1	27.3	3.5	12.3	12.9	892
South West	36.3	44.5	53.3	37.0	3.5	5.6	8.9	1,112
Education								
No education	71.2	17.1	17.9	11.2	0.7	2.0	7.9	2,262
Primary	53.5	30.5	27.1	23.4	1.9	5.1	8.2	996
Secondary	41.0	36.0	36.1	25.9	2.9	5.7	12.8	2,475
More than secondary	44.0	46.6	45.5	34.1	3.4	5.9	4.7	770
Wealth quintile								
Lowest	74.7	16.1	13.2	6.9	0.5	1.2	8.0	1,071
Second	66.6	20.0	16.5	11.2	0.9	2.4	9.0	1,125
Middle	51.1	32.2	27.5	22.2	0.8	4.5	10.3	1,233
Fourth	42.2	37.1	36.1	26.2	2.2	6.7	10.7	1,417
Highest	43.6	37.5	44.8	32.8	4.5	5.6	8.9	1,658
Total	53.8	29.9	29.5	21.4	2.0	4.3	9.4	6,503

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.4.2 Knowledge of ways for pregnant women to avoid getting malaria: States

Among women age 15-49 who say there are ways to avoid getting malaria, the percentage who cite specific ways that pregnant women can avoid getting malaria, by state, Nigeria 2015

	Among women who say there are ways to avoid getting malaria, percentage who cite specific ways that pregnant women can avoid getting malaria							
State	Sleep inside mosquito net	Sleep inside an ITN/LLIN	Keep environment clean	Take SP given during antenatal care	Take daraprim tablets (Sunday-Sunday medicine)	Other	Don't know	Number of women
North Central								
FCT-Abuja	21.0	46.2	31.7	2.3	0.0	0.0	18.6	36
Benue	15.5	46.1	24.2	27.0	0.0	1.1	19.2	173
Kogi	74.8	18.2	59.9	35.2	0.0	11.9	3.0	152
Kwara	46.9	25.1	54.0	19.6	0.9	10.6	14.1	111
Nasarawa	59.4	25.8	12.1	15.3	0.6	2.6	13.3	93
Niger	67.2	5.6	9.5	3.5	0.0	0.7	22.0	166
Plateau	95.1	8.2	8.7	10.7	1.2	0.3	2.6	229
North East								
Adamawa	34.0	49.2	16.2	15.7	0.0	3.1	23.5	142
Bauchi	50.1	41.5	15.9	20.4	0.0	3.3	10.9	257
Borno (urban)	73.7	41.7	51.1	56.4	24.6	0.0	1.0	39
Gombe	57.7	38.8	44.8	44.9	1.0	1.8	1.6	142
Taraba	62.1	26.3	42.2	22.1	3.7	2.1	17.1	125
Yobe	43.1	55.1	14.8	11.3	0.3	0.7	3.6	190
North West								
Jigawa	91.8	2.8	18.4	4.5	0.0	0.7	7.4	234
Kaduna	61.4	24.1	22.3	4.7	0.5	0.5	10.9	208
Kano	79.6	8.5	17.8	15.0	0.0	2.0	3.7	467
Katsina	88.3	6.1	6.0	12.8	0.0	1.2	2.9	471
Kebbi	83.3	6.0	32.4	3.7	0.0	0.0	1.3	164
Sokoto	88.7	0.7	16.4	5.2	0.0	0.0	3.2	156
Zamfara	91.1	9.9	7.6	7.7	0.7	0.0	1.3	191
South East								
Abia	50.3	9.9	30.2	19.8	1.9	3.3	17.8	116
Anambra	49.1	31.7	50.9	29.3	10.3	6.6	11.1	153
Ebonyi	59.6	22.1	30.7	31.4	7.3	9.8	21.2	149
Enugu	9.3	71.9	36.7	17.9	1.4	0.3	7.9	158
Imo	16.0	42.0	33.8	19.8	4.7	4.8	17.3	177
South South								
Akwa Ibom	38.8	41.4	17.3	29.1	0.3	29.9	13.6	138
Bayelsa	40.9	41.6	50.3	31.6	4.1	12.5	6.9	118
Cross River	36.3	38.3	24.1	9.5	6.1	5.0	12.0	119
Delta	23.0	54.2	39.6	6.8	5.1	10.3	9.2	119
Edo	54.6	11.8	28.0	29.1	2.7	5.8	17.3	76
Rivers	1.1	61.2	30.2	38.9	3.2	9.7	15.6	320
South West								
Ekiti	35.1	42.6	20.4	55.3	2.1	11.9	11.5	82
Lagos	59.1	20.5	56.8	36.0	9.5	6.5	9.7	281
Ogun	7.6	62.9	35.9	39.7	0.6	15.4	3.9	132
Ondo	12.5	37.4	46.6	5.0	0.0	2.3	27.4	93
Osun	23.8	40.3	32.8	25.9	0.7	5.6	12.2	207
Oyo	43.7	63.5	81.3	48.5	2.6	0.0	1.9	317
Total	53.8	29.9	29.5	21.4	2.0	4.3	9.4	6,503

Notes: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Nationally, 9 percent of women responded that they do not know of anything that would prevent pregnant women from getting malaria. Figure 4.3 shows that the percentages of women who do not know of any way to avoid malaria vary widely by state, ranging from 1 percent among those in Borno (urban), Zamfara, and Kebbi to 27 percent among those in Ondo.

Figure 4.3 **Percentage of women age 15-49 who do not know ways to avoid malaria during pregnancy, by state**

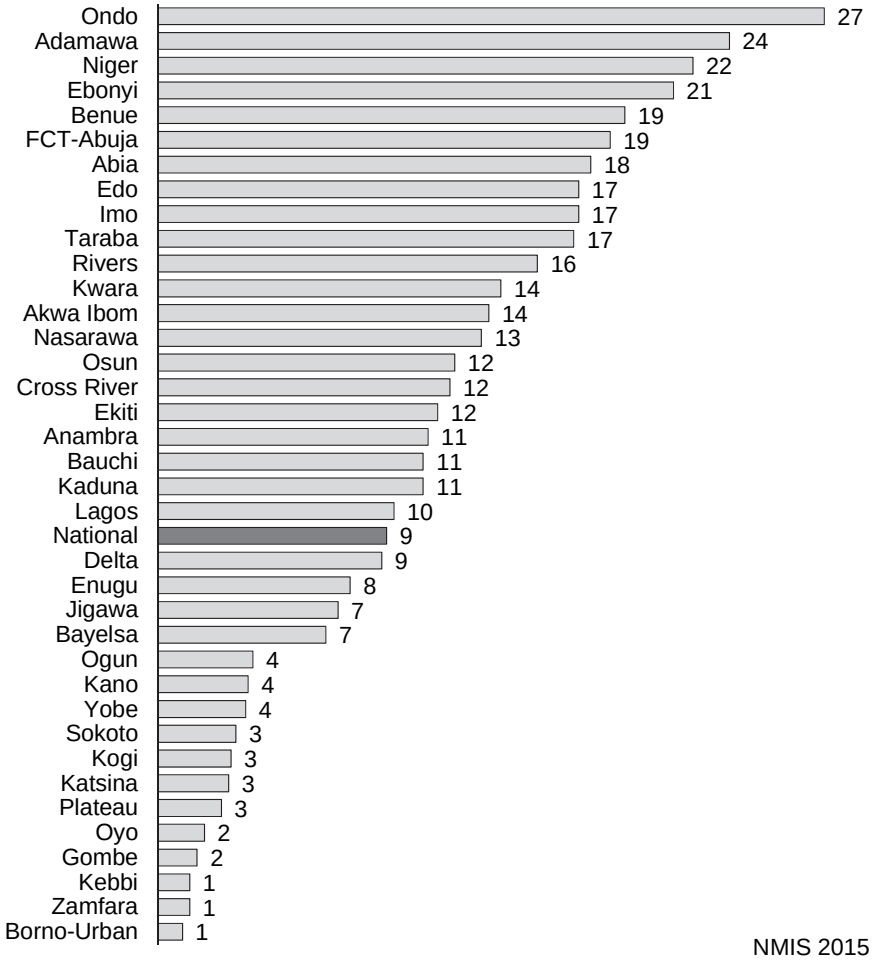
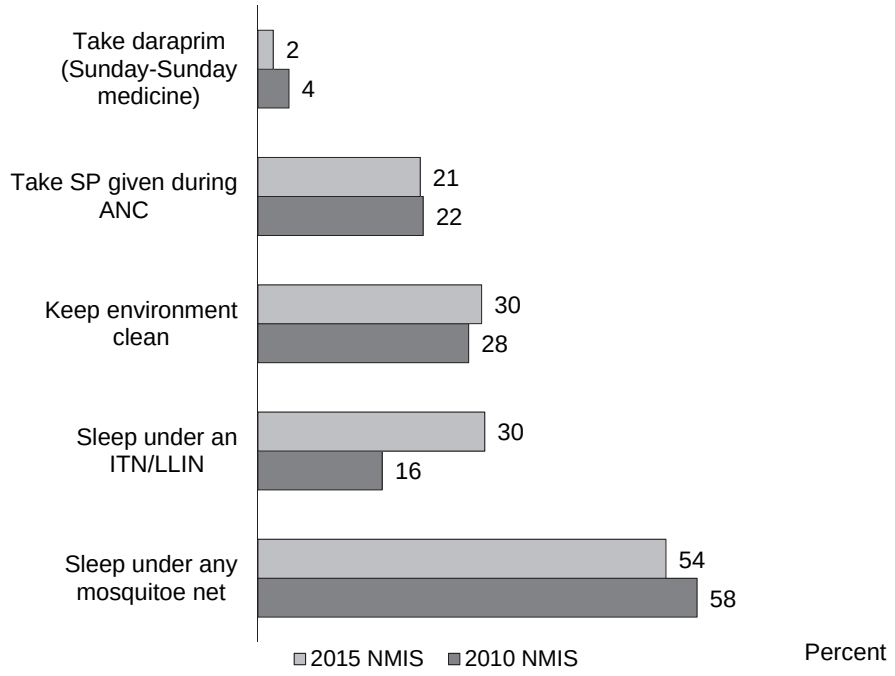


Figure 4.4 shows trend data from the 2010 and 2015 NMIS surveys among women who report knowing ways to prevent pregnant women from getting malaria. The percentage of women who report that sleeping inside an ITN or LLIN helps pregnant women avoid malaria increased from 16 percent in 2010 to 30 percent in 2015.

Figure 4.4 **Trends in knowledge of ways pregnant women can avoid malaria**



4.1.5 Knowledge of Malaria Treatment

In the 2015 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 and children. Tables 4.5.1 and 4.5.2 present information on women's knowledge of malaria treatment at the national and states levels, respectively. Overall, 95 percent of women report that malaria is treatable. Among these women, 26 percent report that artemisinin-based combination therapy (ACTs) can be for malaria treatment; and 20 percent report that aspirin, Panadol, or Paracetamol can be used to treat malaria. Other answers regarding malaria medicines include SP (19 percent), chloroquine (17 percent), and artesunate (14 percent). Twenty percent of women report not knowing of any specific medicine to treat malaria.

Regarding malaria medicines for children, 27 percent of women report that malaria can be treated with ACT; 23 percent mention aspirin, Panadol, or Paracetamol; 17 percent cite chloroquine; 12 percent cite artesunate; and 10 percent mention SP. Twenty-four 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 used to treat malaria is higher among urban than rural women and increases with increasing education and wealth. It is also higher among women in South West Zone than among women in other zones.

Table 4.5.1 Knowledge of malaria treatment in general and in children: National

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, percentage who cite specific medicines that can be given in general and to children, by background characteristics, Nigeria 2015

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: SP	Chloroquine	Artesunate	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	Among women who say malaria can be treated, percentage who cite specific medicines for children: SP	Chloroquine	Artesunate	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	Number of women
Age																			
15-19	95.3	1,160	13.1	15.3	10.2	3.1	26.0	21.2	3.4	24.9	7.0	13.6	9.0	4.5	24.1	20.8	2.2	32.2	1,106
20-24	94.5	1,340	18.4	16.6	11.3	3.9	23.4	18.0	3.4	24.0	10.2	15.6	9.5	4.4	25.1	21.0	2.6	29.3	1,267
25-29	95.0	1,419	20.5	16.0	15.3	4.7	26.5	20.4	6.2	19.4	10.4	16.0	12.8	5.1	28.4	24.1	3.5	22.5	1,348
30-34	94.8	1,159	22.1	15.9	15.0	4.7	26.3	20.3	5.3	18.2	10.0	16.9	13.4	5.9	27.8	24.6	3.1	21.6	1,098
35-39	95.8	869	21.7	20.8	15.3	5.1	27.3	19.9	6.0	16.0	10.9	21.0	13.9	6.1	28.1	24.4	4.2	16.5	832
40-44	97.2	651	19.0	20.2	14.4	6.0	25.1	19.6	5.8	19.5	11.9	20.0	11.2	8.7	27.4	25.5	2.8	21.8	633
45-49	97.1	416	18.9	21.6	15.0	10.0	28.8	17.3	7.1	16.7	11.2	19.5	11.8	9.1	30.1	23.6	4.1	19.0	404
Residence																			
Urban	97.4	2,846	23.9	17.3	19.8	6.7	34.1	19.3	5.7	11.5	13.6	17.4	16.7	7.9	33.2	23.0	3.3	16.4	2,772
Rural	94.0	4,169	15.6	17.3	9.2	3.4	20.1	20.0	4.6	26.7	7.4	16.5	8.0	4.1	22.5	23.3	2.9	29.7	3,918
Zone																			
North Central	94.3	1,120	13.9	14.7	14.5	4.3	29.8	19.5	3.1	24.6	9.0	12.8	12.0	6.0	29.0	20.3	3.2	29.2	1,056
North East	96.7	934	26.5	23.6	14.7	5.1	26.3	19.3	1.5	20.0	17.7	24.5	14.0	6.4	29.6	23.5	1.4	19.3	903
North West	93.2	1,962	19.6	12.9	4.5	3.0	19.9	21.1	3.5	26.4	8.2	14.5	5.1	2.6	23.3	25.2	1.7	28.1	1,828
South East	98.6	793	15.0	16.2	19.6	5.5	25.0	9.5	7.2	16.4	8.6	12.7	15.4	6.2	21.0	10.1	2.8	26.2	783
South South	98.4	1,012	16.8	22.2	15.6	5.4	26.7	15.0	7.5	21.2	6.4	19.2	10.2	4.9	27.1	18.9	4.1	30.4	996
South West	94.1	1,194	21.8	18.4	20.4	6.9	31.5	29.5	8.6	9.1	11.6	19.3	18.4	10.4	32.6	35.5	6.0	10.2	1,124
Education																			
No education	92.0	2,477	17.0	13.6	5.6	3.1	16.8	20.7	4.9	29.9	9.1	14.0	5.9	3.4	20.2	24.2	2.9	31.0	2,280
Primary	95.4	1,104	19.4	20.9	10.7	4.5	23.3	20.1	6.3	20.5	10.2	20.6	10.0	5.7	25.7	24.2	3.7	23.0	1,053
Secondary	97.7	2,640	18.2	18.2	16.5	5.3	29.0	19.9	5.2	16.8	9.6	17.0	13.8	6.7	28.5	22.4	3.3	22.5	2,578
More than secondary	98.1	794	27.4	20.3	31.1	8.5	45.9	15.8	3.2	4.4	13.7	19.9	23.1	9.0	43.0	21.3	2.2	11.6	778
Wealth quintile																			
Lowest	90.4	1,150	14.9	14.0	2.5	2.1	12.6	25.2	4.4	31.3	7.0	13.4	3.1	1.9	17.6	28.8	2.4	32.6	1,039
Second	93.0	1,241	19.0	15.4	5.9	3.0	19.9	16.7	4.9	30.9	8.8	16.7	6.5	3.2	23.9	20.6	3.1	32.0	1,153
Middle	95.0	1,354	13.9	19.6	10.9	3.8	22.3	17.4	4.4	24.5	9.3	18.6	7.9	5.4	22.9	21.4	3.1	27.0	1,287
Fourth	97.9	1,536	22.1	21.8	17.1	6.8	28.1	22.7	6.8	13.5	10.6	20.2	15.1	8.3	27.2	25.4	3.8	20.0	1,505
Highest	98.4	1,733	22.8	15.0	24.4	6.5	38.7	17.5	4.4	9.7	12.5	14.9	19.9	7.6	37.4	20.9	2.9	15.4	1,705
Total	95.4	7,015	19.1	17.3	13.6	4.8	25.9	19.7	5.0	20.4	10.0	16.9	11.6	5.7	26.9	23.2	3.1	24.2	6,689

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.5.2 Knowledge of malaria treatment in general and in children: States

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, percentage who cite specific medicines that can be given in general and to children, by background characteristics, Nigeria 2015

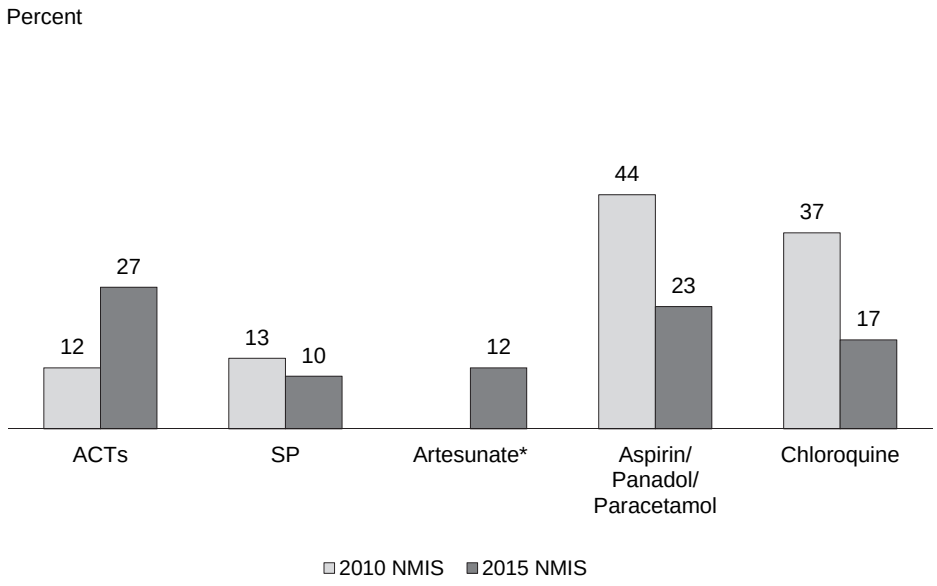
State	Percentage who say malaria can be treated	Number of women	Among women who say malaria can be treated, percentage who cite specific medicines:								Among women who say malaria can be treated, percentage who cite specific medicines for children:								
			SP	Chloroquine	Artesunate	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	SP	Chloroquine	Artesunate	Quinine	ACT	Aspirin/ Panadol/ Paracetamol	Other	Don't know	Number of women
North Central																			
FCT-Abuja	96.8	38	6.1	3.7	10.6	1.4	52.2	6.6	2.3	20.7	5.3	5.9	8.0	3.0	44.5	7.4	1.5	32.1	36
Benue	89.9	219	11.7	31.4	25.2	4.3	35.2	3.7	2.9	16.6	3.9	21.1	20.1	6.3	31.3	5.7	2.3	25.4	197
Kogi	100.0	178	14.4	20.9	19.5	9.3	21.4	47.0	4.1	13.3	6.1	21.3	15.0	20.3	17.7	49.4	4.5	19.5	178
Kwara	94.3	132	21.9	20.6	26.6	13.3	8.1	38.4	8.7	19.2	24.3	15.5	21.4	9.9	10.9	39.6	9.6	20.3	124
Nasarawa	89.6	107	4.8	8.3	8.6	2.1	8.9	1.3	0.6	50.0	3.0	10.1	8.6	0.5	7.4	1.3	0.6	60.3	95
Niger	89.8	215	1.5	2.7	2.3	0.5	8.0	5.4	3.8	57.3	0.0	2.9	1.4	0.6	14.0	6.3	3.6	57.0	193
Plateau	100.0	231	26.3	6.7	8.3	0.0	66.6	22.8	0.0	5.9	17.8	8.0	8.6	0.0	64.3	21.4	0.5	8.4	231
North East																			
Adamawa	95.2	151	17.8	29.5	2.7	0.0	24.5	26.7	0.0	30.4	16.1	37.6	2.3	0.0	26.3	31.6	1.4	26.5	144
Bauchi	97.9	268	10.4	16.3	3.3	0.9	19.2	25.7	0.8	33.1	2.8	19.3	7.5	1.8	19.4	30.2	1.9	31.6	262
Borno (urban)	100.0	39	22.3	18.0	23.3	2.9	69.0	11.6	0.0	8.2	20.2	34.2	23.3	10.2	62.7	12.0	0.0	9.0	39
Gombe	98.8	142	47.5	46.4	49.7	6.5	22.3	7.9	3.0	3.0	39.9	39.3	44.1	9.3	28.8	8.1	2.3	7.2	140
Taraba	89.5	139	30.1	18.3	20.6	24.6	21.8	9.2	1.9	22.0	29.5	18.8	19.6	28.0	25.3	14.9	0.5	20.5	124
Yobe	99.3	194	38.2	16.9	8.4	1.4	34.5	21.4	2.4	7.7	15.0	12.7	4.4	0.8	42.6	27.2	1.2	7.3	193
North West																			
Jigawa	82.5	242	7.7	4.4	0.0	0.5	3.3	10.6	4.3	70.5	6.9	2.6	0.2	0.2	4.2	11.1	3.8	72.7	200
Kaduna	88.7	218	5.6	22.4	6.5	4.3	4.9	12.0	1.3	56.1	2.6	23.1	4.9	7.7	1.6	14.4	0.5	58.5	193
Kano	97.8	485	6.8	15.6	6.3	0.8	31.1	17.4	1.3	8.6	5.1	18.6	7.0	0.0	31.6	18.2	0.4	9.5	474
Katsina	96.3	483	43.3	11.2	3.3	1.8	28.0	13.7	4.2	20.5	6.6	17.4	4.8	1.5	41.5	24.8	1.7	25.1	465
Kebbi	98.2	173	23.2	20.9	8.1	13.7	10.9	38.9	3.9	22.4	12.9	17.8	8.6	12.9	12.2	41.8	0.8	23.2	170
Sokoto	93.4	165	28.6	10.7	0.0	1.2	5.1	59.4	5.6	21.3	28.2	6.5	0.0	0.0	3.7	59.8	1.1	20.6	155
Zamfara	87.3	197	9.0	3.5	6.2	4.6	25.5	21.8	6.7	16.0	6.7	4.0	7.2	1.5	26.8	26.0	5.6	13.7	172
South East																			
Abia	99.6	119	10.2	8.5	26.4	3.5	23.5	3.2	3.0	18.6	4.7	7.8	29.3	1.9	17.3	1.9	0.8	29.8	119
Anambra	97.3	176	26.6	19.3	16.7	5.5	26.7	11.8	8.8	13.6	9.5	11.6	9.9	9.0	19.7	12.8	2.6	29.3	171
Ebonyi	97.2	150	27.6	24.5	18.4	13.0	32.2	20.6	18.4	17.3	25.7	20.6	16.9	11.2	28.5	25.1	7.7	24.2	146
Enugu	100.0	161	3.5	16.3	9.5	1.2	13.5	6.7	4.5	20.9	1.8	12.0	7.4	0.8	14.5	5.8	2.5	26.6	161
Imo	99.3	187	7.7	11.6	27.7	4.8	28.8	5.0	1.9	13.1	2.8	11.1	17.2	7.1	24.5	4.8	0.6	22.4	186
South South																			
Akwa Ibom	98.7	177	16.5	16.1	11.8	0.9	14.9	9.4	8.3	26.7	5.8	16.8	2.7	3.2	10.5	9.3	5.7	42.6	175
Bayelsa	100.0	124	14.1	39.6	20.4	14.4	16.0	40.4	7.0	13.8	12.2	39.2	14.1	14.4	13.6	46.2	7.2	13.0	124
Cross River	98.4	142	4.4	9.0	3.1	0.6	33.2	8.9	13.9	24.9	0.5	3.1	3.1	2.0	33.0	13.8	6.3	35.5	140
Delta	95.1	127	9.3	27.1	18.1	2.6	13.9	14.9	2.4	34.1	4.5	23.8	13.7	2.6	13.8	15.5	1.8	38.2	121
Edo	98.8	86	9.2	22.1	13.3	4.9	28.5	5.8	4.2	32.9	3.2	17.5	10.7	5.3	25.5	8.8	2.2	44.5	85
Rivers	98.8	356	27.3	22.6	20.6	7.6	37.9	13.4	7.3	12.3	8.4	18.7	14.0	4.1	42.6	19.6	2.7	22.3	352
South West																			
Ekiti	94.9	87	11.4	29.9	14.0	4.8	41.1	36.7	15.6	6.2	4.5	32.0	8.1	10.1	34.4	26.7	7.1	15.8	83
Lagos	99.4	296	21.5	19.6	34.6	14.8	30.7	4.3	5.7	8.8	20.1	22.7	33.2	16.8	32.6	4.6	4.2	9.7	294
Ogun	99.3	138	17.2	11.6	9.6	1.3	40.0	15.6	19.9	8.9	8.1	14.8	6.5	7.9	41.9	33.5	13.2	8.3	137
Ondo	83.0	118	4.9	13.6	8.4	4.1	18.5	21.8	8.2	29.8	0.0	16.1	6.3	5.8	22.9	20.6	9.0	27.5	98
Osun	98.8	230	20.6	8.3	10.9	1.0	7.3	37.8	9.9	6.9	1.0	10.8	7.9	2.8	10.9	46.4	6.3	11.3	227
Oyo	87.7	324	34.0	26.8	24.4	7.5	49.5	56.1	3.4	4.8	19.1	22.1	24.4	12.7	48.2	67.3	2.6	2.9	284
Total	95.4	7,015	19.1	17.3	13.6	4.8	25.9	19.7	5.0	20.4	10.0	16.9	11.6	5.7	26.9	23.2	3.1	24.2	6,689

Notes: Estimates for the North East Zone do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Results by state show that 5 percent of women in Kaduna State and 3 percent of women in Jigawa State report that ACTs can treat malaria in adults, while more than half of women in FCT-Abuja (52 percent) and Plateau State (67 percent) report that ACTs can be used to treat malaria.

Figure 4.5 shows trends in women's knowledge about medicines used to treat children with malaria. Although just over a quarter of women in the 2015 NMIS know that ACTs can be used to treat malaria in children, this is a two-fold increase over the percentage in the 2010 NMIS (12 percent). The percentage of women reporting chloroquine and aspirin, Panadol, or Paracetamol decreased by half between 2010 and 2015.

Figure 4.5 **Trends in knowledge of malaria treatment in children**



**Data not collected for artesunate in 2010 NMIS.*

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 6 months preceding the survey. Women who had heard or seen malaria prevention messages were then asked to cite specific messages. Tables 4.6.1 and 4.6.2 present these data at the national and state levels.

Table 4.6.1 shows that 36 percent of women had heard or seen a malaria prevention message in the 6 months preceding the survey. Among these women, the most common malaria prevention message reported was that "malaria is dangerous" (45 percent). Forty-three percent of women cited the "malaria can kill" message, while 39 percent cited "sleeping inside a mosquito net is important" and 31 percent cited "mosquitoes spread malaria." Smaller proportions of women were exposed to other messages.

Table 4.6.1 Exposure to malaria prevention messages: National

Among women age 15-49 who have ever heard of malaria, the percentage who have seen or heard any messages about malaria in the 6 months preceding the survey, and among those, the percentage who cite specific messages they saw or heard, by background characteristics, Nigeria 2015

	All women age 15-49		Among women age 15-49 who have seen or heard any message about malaria in the past 6 months, the percentage exposed to specific messages:														
Background characteristic	Percentage who have seen or heard a message about malaria in the past 6 months	Number of women	Malaria is dangerous	Malaria can kill	Mosquitoes spread malaria	Sleeping inside a mosquito net is important	Who should sleep inside a mosquito net	Seek treatment for fever	Seek treatment for fever promptly (within 24 hours)	Importance of house spraying	Environmental sanitation activities	Seek testing before treatment for malaria	Early registration for ANC	Pregnant women should take SP	Other	Don't know	Number of women exposed to a malaria message in the past 6 months
Age																	
15-19	30.8	1,376	42.0	42.1	28.4	40.0	6.4	11.9	7.1	3.3	20.9	6.1	2.9	3.0	0.7	1.3	423
20-24	32.8	1,533	45.8	36.7	30.5	36.6	8.7	10.4	7.6	2.3	15.8	5.7	4.4	4.3	2.7	3.2	503
25-29	34.1	1,636	47.9	48.1	30.1	38.3	9.7	14.1	10.3	3.3	14.3	9.0	6.5	5.8	2.2	2.0	558
30-34	39.1	1,325	40.7	42.5	32.8	40.7	9.6	17.8	11.3	2.8	16.6	7.8	7.6	6.7	3.6	1.9	518
35-39	39.2	971	45.2	46.3	32.8	37.1	10.8	14.4	10.6	2.5	19.7	10.7	4.2	4.3	3.1	2.2	381
40-44	39.2	729	51.4	39.6	33.7	40.2	9.5	15.6	9.9	3.6	17.6	8.0	5.8	4.7	3.1	1.9	286
45-49	41.9	464	41.5	47.3	32.6	39.3	10.0	12.7	14.3	2.4	21.2	10.1	5.6	4.6	5.2	1.2	194
Residence																	
Urban	43.8	3,129	50.8	47.8	37.2	40.3	12.8	18.3	14.3	4.3	21.7	12.6	8.7	8.3	2.4	1.7	1,372
Rural	30.4	4,905	39.5	38.7	25.8	37.3	5.8	9.8	5.7	1.6	13.6	3.7	2.3	1.8	3.0	2.4	1,490
Zone																	
North Central	25.7	1,357	58.7	52.6	39.8	27.3	4.6	11.6	7.2	3.4	13.6	5.3	3.5	0.7	2.6	2.3	349
North East	31.4	1,077	58.6	44.7	36.9	43.0	6.6	6.3	6.4	3.0	20.1	3.1	1.1	3.8	0.8	1.5	338
North West	34.9	2,359	38.3	26.2	20.6	43.3	4.0	12.3	4.9	0.8	9.3	2.2	0.3	1.9	1.6	0.6	823
South East	42.0	811	43.6	43.2	17.5	27.7	4.9	11.3	7.0	0.5	12.6	8.4	2.0	2.2	3.9	2.4	341
South South	38.0	1,080	24.5	44.2	13.9	33.0	2.2	4.6	4.4	0.7	19.3	5.4	1.2	1.4	6.9	5.9	410
South West	44.4	1,351	53.0	58.8	57.6	47.1	27.6	29.4	25.2	8.2	31.0	21.7	20.6	16.0	1.8	1.4	600
Education																	
No education	27.1	3,119	42.2	35.6	27.2	38.2	6.0	10.4	4.7	0.9	10.1	1.5	1.1	1.6	1.3	0.9	844
Primary	36.9	1,244	42.2	41.1	28.9	39.8	7.6	12.5	8.8	2.6	15.3	7.6	4.7	3.7	3.7	2.4	459
Secondary	38.7	2,848	46.6	46.6	33.7	38.2	9.9	15.4	11.6	3.8	22.1	10.3	7.4	6.5	2.4	2.6	1,102
More than secondary	55.6	823	48.5	50.2	35.4	40.3	14.8	18.2	15.9	4.8	22.2	14.8	9.0	8.2	5.1	2.4	457
Wealth quintile																	
Lowest	23.7	1,448	34.0	31.1	25.1	45.6	6.5	12.0	6.1	2.0	8.5	1.9	1.8	2.0	1.7	0.4	343
Second	28.8	1,530	42.0	36.4	27.1	39.5	5.7	8.4	5.8	2.0	14.1	1.7	2.5	2.0	2.0	1.6	440
Middle	33.2	1,564	48.6	45.4	26.9	36.2	6.8	11.8	5.9	0.8	16.3	6.7	2.7	2.3	2.4	2.1	519
Fourth	41.7	1,653	42.6	45.8	32.3	34.4	7.0	12.3	9.5	3.0	17.1	5.2	3.9	4.1	2.0	3.4	689
Highest	47.4	1,840	50.4	47.5	37.6	40.8	15.1	19.8	15.8	4.9	23.7	16.5	11.0	9.7	4.2	1.8	872
Total	35.6	8,034	44.9	43.1	31.3	38.8	9.2	13.9	9.8	2.9	17.5	8.0	5.4	4.9	2.7	2.1	2,862

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.

Table 4.6.2 Exposure to malaria prevention messages: States

Among women age 15-49 who have ever heard of malaria, the percentage who have seen or heard any messages about malaria in the 6 months preceding the survey, and among those, the percentage who cite specific messages they saw or heard, by state, Nigeria 2015

	All women age 15-49		Among women age 15-49 who have seen or heard any message about malaria in the past 6 months, the percentage exposed to specific messages:														
State	Percentage who have seen or heard a message about malaria in the past 6 months	Number of women	Malaria is dangerous	Malaria can kill	Mosquitoes spread malaria	Sleeping inside a mosquito net is important	Who should sleep inside a mosquito net	Seek treatment for fever	Seek treatment for fever promptly (within 24 hours)	Importance of house spraying	Environmental sanitation activities	Seek testing before treatment for malaria	Early registration for ANC	Pregnant women should take SP	Other	Don't know	Number of women exposed to a malaria message in the past 6 months
North Central																	
FCT-Abuja	30.6	46	43.6	41.1	4.1	11.8	2.1	2.1	0.0	2.1	17.4	0.0	1.5	1.5	8.2	8.6	14
Benue	26.3	267	69.2	67.7	48.6	25.9	11.2	20.7	5.6	0.0	19.6	9.6	3.7	0.0	0.0	0.0	70
Kogi	23.4	188	58.0	46.0	19.3	50.9	0.0	36.8	39.0	7.1	24.2	17.3	4.1	0.0	2.5	0.0	44
Kwara	25.5	195	(76.7)	(72.7)	(36.6)	(2.0)	(0.0)	(4.0)	(0.0)	(0.0)	(6.4)	(2.4)	(0.0)	(0.0)	(0.0)	(0.0)	50
Nasarawa	19.3	131	48.7	28.4	18.8	31.2	6.7	21.0	1.7	0.0	12.9	4.4	3.9	1.7	2.3	16.0	25
Niger	19.7	285	(29.9)	(29.2)	(43.9)	(24.9)	(0.0)	(0.0)	(0.0)	(0.0)	(6.3)	(2.1)	(7.9)	(2.1)	(6.3)	(2.1)	56
Plateau	36.6	244	64.0	56.1	53.6	33.6	6.9	2.5	4.0	9.4	12.0	0.7	2.5	0.7	3.1	1.7	90
North East																	
Adamawa	12.4	209	(30.4)	(7.3)	(26.6)	(70.0)	(21.1)	(21.3)	(18.0)	(11.9)	(42.1)	(6.8)	(0.0)	(3.2)	(3.4)	(5.0)	26
Bauchi	38.6	284	39.0	16.5	32.1	69.2	3.1	5.6	7.8	1.0	36.6	1.8	0.0	7.9	0.0	0.0	110
Borno (urban)	20.1	58	*	*	*	*	*	*	*	*	*	*	*	*	*	*	12
Gombe	44.3	155	88.9	85.4	69.6	26.9	0.0	0.6	0.6	0.9	2.7	1.2	1.4	0.7	0.0	0.0	69
Taraba	31.5	163	50.5	61.7	14.6	17.1	7.4	2.8	0.0	0.0	10.7	1.5	0.0	0.0	0.0	4.9	52
Yobe	34.2	207	69.5	44.7	22.9	25.2	7.0	4.3	5.1	1.3	7.4	1.1	0.0	0.0	2.8	1.7	71
North West																	
Jigawa	17.5	371	16.6	42.9	7.2	41.1	2.2	4.4	0.0	0.8	11.1	3.1	1.4	2.2	0.0	0.0	65
Kaduna	16.7	305	(53.2)	(38.8)	(14.8)	(35.1)	(13.4)	(44.6)	(14.9)	(0.0)	(17.4)	(5.9)	(0.0)	(0.0)	(3.2)	(4.5)	51
Kano	37.2	491	41.5	11.3	36.5	59.9	1.0	13.4	7.2	0.0	9.4	2.0	0.0	3.0	0.0	0.0	183
Katsina	55.1	519	19.8	9.1	14.7	57.1	4.5	9.8	3.2	2.0	12.5	2.5	0.6	1.3	4.1	0.6	286
Kebbi	46.2	198	78.1	55.8	10.7	5.9	1.1	2.4	0.0	0.0	3.8	1.7	0.0	1.7	0.0	0.8	92
Sokoto	39.2	178	49.3	55.3	18.7	8.6	0.0	6.4	0.8	0.0	0.8	0.8	0.0	0.9	0.0	0.0	70
Zamfara	26.3	297	50.3	41.0	33.3	35.8	11.6	21.4	12.8	1.1	4.4	0.0	0.0	3.8	0.0	0.0	78
South East																	
Abia	44.6	123	51.4	30.7	17.5	16.8	3.4	9.0	5.1	0.0	5.4	1.1	3.4	1.1	4.1	0.0	55
Anambra	47.4	177	43.0	29.0	10.8	46.8	5.8	22.2	14.2	2.2	18.6	17.6	1.6	5.3	1.9	5.3	84
Ebonyi	42.8	159	39.5	48.8	25.4	37.8	8.7	8.8	7.2	0.0	19.6	2.5	0.9	0.0	6.7	0.0	68
Enugu	57.8	162	48.8	68.3	17.3	14.5	0.5	4.3	4.5	0.0	5.1	7.1	0.8	0.0	0.0	0.8	94
Imo	21.1	189	(29.3)	(22.2)	(18.6)	(16.5)	(9.0)	(12.4)	(0.0)	(0.0)	(15.2)	(12.2)	(5.5)	(6.4)	(12.6)	(7.2)	40
South South																	
Akwa Ibom	60.0	187	9.0	26.8	11.1	46.4	3.3	3.1	3.3	0.0	15.4	6.5	0.9	1.0	8.0	12.4	112
Bayelsa	24.2	126	49.1	58.5	24.4	20.4	2.2	7.3	0.0	1.3	26.8	9.0	7.0	3.6	7.3	5.5	30
Cross River	47.2	151	35.9	24.3	15.4	53.4	1.4	2.5	1.3	1.2	23.1	4.7	0.0	0.5	1.8	2.1	71
Delta	28.6	144	(68.5)	(63.1)	(19.9)	(14.5)	(0.0)	(1.8)	(0.0)	(0.0)	(16.3)	(1.8)	(0.0)	(0.0)	(1.8)	(2.2)	41
Edo	21.0	112	(22.5)	(29.2)	(14.7)	(6.9)	(2.7)	(6.7)	(3.3)	(0.0)	(11.2)	(0.0)	(0.0)	(0.0)	(14.4)	(19.4)	23
Rivers	36.6	361	12.4	63.2	11.1	23.9	2.4	6.9	9.7	1.3	21.4	6.2	1.3	2.5	8.7	1.3	132
South West																	
Ekiti	37.2	99	37.2	30.2	33.8	47.4	7.7	17.8	21.4	2.0	8.5	0.0	1.4	5.0	0.0	0.0	37
Lagos	29.1	358	40.2	43.7	25.9	39.7	22.0	8.6	5.1	1.0	20.0	5.3	1.0	0.0	4.9	1.9	104
Ogun	30.9	151	40.4	66.9	6.7	26.9	2.0	11.3	20.5	0.0	11.5	5.3	3.1	1.5	4.3	0.0	47
Ondo	16.0	145	*	*	*	*	*	*	*	*	*	*	*	*	*	*	23
Osun	65.3	235	15.4	32.7	59.6	30.0	3.7	12.5	9.7	0.0	34.9	7.4	10.7	7.1	1.0	3.0	153
Oyo	65.1	362	86.9	86.5	87.6	69.9	56.4	58.0	47.9	20.2	43.7	47.1	44.2	35.0	0.9	0.0	236
Total	35.6	8,034	44.9	43.1	31.3	38.8	9.2	13.9	9.8	2.9	17.5	8.0	5.4	4.9	2.7	2.1	2,862

Notes: Estimates for the North East Zone do not include rural areas of Borno State. 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. Percentages may add up to more than 100.0 because multiple responses were allowed.

Women who reported hearing or seeing malaria prevention messages in the 6 months preceding the survey were also asked to cite the specific places where they were exposed to these messages. Table 4.7.1 shows the percentages of women who cite specific sources of malaria messages by background characteristics, and Table 4.7.2 presents these percentages by state.

The majority of women report hearing messages on the radio (70 percent), while 32 percent report seeing them on television. Seventeen percent of women say they were exposed to messages by a community worker. Eight percent say that they saw a malaria message on a billboard, poster, or T-shirt, and 7 percent say they were exposed to messages through a relative, friend, neighbour, or school.

Table 4.7.1 Sources of exposure to malaria prevention messages: National

Among women age 15-49 who have seen or heard any messages about malaria in the 6 months preceding the survey, the percentage who cite specific sources of malaria messages, by background characteristics, Nigeria 2015

	Among women age 15-49 who have seen or heard any message about malaria in the past 6 months, the percentage exposed to specific messages:												
Background characteristic	Radio	Television	Community worker[1]	Mosque/ church	Town announcer/community event	Billboards/ poster/ T-shirt	Leaflet/ factsheet/ brochure	Relative/ friend/ neighbour/ school	Social media	Antenatal care visit	Health centre or hospital	Other	Number of women exposed to a message
Age													
15-19	71.7	29.3	10.1	2.5	4.8	10.3	4.9	7.9	2.6	1.1	1.6	0.0	423
20-24	67.8	25.6	18.4	2.9	3.4	6.3	2.4	7.2	1.4	1.5	3.5	0.1	503
25-29	72.3	33.1	15.9	3.9	5.7	9.5	4.7	5.7	1.5	2.5	3.4	0.6	558
30-34	66.5	32.2	18.9	3.9	5.8	8.5	4.8	7.6	1.3	3.4	5.1	0.6	518
35-39	70.6	33.2	17.5	2.6	4.9	7.6	3.0	5.8	0.7	1.9	3.8	0.8	381
40-44	74.1	39.8	16.5	3.0	4.1	6.0	2.9	7.3	0.0	2.0	3.7	1.0	286
45-49	70.7	34.3	21.4	1.8	6.9	5.6	4.2	6.2	0.0	0.4	2.8	1.5	194
Residence													
Urban	73.7	49.1	14.0	2.7	4.6	11.6	7.2	6.9	2.1	2.2	3.3	0.6	1,372
Rural	67.0	15.9	19.1	3.5	5.3	4.7	0.9	6.8	0.4	1.8	3.7	0.5	1,490
Zone													
North Central	52.6	32.3	25.3	3.8	7.6	7.3	1.4	9.1	1.2	4.5	2.5	0.0	349
North East	73.6	31.2	14.5	2.1	2.6	1.9	0.4	5.3	0.7	0.8	1.8	0.4	338
North West	80.4	8.2	9.4	3.4	3.5	4.3	0.6	3.6	0.2	1.2	2.1	0.0	823
South East	63.2	33.9	14.1	0.8	9.0	2.5	2.1	6.9	1.9	1.0	2.1	3.0	341
South South	52.1	35.9	21.1	1.2	3.8	6.0	0.9	7.2	0.4	0.9	8.7	0.9	410
South West	80.9	60.2	21.2	5.5	5.4	21.4	14.8	10.6	3.2	3.5	4.2	0.0	600
Education													
No education	74.4	8.7	14.6	3.5	4.2	2.6	0.4	4.5	0.0	2.0	2.4	0.1	844
Primary	72.1	21.7	21.5	2.6	8.1	4.6	2.1	5.4	0.1	0.4	2.8	1.1	459
Secondary	66.7	41.6	17.3	2.8	5.1	10.9	5.5	9.1	2.1	2.2	4.2	0.7	1,102
More than secondary	69.1	60.9	14.2	3.6	2.9	14.3	8.2	7.2	2.5	3.1	4.4	0.4	457
Wealth quintile													
Lowest	73.9	2.5	13.6	3.0	5.6	5.1	0.8	6.4	0.0	0.9	2.8	0.0	343
Second	69.3	4.8	20.3	3.0	5.3	4.0	0.6	5.4	0.0	0.7	2.2	0.0	440
Middle	69.0	17.7	20.3	3.5	7.9	4.6	2.0	6.5	0.6	2.7	3.3	1.1	519
Fourth	70.5	33.4	19.0	3.3	4.6	5.2	2.2	6.7	1.2	2.1	4.8	1.1	689
Highest	69.7	64.1	12.0	2.8	3.1	15.4	9.2	8.1	2.8	2.6	3.6	0.2	872
Total	70.2	31.8	16.7	3.1	5.0	8.0	3.9	6.8	1.2	2.0	3.5	0.5	2,862

Notes: National estimates do not include rural areas of Borno State. Percentages may add up to more than 100.0 because multiple responses were allowed.
[1] Includes community health extension worker (CHEW), village health worker (VHW), role model caregiver (RMC), and community-directed distributor (CDD)

Table 4.7.2 Sources of exposure to malaria prevention messages: States

Among women age 15-49 who have seen or heard any messages about malaria in the 6 months preceding the survey, the percentage who cite specific sources of malaria messages, by state, Nigeria 2015

	Among women age 15-49 who have seen or heard any message about malaria in the past 6 months, the percentage exposed to specific messages:												
State	Radio	Television	Com-munity worker[1]	Mosque/ church	Town announ-cer/com-munity event	Bill-boards/ poster/ T-shirt	Leaflet/ factsheet/ brochure	Relative/ friend/ neigh-bour/ school	Social media	Antenatal care visit	Health centre or hospital	Other	Number of women exposed to a message
North Central													
FCT-Abuja	49.7	85.7	0.0	0.0	0.0	3.1	2.1	0.0	1.5	0.0	0.0	0.0	14
Benue	31.9	27.1	23.6	13.9	1.0	8.4	4.2	40.1	5.7	3.7	5.7	0.0	70
Kogi	43.4	52.4	25.1	5.8	12.0	26.7	0.0	0.0	0.0	0.0	1.5	0.0	44
Kwara	(87.5)	(55.6)	(15.1)	(2.0)	(8.1)	(6.9)	(2.0)	(2.0)	(0.0)	(0.0)	(0.0)	(0.0)	50
Nasarawa	19.6	40.9	27.6	0.0	15.2	2.2	2.3	0.0	0.0	1.0	3.7	0.0	25
Niger	(37.2)	(14.5)	(29.9)	(0.0)	(13.1)	(2.1)	(0.0)	(0.0)	(0.0)	(15.6)	(4.2)	(0.0)	56
Plateau	73.3	14.0	32.8	0.0	6.0	2.5	0.0	3.0	0.0	4.6	0.8	0.0	90
North East													
Adamawa	(76.6)	(15.0)	(20.8)	(1.9)	(5.9)	(0.0)	(0.0)	(11.7)	(0.0)	(3.2)	(0.0)	(0.0)	26
Bauchi	73.5	29.1	4.4	0.0	0.0	4.4	0.6	5.4	2.1	1.8	3.3	0.0	110
Borno (urban)	*	*	*	*	*	*	*	*	*	*	*	*	12
Gombe	91.8	64.4	27.5	0.7	3.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	69
Taraba	57.2	8.6	26.7	8.5	0.9	0.8	1.5	13.3	0.0	0.0	2.2	0.0	52
Yobe	65.0	19.8	7.7	2.7	6.7	1.7	0.0	3.0	0.0	0.0	1.3	1.7	71
North West													
Jigawa	48.6	0.7	0.8	36.8	4.8	2.2	0.0	5.7	0.0	8.1	17.8	0.0	65
Kaduna	(71.6)	(37.5)	(32.5)	(5.4)	(2.0)	(10.9)	(3.2)	(0.0)	(0.0)	(2.0)	(0.0)	(0.0)	51
Kano	92.7	15.3	4.1	0.0	0.0	1.0	0.0	0.0	0.0	1.1	1.0	0.0	183
Katsina	85.9	2.8	8.2	0.5	7.2	8.9	1.3	0.7	0.7	0.0	0.0	0.0	286
Kebbi	89.0	6.5	4.9	0.0	1.1	0.0	0.0	0.9	0.0	0.0	3.4	0.0	92
Sokoto	62.7	8.1	1.7	0.0	0.0	0.0	0.0	31.2	0.0	0.0	0.0	0.0	70
Zamfara	69.5	1.1	30.8	0.0	3.6	1.1	0.0	1.5	0.0	2.2	1.1	0.0	78
South East													
Abia	67.9	41.9	13.7	0.0	7.2	1.9	0.8	0.8	1.9	0.0	0.0	1.6	55
Anambra	49.9	41.8	15.8	1.1	5.9	3.3	2.2	22.6	5.4	3.1	4.6	5.6	84
Ebonyi	77.4	35.8	9.1	2.5	16.0	1.4	2.1	0.0	0.0	1.3	1.4	0.0	68
Enugu	67.5	25.5	20.0	0.0	11.6	0.0	1.3	3.2	0.9	0.0	1.7	0.9	94
Imo	(50.5)	(22.8)	(5.8)	(0.0)	(0.0)	(9.5)	(5.9)	(3.2)	(0.0)	(0.0)	(2.3)	(9.5)	40
South South													
Akwa Ibom	60.2	25.4	6.1	1.0	2.9	1.0	0.0	16.7	0.0	1.0	10.4	0.0	112
Bayelsa	53.0	55.8	14.5	3.6	3.6	13.0	0.0	0.0	0.0	0.0	11.3	3.7	30
Cross River	44.9	22.7	40.0	0.0	7.0	2.1	0.0	6.3	0.0	1.1	14.0	1.6	71
Delta	(51.4)	(54.9)	(19.2)	(0.0)	(0.0)	(3.9)	(1.8)	(7.0)	(0.0)	(0.0)	(0.0)	(3.9)	41
Edo	(40.5)	(45.3)	(4.2)	(0.0)	(0.0)	(0.0)	(6.9)	(2.0)	(6.5)	(0.0)	(0.0)	(0.0)	23
Rivers	51.0	39.8	28.8	2.0	4.7	12.5	1.0	2.2	0.0	1.3	8.1	0.0	132
South West													
Ekiti	73.1	46.0	21.0	2.0	0.0	6.9	0.0	0.0	0.0	2.0	1.4	0.0	37
Lagos	57.8	70.4	22.2	3.4	2.6	3.2	0.0	3.1	0.0	0.0	0.0	0.0	104
Ogun	61.5	23.7	10.8	3.2	4.5	6.6	3.3	7.2	2.1	5.3	4.9	0.0	47
Ondo	*	*	*	*	*	*	*	*	*	*	*	*	23
Osun	87.7	47.0	14.7	1.8	2.4	3.6	0.9	16.8	0.0	3.6	8.2	0.0	153
Oyo	90.3	76.4	29.2	10.5	10.0	47.9	36.5	13.3	7.7	5.4	4.1	0.0	236
Total	70.2	31.8	16.7	3.1	5.0	8.0	3.9	6.8	1.2	2.0	3.5	0.5	2,862

Notes: Estimates for the North East Zone do not include rural areas of Borno State. 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. Percentages may add up to more than 100.0 because multiple responses were allowed.

[1] Includes community health extension worker (CHEW), village health worker (VHW), role model caregiver (RMC), and community directed distributor (CDD)

4.3 MANAGEMENT OF FEVER AMONG CHILDREN

Table 4.8 shows the percentage of children under age 5 with a fever in the 2 weeks preceding the survey and the percentage of these children who took antimalarial drugs on the same day or next day following the onset of the fever, by background characteristics.

Mothers report that 41 percent of children under age 5 had a fever during the 2 weeks preceding the interview. Children age 24-35 months were most likely to have had a fever in the past 2 weeks (47 percent), while children less than age 12 months were least likely to have had a fever (31 percent). Boys and girls were equally likely to have had a fever. Variation by urban-rural residence are observed. The prevalence was lowest in the South West Zone (24 percent) and highest in the North West Zone (52 percent). The prevalence of fever declines with an increase in mother's education and wealth.

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

Percentage of children under age 5 with fever in the 2 weeks preceding the survey; and among children under age 5 with fever, the percentage for whom advice or treatment was sought, the percentage for whom advice or treatment was sought the same or next day following the onset of fever, and the percentage who had blood taken from a finger or heel, by background characteristics, Nigeria 2015

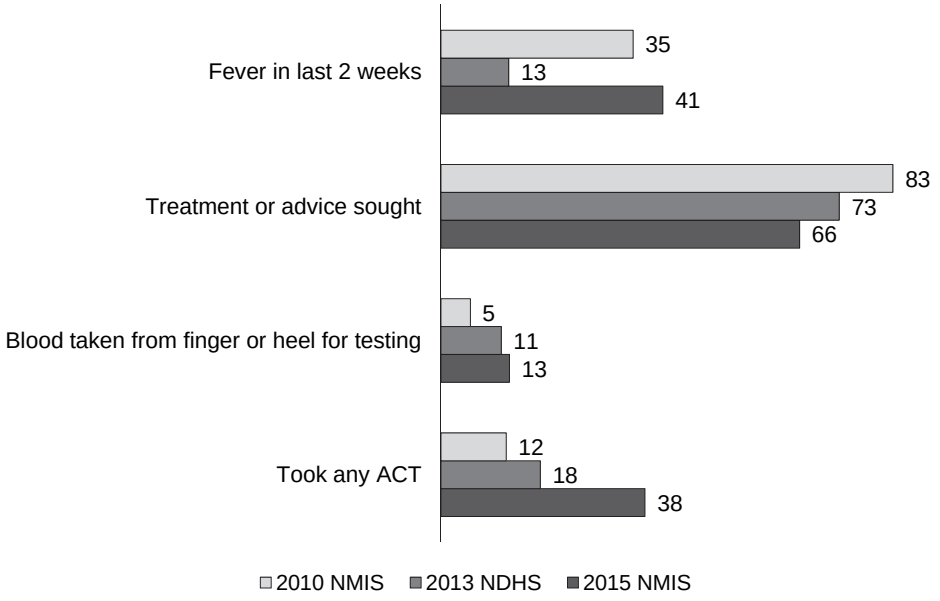
	Among children under age 5:		Among children under age 5 with fever:			
Background characteristic	Percentage with fever in the 2 weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought[1]	Percentage for whom advice or treatment was sought[1] the same or next day	Percentage who had blood taken from a finger or heel for testing	Number of children
Age (in months)						
<12	31.3	1,242	61.8	31.4	10.7	389
12-23	44.3	1,273	70.4	33.0	13.4	564
24-35	47.2	1,209	65.9	37.2	13.0	570
36-47	42.5	1,350	66.3	40.6	14.6	574
48-59	39.0	1,288	64.5	33.0	10.5	503
Sex						
Male	41.0	3,255	64.1	33.9	11.9	1,335
Female	40.7	3,109	68.1	37.0	13.3	1,265
Residence						
Urban	30.2	2,160	71.2	46.6	17.4	653
Rural	46.3	4,203	64.4	31.6	11.0	1,947
Zone						
North Central	29.9	1,181	76.8	43.1	15.6	353
North East	48.0	904	69.1	37.2	11.3	434
North West	52.1	2,053	59.5	31.4	9.5	1,070
South East	38.3	564	75.9	44.1	11.0	216
South South	42.9	700	66.1	26.2	10.9	300
South West	23.5	962	65.2	42.5	29.1	226
Mother's education[2]						
No education	47.6	2,603	64.8	32.6	10.4	1,239
Primary	40.3	979	65.6	35.4	12.6	395
Secondary	35.1	1,651	68.6	40.0	15.9	579
More than secondary	27.0	426	76.7	48.8	21.7	115
Wealth quintile						
Lowest	51.0	1,323	57.5	22.3	8.8	675
Second	48.5	1,465	67.7	36.9	11.3	711
Middle	41.7	1,173	69.6	40.3	13.6	490
Fourth	34.4	1,182	67.8	39.5	12.6	406
Highest	26.0	1,220	73.3	47.0	22.0	318
Total	40.9	6,364	66.1	35.4	12.6	2,600

Note: Estimates for the North East Zone do not include rural areas of Borno State.
[1] Excludes advice or treatment from a traditional practitioner
[2] Excludes children whose mothers were not interviewed

Prompt management of fever is one indicator used to measure the quality of case management. Advice or treatment was sought for 66 percent of children under age 5 who had a fever in the 2 weeks preceding the interview. Treatment was sought the same day of fever onset or the next day for 35 percent of children, and 13 percent had blood taken from a finger or heel for testing. The proportion of children for whom advice or treatment was sought was highest among those age 12-23 months (70 percent) and lowest among those less than age 12 months (62 percent). The proportion of children who had blood taken was highest in the South West Zone (29 percent). The likelihood of seeking advice or treatment and obtaining a blood sample for testing increases with an increase mother's education and wealth.

Figure 4.6 presents data on trends in malaria diagnosis and treatment among children with fever from the 2010 NMIS, 2013 NDHS, and 2015 NMIS. Data for some of the malaria indicators described in this section were calculated differently in 2010 and 2013, and the figures presented may differ from those reported in the printed final reports of the respective surveys. For the purpose of observing trends over time, data presented here from the 2010 NMIS and the 2013 NDHS were calculated according to the methodology used in the 2015 NMIS to reflect the updated malaria indicators.

Figure 4.6 **Trends in diagnosis and treatment of children with fever**



The proportion of children under age 5 who had a fever in the 2 weeks before the survey is higher in the 2015 NMIS (41 percent) than in the 2013 NDHS (13 percent) and the 2010 NMIS (35 percent). The difference may be due to variation in the months of data collection or random variations in rainfall and malaria transmission from year to year. A downward trend is observed in health-seeking behaviours for children with fever between 2010 and 2015. However, a higher proportion of children with fever in the 2 weeks prior to the interview had their blood tested in 2015 than in 2010 (13 percent versus 5 percent). There has been a large increase in the percentage of children taking ACT, from 12 percent in 2010 to 18 percent in 2013 and 38 percent in 2015.

Table 4.9 presents data on the various sources of advice or treatment for children reported to have had a fever in the 2 weeks before the interview. The majority of children received advice or treatment from the private sector (66 percent), while 30 percent consulted a public sector source and 5 percent relied on other sources such as shops, traditional practitioners, and drug hawkers. Among 51

Table 4.9 Source of advice or treatment for children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought from specific sources, Nigeria 2015

Source	Among children with fever for whom advice or treatment was sought
Any public sector source	30.4
Government hospital	9.7
Government health centre	15.6
Government health post	3.5
Free mobile clinic	0.6
Role model caregiver/CHW	1.2
Any private sector source	66.2
Private hospital/clinic	6.9
Pharmacy	6.1
Chemist/PMV	51.1
Private doctor	1.5
Mobile clinic	0.7
Other private sector	0.1
Any other source	4.5
Shop	1.5
Traditional practitioner	1.8
Drug hawker	0.5
Other	0.7
Number of children	1,770

Note: Total does not include rural areas of Borno State.
CHW = Community health worker
PMV = Patent medicine vendors

percent of children, advice or treatment was sought from a private sector chemist or patent medicine vendor (PMV). Within the public sector, advice or treatment was sought mainly from a government health centre (16 percent) or a government hospital (10 percent).

Table 4.10 presents data on the types of antimalarial medications given to children to treat fever, by background characteristics. Thirty-eight percent of children received an ACT medication, 29 percent took chloroquine, 14 percent took an SP medication, 10 percent received artesunate (administered via injection, intravenously, or via rectal suppository), 6 percent received quinine (administered via pills, via injection, or intravenously), and 6 percent took amodiaquine. Ten percent of children received some other type of antimalarial medication.

Table 4.10 Type of antimalarial drugs used

Among children under age 5 with fever in the 2 weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial drugs, by background characteristics, Nigeria 2015

Background characteristic	Percentage of children who took drug:									Number of children with fever who took anti-malarial drug
	Any ACT	SP	Chloro-quine	Amodia-quine	Quinine pills	Quinine injection/IV	Artesunate rectal	Artesunate injection/IV	Other anti-malarial	
Age (months)										
<6	(29.7)	(21.8)	(44.1)	(6.2)	(0.0)	(1.9)	(3.9)	(1.6)	(6.0)	40
6-11	39.6	13.1	29.1	4.3	4.5	1.1	5.0	4.1	7.4	90
12-23	37.1	12.4	31.0	7.0	2.4	4.2	3.7	4.2	10.4	230
24-35	31.6	13.5	28.7	6.8	4.3	2.3	6.3	6.7	10.6	247
36-47	44.9	12.0	28.8	5.7	2.5	3.9	3.4	6.4	6.3	247
48-59	37.3	15.2	23.9	5.7	5.1	1.9	4.8	5.9	12.1	216
Sex										
Male	37.1	12.7	29.3	6.8	3.5	3.1	5.7	6.1	8.4	560
Female	38.1	14.5	28.4	5.4	3.6	2.7	3.3	4.9	10.7	510
Residence										
Urban	41.7	15.2	20.3	9.4	4.2	2.1	6.2	4.9	10.9	343
Rural	35.7	12.7	32.9	4.6	3.2	3.2	3.8	5.9	8.8	727
Zone										
North Central	45.0	12.0	23.4	8.5	5.1	2.5	2.4	0.4	8.7	119
North East	30.8	21.4	30.2	3.3	4.3	3.5	5.2	5.2	11.0	206
North West	35.6	15.4	40.2	4.1	0.9	4.4	2.7	6.1	5.5	401
South East	47.3	4.9	16.0	4.2	3.9	1.8	8.5	7.3	10.3	102
South South	42.2	6.1	17.6	5.4	4.5	0.0	6.1	7.7	17.5	130
South West	35.1	10.5	16.7	18.9	8.2	1.2	7.1	5.3	11.5	113
Mother's education[1]										
No education	32.9	17.8	36.3	4.6	3.4	4.2	2.6	5.0	7.8	464
Primary	34.7	12.8	33.3	7.6	3.1	0.3	5.1	4.4	9.2	211
Secondary	42.8	9.7	18.0	7.2	4.0	2.3	7.2	6.5	11.8	311
More than secondary	51.9	6.0	16.6	7.0	3.3	4.5	4.3	7.6	11.0	83
Wealth quintile										
Lowest	34.8	15.6	36.6	2.4	2.0	5.5	3.7	6.1	7.7	224
Second	34.8	16.0	34.6	5.6	3.7	3.0	2.8	4.1	6.8	281
Middle	40.6	11.7	30.5	4.3	5.0	0.8	2.2	2.8	10.2	186
Fourth	34.2	12.9	24.7	9.7	2.5	2.8	7.2	11.0	11.1	197
Highest	45.9	9.8	13.2	9.6	4.6	1.8	7.9	3.8	13.2	182
Total	37.6	13.5	28.9	6.1	3.5	2.9	4.6	5.5	9.5	1,070

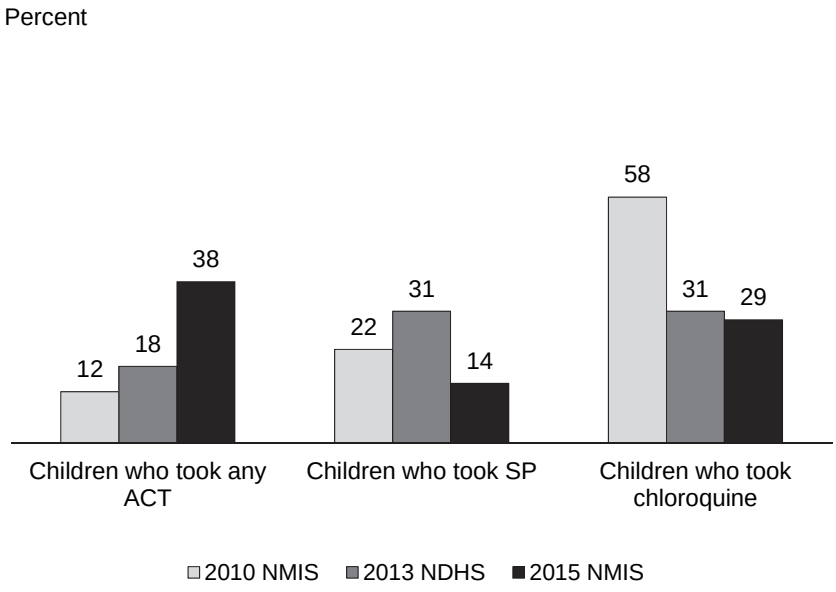
Notes: Figures in parentheses are based on 25-49 unweighted cases. Estimates for the North East Zone do not include rural areas of Borno State.
[1] Excludes children whose mothers were not interviewed

Children age 36-47 months are most likely to have received an ACT (45 percent), followed by children age 6-11 months. Female and male children are equally likely to have received an ACT medication. Forty-two percent of children in urban areas received an ACT medication, as compared with 36 percent of their counterparts in rural areas. By zone, children in South East (47 percent) and North Central (45 percent) are more likely to have received ACT than children in other zones. Mother's education is positively associated with the likelihood of children receiving an ACT medication. One-third of children whose mothers have no education received

ACTs (33 percent), compared with more than half of children whose mothers have completed education beyond the secondary level (52 percent). There is no clear pattern by wealth, although children from households in the highest wealth quintile are more likely to have received an ACT medication (46 percent) than other children.

Figure 4.7 presents trends in the types of antimalarial drugs taken by children. There has been a steady increase over time in the percentage of children with a fever within the 2 weeks of the interview who were treated with an ACT medication, from 12 percent in 2010 to 18 percent in 2013 and 38 percent in 2015. The results also show evidence of greater adherence to the national guideline for treating children with malaria with ACT rather than a SP medication or chloroquine. In 2010, 58 percent of children with fever who received an antimalarial were treated with chloroquine. This percentage declined to 31 percent in 2013 and 29 percent in 2015. The use of SP for treating malaria in children declined from 31 percent in 2013 to 14 percent in 2015.

Figure 4.7 **Trends in type of antimalarial taken among children with fever who received antimalarial medication**



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 November 2013, the government of Nigeria, with support from several partners, distributed approximately 52 million mosquito nets across the country. During replacement campaigns, 46 million nets were distributed from December 2013 through March 2015. In addition, programme efforts to fight malaria have emphasised increasing public awareness of the importance of net usage, which has led to a greater demand for the mosquito nets.

5.1.2 Ownership of Mosquito Nets

The 2015 NMIS included questions on mosquito net ownership and use, type of net and source, net preference, and reasons for not using a net. In addition, questions were asked to determine who had slept inside each net the previous night, and why a net was not used for those nets no one slept under the night before the interview.

Tables 5.1.1 and 5.1.2 present information on the percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household the previous night, by background characteristics and by state. Figure 5.1 presents differentials in ITN household ownership for the background characteristics.

Overall, 71 percent of households have at least one mosquito net, 69 percent have at least one ITN, and 69 percent have at least one LLIN. Almost all ITNs owned by households in Nigeria are LLINs. The average number of any nets per household is two, and the average number of ITNs and LLINs per household is two. Thirty-six percent of households have at least one net for every two persons in the household, and 35 percent of households have an ITN or LLIN for the same indicator.

Household ownership of at least one ITN varies widely by background characteristics. Household ITN and LLIN ownership is notably higher among rural households (73 percent each) than among urban households (63 percent each). Among zones, ITN household ownership ranges from 53 percent of households in South West to 91 percent of households in North West. Similarly, the average number of ITNs owned by households is 2 in North West, North East, and South South. Ownership of at least one ITN decreases with increasing wealth. The majority of the households in the lowest wealth quintile (86 percent) own at least one ITN compared with 58 percent of households in the highest wealth quintile.

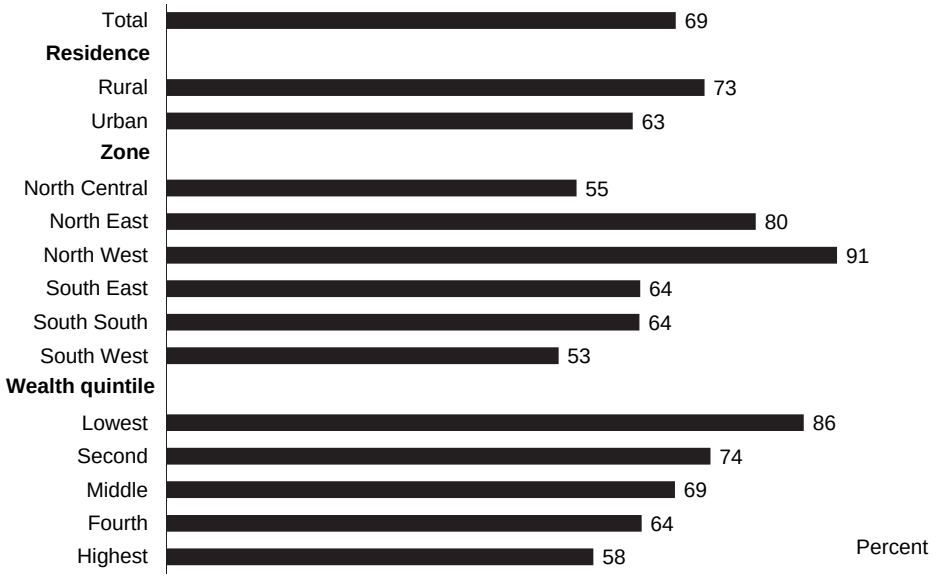
Table 5.1.1 Household possession of mosquito nets: National

Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, by background characteristics, Nigeria 2015

Background characteristic	Percentage of households with at least one mosquito net			Average number of nets per household			Number of households	Percentage of households with at least one net for every two persons who stayed in the household last night[1]			Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	
Residence											
Urban	65.7	63.0	62.8	1.4	1.4	1.4	3,083	31.5	29.9	29.9	3,071
Rural	74.7	72.7	72.6	1.8	1.8	1.8	4,662	39.6	38.1	38.0	4,657
Zone											
North Central	56.9	55.4	55.2	1.2	1.2	1.2	1,311	25.8	24.8	24.7	1,310
North East	80.1	79.6	79.6	2.1	2.1	2.1	843	38.0	36.9	36.9	842
North West	91.3	90.6	90.6	2.4	2.3	2.3	1,993	45.5	44.8	44.8	1,989
South East	69.9	64.0	63.3	1.6	1.4	1.4	876	40.0	36.4	36.2	874
South South	66.3	63.9	63.5	1.6	1.5	1.5	1,154	42.1	40.1	39.8	1,150
South West	56.6	53.0	53.0	1.0	1.0	1.0	1,567	26.7	24.9	24.9	1,561
Wealth quintile											
Lowest	87.2	86.1	86.1	2.3	2.3	2.3	1,237	43.4	42.3	42.3	1,237
Second	74.0	73.5	73.4	1.8	1.8	1.8	1,423	37.0	36.2	36.2	1,423
Middle	70.5	68.7	68.6	1.7	1.6	1.6	1,616	38.5	37.0	37.0	1,612
Fourth	67.5	64.2	64.0	1.6	1.5	1.5	1,684	36.5	34.6	34.5	1,680
Highest	61.6	57.7	57.4	1.2	1.2	1.2	1,784	29.0	26.9	26.7	1,776
Total	71.1	68.8	68.7	1.7	1.6	1.6	7,745	36.4	34.9	34.8	7,727

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] De facto household members
[2] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months.

Figure 5.1 Differentials in household ownership of ITNs



NMIS 2015

Table 5.1.2 and Figure 5.2 show household ownership of any mosquito net is lowest in Kwara State (39 percent) and highest in Bauchi State (99 percent); ownership of ITNs is lowest in Kwara State (38 percent) and highest in Bauchi State and Katsina State (97 percent each). Similar to what is observed with ITNs, LLIN ownership is lowest in Kwara State and Edo State (38 percent each) and highest in Bauchi State and Katsina State (97 percent).

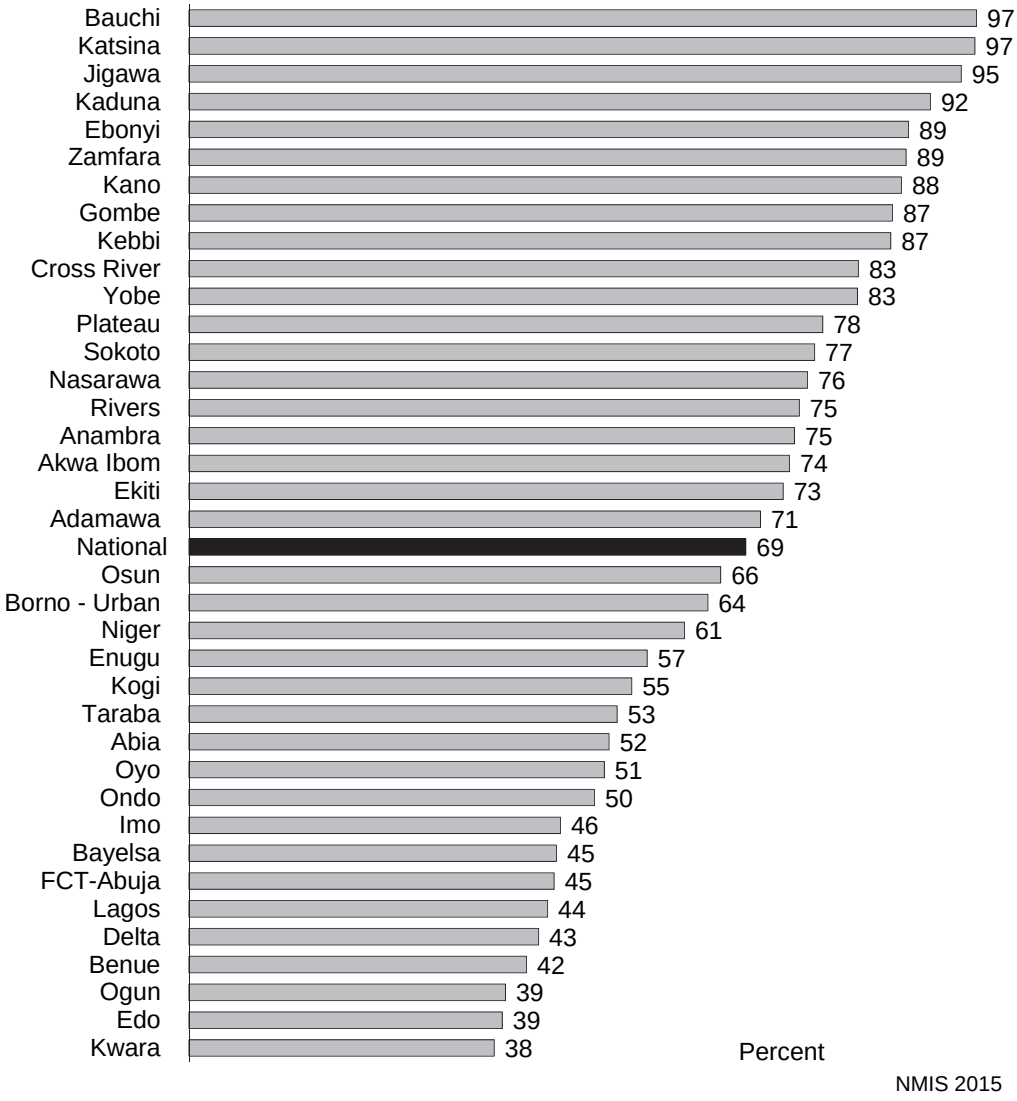
Table 5.1.2 Household possession of mosquito nets: States

Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, by state, Nigeria 2015

State	Percentage of households with at least one mosquito net			Average number of nets per household			Number of households	Percentage of households with at least one net for every two persons who stayed in the household last night[1]			Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	
North Central											
FCT-Abuja	48.5	45.1	42.2	1.0	0.9	0.9	41	28.0	23.4	22.9	41
Benue	42.6	41.7	41.7	0.8	0.8	0.8	313	16.3	15.6	15.6	313
Kogi	59.1	54.7	54.7	1.1	1.0	1.0	174	22.0	20.2	19.8	174
Kwara	39.2	37.7	37.7	0.7	0.7	0.7	195	15.1	13.6	13.6	195
Nasarawa	77.6	76.4	76.4	2.1	2.0	2.0	92	33.3	33.0	33.0	92
Niger	62.1	61.2	60.8	1.3	1.3	1.3	293	36.9	36.3	36.3	293
Plateau	78.9	78.3	78.3	1.9	1.9	1.9	202	34.2	33.6	33.6	202
North East											
Adamawa	70.6	70.6	70.6	1.6	1.6	1.6	150	31.1	31.1	31.1	150
Bauchi	98.6	97.3	97.3	2.8	2.7	2.7	235	56.3	53.0	53.0	235
Borno - Urban	64.1	64.1	64.1	1.2	1.2	1.2	48	11.3	11.3	11.3	47
Gombe	87.2	86.9	86.9	2.5	2.4	2.4	122	38.7	37.7	37.7	122
Taraba	53.6	52.9	52.9	1.0	0.9	0.9	128	17.1	16.5	16.5	128
Yobe	82.6	82.6	82.6	2.3	2.3	2.3	161	41.8	41.8	41.8	161
North West											
Jigawa	95.4	95.4	95.4	2.8	2.8	2.8	301	55.9	55.7	55.7	301
Kaduna	92.8	91.6	91.6	2.6	2.6	2.6	274	55.0	52.9	52.9	274
Kano	89.0	88.0	88.0	2.1	2.1	2.1	423	40.7	40.2	40.2	423
Katsina	97.6	97.1	97.1	2.8	2.8	2.8	409	54.2	53.7	53.7	405
Kebbi	86.7	86.7	86.7	1.6	1.6	1.6	200	22.1	22.1	22.1	200
Sokoto	77.8	77.3	77.3	1.3	1.3	1.3	157	24.0	24.0	24.0	157
Zamfara	90.1	88.6	88.6	2.7	2.6	2.6	229	49.1	47.3	47.3	229
South East											
Abia	66.5	51.9	50.6	1.3	1.0	1.0	134	37.5	29.9	28.9	132
Anambra	74.8	74.8	73.5	1.7	1.7	1.7	234	49.8	47.9	47.9	234
Ebonyi	89.5	88.9	88.4	2.8	2.7	2.7	151	64.2	62.7	62.7	151
Enugu	56.6	56.6	56.6	0.9	0.9	0.9	165	19.8	19.8	19.8	165
Imo	62.5	45.9	45.9	1.2	0.8	0.8	192	28.1	20.4	20.4	192
South South											
Akwa Ibom	75.5	74.2	74.2	2.2	2.2	2.2	204	55.6	54.8	54.8	203
Bayelsa	51.0	45.4	45.4	1.1	1.0	1.0	120	26.0	22.7	22.7	120
Cross River	86.0	82.7	80.6	2.0	1.9	1.8	180	58.8	55.2	54.7	179
Delta	49.6	43.2	43.2	1.0	0.9	0.9	160	28.6	24.3	24.3	160
Edo	39.7	38.7	38.3	0.8	0.7	0.7	153	19.7	18.3	17.9	153
Rivers	75.8	75.4	75.4	1.8	1.8	1.8	337	47.3	46.8	46.3	335
South West											
Ekiti	73.4	73.4	73.4	1.5	1.5	1.5	138	50.7	50.2	50.2	137
Lagos	52.8	44.3	44.3	0.8	0.7	0.7	314	13.5	11.8	11.8	312
Ogun	50.5	39.1	39.1	0.9	0.7	0.7	172	25.0	19.2	19.2	169
Ondo	50.1	50.1	50.1	0.7	0.7	0.7	248	25.7	25.7	25.7	248
Osun	66.1	65.7	65.7	1.3	1.3	1.3	300	38.6	38.1	38.1	299
Oyo	53.4	51.3	51.3	1.1	1.0	1.0	396	21.2	18.6	18.6	396
Total	71.1	68.8	68.7	1.7	1.6	1.6	7,745	36.4	34.9	34.8	7,727

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] De facto household members
[2] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a pre-treated net obtained within the past 12 months.

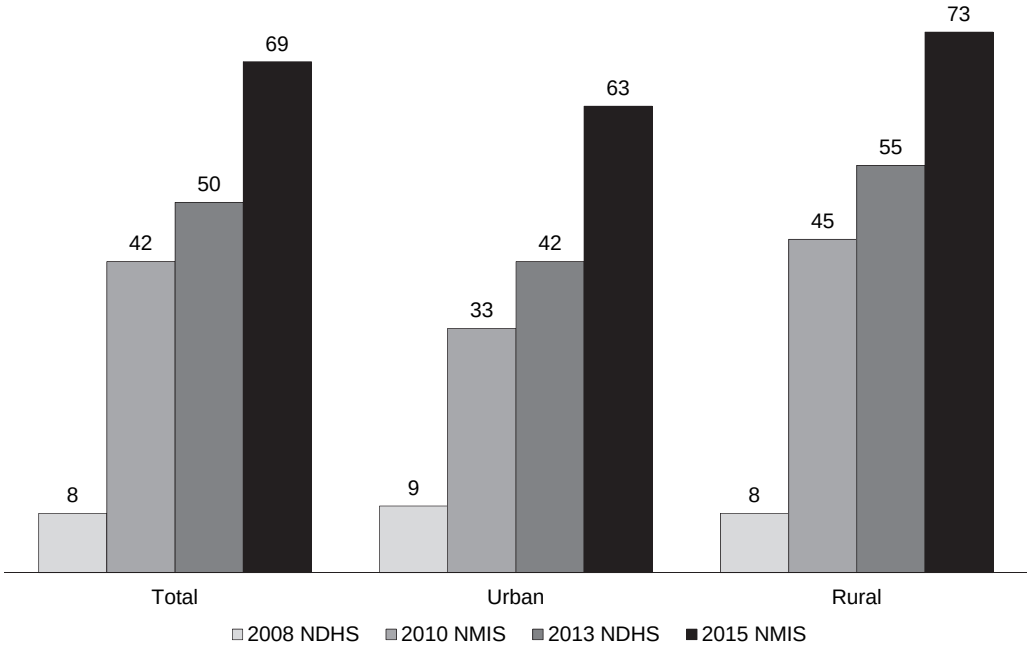
Figure 5.2 **Percentage of households with at least one ITN, by state**



The average number of any mosquito nets per household is between one and two nets for households in most states, except in Bauchi, Ebonyi, Jigawa, and Katsina states where the average number of nets per household is almost three nets. Similar patterns are observed among the states in the data for the average number of ITNs and LLINs per household. The percentage of households with at least one ITN for every two persons who stayed in the household the previous night is lowest in Borno-urban (11 percent), Lagos State (12 percent), and Kwara State (14 percent) and highest in Ebonyi State (63 percent).

Figure 5.3 shows trend data for ITN ownership from the 2008 NDHS, 2010 NMIS, and 2013 NDHS surveys. In 2008, only 8 percent of households owned at least one ITN. Household ITN ownership has substantially increased during the last 7 years to 42 percent in 2010, to 50 percent in 2013, and 69 percent in 2015. This sharp increase in household net ownership can be attributed to the LLIN mass distribution campaign supported by the Global Fund, World Bank, UK Department for International Development (DFID), Support for the National Malaria Control Programme (SuNMaP), President's Malaria Initiative (PMI)/USAID, and MDG funds through the government of Nigeria.

Figure 5.3 **Trends Percentage of households with at least one ITN, by residence**



5.1.3 Access to Insecticide-Treated Nets (ITNs)

The access indicator for ITNs indicates typical net usage, and is a key indicator of the effectiveness of the malaria programme in Nigeria. Table 5.2 shows the percent distribution of the de facto household population (individuals listed in the household schedule, including usual members and visitors who slept in the household the night before the interview) by the number of ITNs the household owns, and the percentage with access to an ITN, according to the number of persons who stayed in the household the night before the survey.

Nationally, 55 percent of the de facto population who stayed in the household a night before the survey could sleep inside an ITN if each net were used by at most two people. Access to an ITN varies according to the number of people who stayed in the household the night before the survey. Less than half of the household population (46 percent) in which one person stayed in the household the night before the survey has access to an ITN. The majority of these one-person households do not have an ITN (55 percent). However, 64 percent of the household population in which two people stay in the household the night before the survey have access to an ITN. In these households, 35 percent have one ITN, 21 percent have two ITNs, and 5 percent have three ITNs. The data show that households with more people who stayed in the household the night before the survey have higher ITN ownership.

Table 5.2 Access to an insecticide-treated net (ITN)

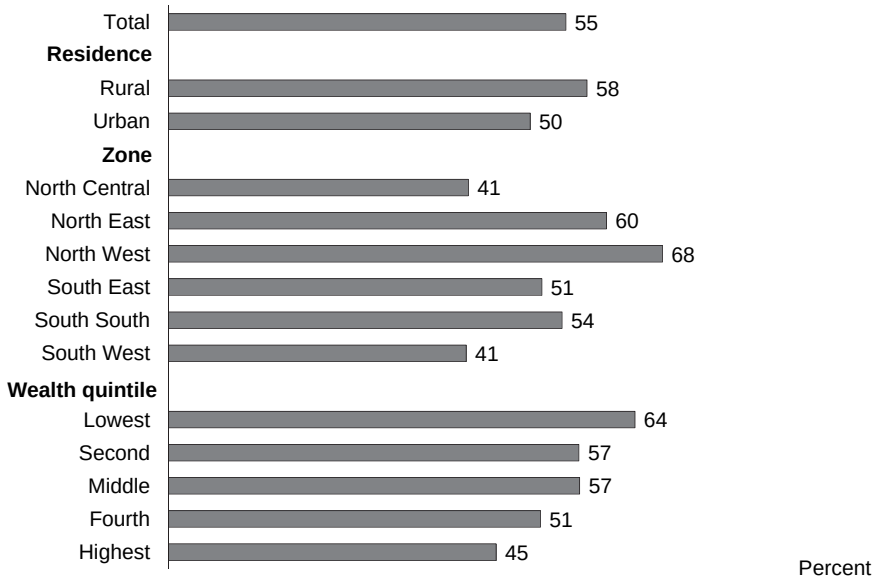
Percent distribution of the de facto household population by number of ITNs the household owns, and percentage with access to an ITN, according to number of persons who stayed in the household the night before the survey, Nigeria 2015

	Number of persons who stayed in the household the night before the survey								
Number of ITNs[1]	1	2	3	4	5	6	7	8+	Total
0	54.5	36.1	33.6	29.7	29.3	26.7	25.3	16.1	25.4
1	32.2	34.9	29.9	23.1	18.0	15.6	11.8	7.1	16.1
2	10.0	20.6	24.6	31.7	31.3	28.9	28.0	18.5	24.7
3	1.8	4.9	7.3	10.4	12.5	15.2	16.7	17.9	13.9
4	0.8	1.8	3.2	3.3	4.9	8.9	11.4	16.2	9.4
5	0.4	0.4	0.8	1.0	2.0	3.4	3.7	8.5	4.2
6	0.2	0.6	0.4	0.2	1.3	0.7	1.8	8.4	3.4
7+	0.1	0.6	0.3	0.5	0.7	0.7	1.3	7.2	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	902	1,741	3,315	4,312	5,447	5,040	4,163	12,756	37,674
Percent with access to an ITN[2]	45.5	63.9	56.4	58.8	53.6	53.3	51.9	54.3	54.7

Note: The total does not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a pre-treated net obtained within the past 12 months.
[2] Percentage of the de facto household population who could sleep inside an ITN if each ITN in the household were used by up to two people

Figure 5.4 shows data for the percentage of the de facto household population who could sleep inside an ITN if each ITN in the household were used by up to two people, by residence, zone and wealth quintile.

Figure 5.4 **Percentage of the de facto population with access to an ITN in the household, by background characteristics, Nigeria 2015**



Note: Percentage of the de facto household population who could sleep inside an ITN if each ITN in the household were used by up to two people

NMIS 2015

5.1.4 Source of Mosquito Nets

During the survey, several questions asked specifically about each mosquito net the household owned. For each mosquito net, the respondent for the Household Questionnaire was asked where the net was obtained. There are several ways to procure a mosquito net in Nigeria. A pregnant woman may receive one during a routine

antenatal care visit. Parents of children under age 5 may receive a net during a routine immunisation visit to a health facility. Mosquito nets can also be obtained free of charge during mass distribution campaigns through religious institutions, community-directed distributors (CDD); and they can be purchased directly through various avenues. The percent distribution of nets by source, according to background characteristics, is shown in Tables 5.3.1 for national data and 5.3.2 for state data.

The majority of the 12,938 mosquito nets found in households were obtained through mass net distribution campaigns (77 percent). Other sources of nets in Nigeria include immunisation visits (7 percent); shops, supermarkets, open markets, or hawkers (6 percent); and antenatal visits (5 percent). At the zonal level, there is not much variation in the net source. Survey findings show that 68 percent of mosquito nets in North East were obtained through a net distribution campaign compared with 82 percent of nets in North West. One in five households in North East (20 percent) report that they obtained mosquito nets from a shop, supermarket, open market, or hawker; households in this zone rely on this source more than any other zone.

The percentage of nets obtained from ANC visits increases with wealth. Three percent of nets in households in the lowest wealth quintile were received from an ANC visit compared with 7 percent of nets in households in the highest wealth quintile. The pattern reverses when observing the source of net data from immunisations visits. Eight percent of nets among households in the lowest wealth quintile received a net from an immunisation visit compared with 5 percent among households in the highest wealth quintile.

Table 5.3.1 Source of nets: National

Percent distribution of mosquito nets by source of the net, according to background characteristics, Nigeria 2015

Background characteristic	Cam-paign	Antenatal care visit	Immuni-sation visit	Govern-ment health facility	Non-govern-mental health facility[1]	Religious institution	Phar-macy/ medicine store	Shop/ super-market/ open market/ hawker	School	Com-munity directed distributor (CDD)	Other	Don't know/ missing	Total	Number of mosquito nets
Residence														
Urban	74.4	5.4	5.2	1.9	0.2	0.1	0.7	8.9	0.2	0.8	1.9	0.2	100.0	4,376
Rural	77.7	4.3	7.7	2.4	0.1	0.4	0.2	5.0	0.1	1.1	0.9	0.1	100.0	8,563
Zone														
North Central	75.8	10.8	2.9	0.5	0.4	0.0	0.3	7.7	0.2	0.2	1.0	0.1	100.0	1,594
North East	68.0	4.1	6.2	0.1	0.2	0.0	0.5	20.2	0.1	0.1	0.3	0.1	100.0	1,754
North West	81.9	2.1	9.2	1.1	0.0	0.0	0.0	4.5	0.0	0.4	0.8	0.0	100.0	4,744
South East	80.5	4.8	7.0	1.2	0.1	0.3	0.0	1.9	0.2	1.7	2.2	0.0	100.0	1,382
South South	69.7	3.1	6.2	9.8	0.1	1.3	0.3	2.2	0.6	4.2	2.1	0.4	100.0	1,852
South West	75.6	8.5	5.1	1.9	0.2	0.5	1.3	4.2	0.2	0.2	2.0	0.2	100.0	1,613
Wealth quintile														
Lowest	81.4	2.6	8.3	0.4	0.0	0.0	0.3	6.3	0.0	0.2	0.6	0.0	100.0	2,795
Second	80.6	3.6	7.1	1.0	0.0	0.7	0.2	5.8	0.0	0.7	0.3	0.0	100.0	2,577
Middle	77.2	5.1	6.8	2.5	0.1	0.5	0.4	6.1	0.0	0.5	0.9	0.0	100.0	2,686
Fourth	73.1	5.3	6.6	4.3	0.3	0.0	0.4	5.3	0.3	2.4	1.9	0.2	100.0	2,679
Highest	69.3	7.3	5.3	3.2	0.3	0.3	0.5	8.7	0.5	1.3	2.8	0.4	100.0	2,201
Total	76.6	4.7	6.9	2.2	0.1	0.3	0.3	6.4	0.2	1.0	1.2	0.1	100.0	12,938

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] Includes nongovernmental organisations (NGOs), private hospitals, and mission clinics

Net distribution campaigns are the main source of mosquito nets among all the states in Nigeria except Borno and Yobe where the main source is a shop, supermarket, open market, or hawker (65 percent and 52 percent, respectively). Obtaining nets from a net distribution campaign is highest is Ekiti State (98 percent) and lowest in Yobe State (36 percent) and Borno-urban State ((31 percent).

Table 5.3.2 Source of nets: States

Percent distribution of mosquito nets by source of the net, according to state, Nigeria 2015

State	Cam-paign	Antenatal care visit	Immuni-sation visit	Govern-ment health facility	Non-govern-mental health facility[1]	Reli-gious institu-tion	Phar-macy/ medicine store	Shop/ super-market/ open market/ hawker	School	Com-munity directed distributor (CDD)	Other	Don't know/ missing	Total	Number of mosquito nets
North Central														
FCT-Abuja	49.1	7.5	1.6	3.1	1.3	0.5	3.1	23.7	4.4	0.0	1.0	4.8	100.0	43
Benue	86.0	6.3	2.2	0.8	0.0	0.0	0.3	4.3	0.0	0.0	0.1	0.0	100.0	249
Kogi	69.5	7.4	6.1	0.0	2.9	0.0	0.4	10.3	0.0	1.4	2.1	0.0	100.0	196
Kwara	70.6	1.6	9.7	0.0	0.0	0.0	1.6	12.9	0.0	0.7	2.9	0.0	100.0	134
Nasarawa	81.1	7.8	3.3	1.2	0.0	0.0	0.3	5.8	0.0	0.0	0.5	0.0	100.0	190
Niger	66.7	21.1	0.7	0.0	0.0	0.0	0.0	10.3	0.3	0.0	0.9	0.0	100.0	391
Plateau	83.8	10.1	1.7	0.6	0.0	0.0	0.0	3.2	0.0	0.0	0.6	0.0	100.0	392
North East														
Adamawa	49.5	2.9	15.8	0.3	0.6	0.2	0.0	30.0	0.0	0.0	0.7	0.0	100.0	247
Bauchi	88.1	1.0	4.2	0.0	0.1	0.0	1.4	4.9	0.0	0.0	0.1	0.2	100.0	655
Borno - Urban	30.6	0.0	4.8	0.0	0.0	0.0	0.0	64.7	0.0	0.0	0.0	0.0	100.0	58
Gombe	85.4	12.1	0.5	0.0	0.0	0.0	0.0	0.6	0.6	0.4	0.2	0.2	100.0	302
Taraba	65.2	12.8	3.8	0.7	0.8	0.0	0.6	14.1	0.3	0.0	1.7	0.0	100.0	122
Yobe	37.5	1.3	9.2	0.0	0.0	0.0	0.0	51.7	0.0	0.0	0.3	0.0	100.0	370
North West														
Jigawa	66.5	1.8	31.2	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	100.0	840
Kaduna	87.1	1.4	7.2	1.0	0.0	0.0	0.0	2.5	0.0	0.0	0.9	0.0	100.0	720
Kano	82.1	1.9	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	2.6	0.0	100.0	885
Katsina	94.7	2.9	0.8	0.1	0.0	0.0	0.0	1.4	0.0	0.0	0.1	0.0	100.0	1,157
Kebbi	58.5	1.8	20.7	12.8	0.0	0.0	0.0	4.7	0.0	0.0	1.4	0.0	100.0	325
Sokoto	57.6	5.4	23.1	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.4	0.0	100.0	201
Zamfara	92.7	1.5	0.2	0.0	0.0	0.0	0.0	2.2	0.0	3.3	0.0	0.1	100.0	616
South East														
Abia	49.3	13.2	31.8	1.0	0.7	0.0	0.0	1.2	0.2	1.0	1.5	0.0	100.0	175
Anambra	91.1	2.5	0.6	0.0	0.0	0.7	0.0	3.9	0.0	0.4	0.7	0.0	100.0	408
Ebonyi	93.9	2.3	1.4	0.2	0.0	0.3	0.0	1.1	0.0	0.5	0.3	0.0	100.0	421
Enugu	77.1	12.7	9.6	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	100.0	149
Imo	62.9	2.0	8.1	6.3	0.0	0.0	0.0	1.1	1.0	8.1	10.5	0.0	100.0	229
South South														
Akwa Ibom	66.7	0.6	0.8	21.8	0.0	0.0	0.1	1.1	0.0	5.1	3.0	0.8	100.0	453
Bayelsa	65.3	5.4	15.9	0.4	0.0	0.0	0.0	8.9	4.1	0.0	0.0	0.0	100.0	135
Cross River	88.6	3.9	7.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	362
Delta	57.6	7.8	2.4	18.2	0.3	0.5	0.5	5.4	0.0	0.0	7.2	0.0	100.0	162
Edo	63.2	8.2	15.4	0.6	0.6	0.0	4.5	4.7	0.0	0.0	2.9	0.0	100.0	117
Rivers	66.4	1.7	6.8	8.3	0.2	3.6	0.0	1.4	0.8	8.6	1.6	0.5	100.0	623
South West														
Ekiti	97.8	1.2	0.4	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	100.0	205
Lagos	62.1	14.5	7.4	0.0	1.3	0.0	0.0	7.6	0.0	0.0	7.1	0.0	100.0	255
Ogun	46.7	12.9	8.8	17.6	0.0	0.4	0.9	5.8	0.0	2.4	3.8	0.6	100.0	163
Ondo	86.5	4.5	2.0	0.0	0.0	0.0	2.3	4.6	0.0	0.0	0.0	0.0	100.0	176
Osun	88.9	2.5	2.0	0.0	0.0	0.4	2.0	1.9	0.0	0.0	2.0	0.4	100.0	379
Oyo	67.9	13.6	8.8	0.5	0.0	1.5	1.9	5.1	0.8	0.0	0.0	0.0	100.0	434
Total	76.6	4.7	6.9	2.2	0.1	0.3	0.3	6.4	0.2	1.0	1.2	0.1	100.0	12,938

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] Includes nongovernmental organisations (NGOs), private hospitals, and mission clinics

5.2 INDOOR RESIDUAL SPRAYING

The Federal Ministry of Health has included indoor residual spraying (IRS) as one of the preventive strategies against malaria in Nigeria. Interior walls and ceilings of houses are sprayed with a chemical that has a long-lasting effect against mosquitoes. The IRS implementation programme in the country is relatively new and is not deployed in all states of the federation. In the 2015 NMIS, information was collected on households sprayed with IRS in the 12 months before the survey.

Table 5.4 shows that, nationally, 1 percent of the households report that they have had IRS in the 12 months before the survey. There are no major variations by background characteristics, mainly because of the small number of households sprayed in the past year.

Sixty-nine percent of households surveyed in the 2015 NMIS have at least one ITN and/or have had IRS in the last 12 months. This percentage is higher among rural (73 percent) than urban households (63 percent). Survey findings also show zonal variations where the percentage of households with at least one ITN and/or IRS in the preceding 12 months is lowest in South West (53 percent) and highest in North West (91 percent). Fifty-eight percent of households in the highest wealth quintile have at least one ITN and/or had IRS in the past 12 months, compared with 86 percent of the households in the lowest wealth quintile.

Thirty-six percent of households have at least one ITN for every 2 persons and/or IRS in the past 12 months. Zonal variation ranges from 25 to 45 percent.

Table 5.4 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, the percentage of households with at least one ITN and/or IRS in the past 12 months, and the percentage of households with at least one ITN for every two persons and/or IRS in the past 12 months, by background characteristics, Nigeria 2015

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	Percentage of households with at least one ITN[2] for every two persons and/or IRS in the past 12 months	Number of households
Residence				
Urban	2.0	63.2	30.8	3,083
Rural	0.8	72.9	38.6	4,662
Zone				
North Central	0.8	55.5	25.3	1,311
North East	2.5	80.1	38.4	843
North West	0.8	90.7	45.2	1,993
South East	2.6	64.1	37.2	876
South South	1.0	64.2	40.5	1,154
South West	0.9	53.2	25.4	1,567
Wealth quintile				
Lowest	0.6	86.2	42.7	1,237
Second	0.5	73.7	36.7	1,423
Middle	1.3	68.8	37.5	1,616
Fourth	1.8	64.4	35.2	1,684
Highest	1.8	58.0	27.8	1,784
Total	1.3	69.0	35.5	7,745

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organisation.
[2] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN) or (2) a net that has been soaked with insecticide within the past 12 months.

Table 5.5 shows that among all the households surveyed, only 114 reported that the interior walls of their household dwelling were treated with IRS. The majority of these households (72 percent) received IRS from a government worker or government programme; 10 percent received IRS from a private company, and 4 percent from an NGO. Eight percent of households did not recall what organisation implemented IRS in their dwellings.

Table 5.5 Source of indoor residual spraying by organisation

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 organisations, Nigeria 2015

Organisation which implemented IRS in dwelling	Percent distribution of sources of IRS	Number of households sprayed in past 12 months
Government worker or programme	71.5	82
Private company	9.9	11
Non-governmental organisation (NGO)	3.6	4
Other	7.0	8
Don't know/missing	8.0	9
Total	100.0	114

5.3 USE OF MOSQUITO NETS

5.3.1 Use of Mosquito Nets among the De Facto Household Population

The 2015 NMIS collected information in sampled households on the use of mosquito nets among household members and visitors. Information was collected about each net separately, including whether the net was used or not used the night before the interview. For the nets that were used, a list of individuals who slept under each net was recorded. Table 5.6.1 shows the percentages, by background characteristics, of the de facto household population that slept the night before the survey either inside a mosquito net, an ITN, or an LLIN, or inside an ITN within a dwelling that underwent IRS in the past 12 months. Also presented by background characteristics in households with at least one ITN are the percentages of the de facto household population that slept inside the net the night before the survey.

Overall, 38 percent of the household population slept inside any type of net the previous night; 37 percent slept inside an ITN as well as inside an LLIN. Thirty-eight percent of the de facto household population slept inside an ITN or in a dwelling that was treated with IRS within the past 12 months. Children under age 5 are more likely than people of other ages to sleep inside any net (45 percent), an ITN (44 percent), an LLIN (43 percent), and in households with an ITN that were treated with IRS (44 percent).

Females are more likely than males to sleep inside any of the unspecified nets, 41 percent compared with 36 percent, respectively. The differentials in net usage between females and males decrease with the use of ITNs, LLINs, and households with ITNs or IRS treatment.

The percentage of the household population that slept inside a mosquito net the night before the survey is higher in rural areas than in urban areas. If one looks at zonal variations, the percentage of the household population that used a net the night before or that lives in a dwelling that was sprayed in the last 12 months is lowest in South East and highest in North West, where more than half of the household population slept inside any net, an ITN, an LLIN, or a household with an ITN or IRS treatment.

By wealth quintile, net usage among the household population is highest among households in the lowest quintile, with over half of the household population sleeping inside a net the night before the survey. Net usage decreases with an increase in household wealth, dropping to less than a quarter of the household population sleeping inside a net among those in the highest wealth quintile.

Among households with at least one ITN, half the household population slept inside an ITN the night before the survey. The variation by background characteristics is similar to what is observed for the previously mentioned indicators in Table 5.6.1.

Table 5.6.1 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey inside a mosquito net (treated or untreated), inside an insecticide-treated net (ITN), inside a long-lasting insecticidal net (LLIN), and inside 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 inside an ITN the night before the survey, by background characteristics, Nigeria 2015

	Household population					Household population in households with at least one ITN[1]	
Background characteristic	Percentage who slept inside any net last night	Percentage who slept inside an ITN[1] last night	Percentage who slept inside an LLIN last night	Percentage who slept inside an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept inside an ITN[1] last night	Number
Age (in years)							
<5	44.8	43.6	43.4	44.2	7,008	56.6	5,397
5-14	36.3	35.6	35.5	36.4	10,750	45.8	8,357
15-34	37.5	36.4	36.3	37.3	10,829	50.2	7,858
35-49	36.2	35.1	35.0	35.6	4,652	49.1	3,326
50+	38.1	37.0	36.9	37.9	4,234	51.4	3,048
DK/Missing	23.6	21.6	21.6	21.6	201	33.3	130
Sex							
Male	36.0	35.0	34.8	35.8	18,779	47.4	13,857
Female	40.7	39.7	39.6	40.4	18,896	52.6	14,260
Residence							
Urban	30.3	29.3	29.2	30.5	14,021	42.0	9,776
Rural	43.1	42.1	42.0	42.6	23,654	54.3	18,341
Zone							
North Central	31.0	30.2	30.1	30.7	6,467	50.3	3,884
North East	45.9	45.4	45.4	47.2	5,062	55.0	4,179
North West	55.1	54.4	54.4	54.7	11,823	59.1	10,877
South East	23.1	21.2	21.0	22.4	3,660	31.3	2,476
South South	30.3	28.9	28.5	29.8	4,563	42.3	3,122
South West	22.7	21.1	21.1	21.7	6,100	36.0	3,579
Wealth quintile							
Lowest	53.3	52.7	52.7	52.9	7,532	60.5	6,561
Second	45.6	44.7	44.7	45.2	7,535	58.0	5,803
Middle	40.4	39.6	39.5	40.2	7,536	52.2	5,712
Fourth	29.4	27.8	27.6	29.0	7,584	39.7	5,312
Highest	23.1	21.9	21.7	23.2	7,487	34.6	4,729
Total	38.4	37.3	37.2	38.1	37,674	50.0	28,117

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pre-treated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organisation.

Table 5.6.2 and Figure 5.5 presents data for each state, showing that net usage among the household population varies widely across states.

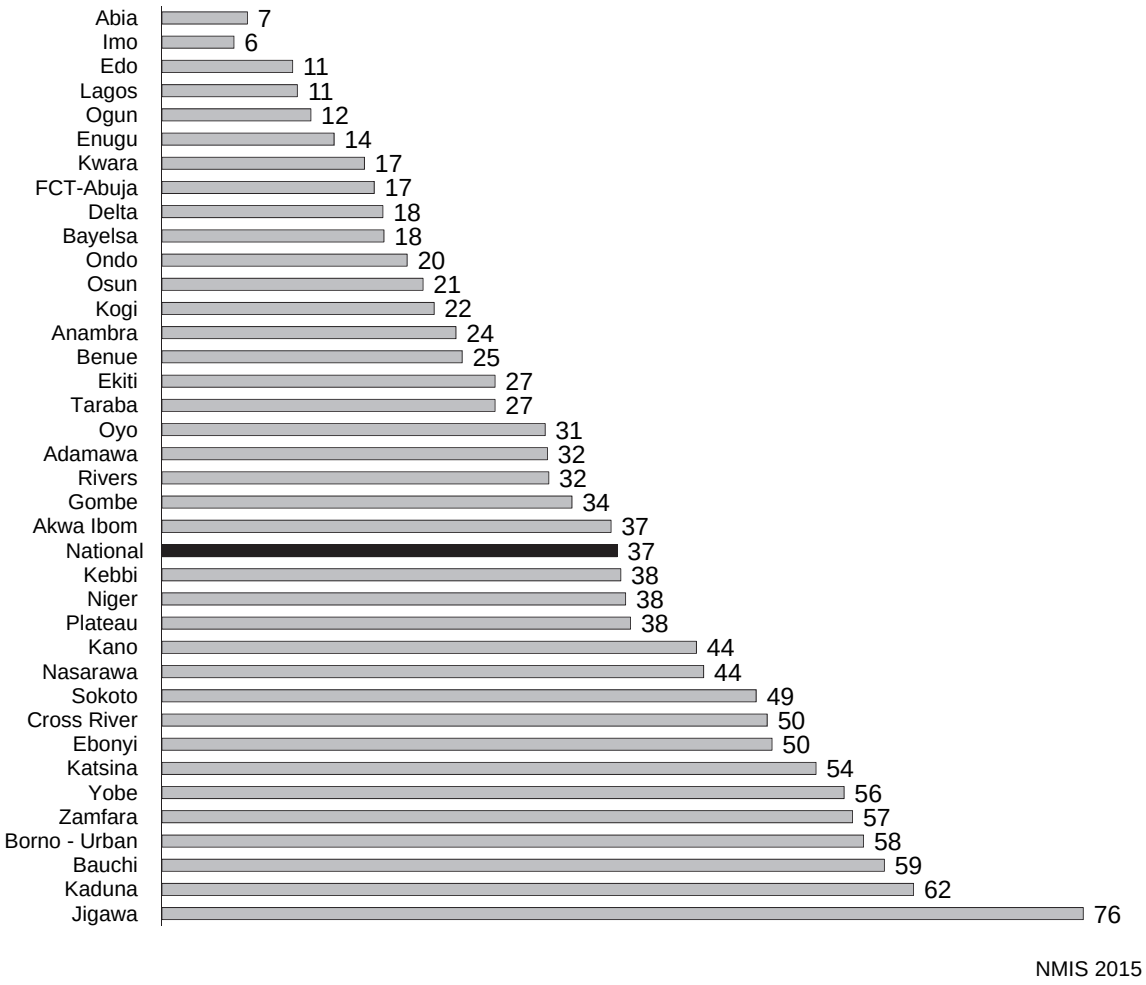
Table 5.6.2 Use of mosquito nets by persons in the household, by state

Percentage of the de facto household population who slept the night before the survey inside a mosquito net (treated or untreated), inside an insecticide-treated net (ITN), inside a long-lasting insecticidal net (LLIN), and inside 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 inside an ITN the night before the survey, by state, Nigeria 2015

	Household population					Household population in households with at least one ITN[1]	
State	Percentage who slept inside any net last night	Percentage who slept inside an ITN[1] last night	Percentage who slept inside an LLIN last night	Percentage who slept inside an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept inside an ITN[1] last night	Number
North Central							
FCT-Abuja	18.0	17.4	16.2	22.3	191	37.6	89
Benue	25.2	24.6	24.6	25.1	1,397	51.9	662
Kogi	24.3	22.3	22.2	22.3	831	38.5	482
Kwara	17.7	16.6	16.6	16.6	872	39.3	368
Nasarawa	45.0	44.4	44.4	46.8	580	54.6	471
Niger	38.2	38.0	37.6	38.0	1,406	62.2	858
Plateau	38.8	38.4	38.4	38.4	1,189	47.8	953
North East							
Adamawa	31.7	31.6	31.6	31.6	904	44.9	637
Bauchi	60.6	59.2	59.2	61.1	1,457	60.1	1,437
Borno - Urban	57.5	57.5	57.5	57.5	271	81.7	191
Gombe	34.1	33.6	33.6	38.9	761	37.5	682
Taraba	27.5	27.3	27.3	28.1	684	49.1	381
Yobe	55.9	55.9	55.9	57.9	986	64.6	852
North West							
Jigawa	76.2	75.5	75.5	75.5	1,793	78.6	1,721
Kaduna	62.5	61.6	61.6	61.7	1,596	66.6	1,475
Kano	44.4	43.8	43.8	44.1	2,386	48.2	2,170
Katsina	53.6	53.6	53.6	53.8	2,601	54.9	2,542
Kebbi	37.6	37.6	37.6	38.6	1,214	43.1	1,059
Sokoto	48.7	48.7	48.7	48.7	816	63.5	626
Zamfara	59.4	56.6	56.3	57.4	1,417	62.5	1,284
South East							
Abia	10.5	7.0	6.6	7.8	516	13.0	279
Anambra	24.9	24.1	24.1	28.0	915	31.7	694
Ebonyi	51.0	50.0	49.4	50.8	755	55.1	685
Enugu	14.1	14.1	14.1	14.1	655	21.9	423
Imo	10.4	5.9	5.9	5.9	819	12.3	396
South South							
Akwa Ibom	37.5	36.8	36.8	37.0	796	45.3	647
Bayelsa	21.5	18.2	18.0	19.0	535	36.6	267
Cross River	52.1	49.6	47.6	49.6	662	57.5	570
Delta	20.7	18.1	17.6	18.7	634	38.0	302
Edo	11.5	10.7	10.7	12.2	602	22.5	285
Rivers	31.7	31.7	31.5	33.4	1,334	40.3	1,051
South West							
Ekiti	27.5	27.3	27.3	27.3	496	33.6	404
Lagos	13.8	11.1	11.1	13.3	1,402	24.6	631
Ogun	16.0	12.2	12.2	12.7	637	28.9	269
Ondo	20.1	20.1	20.1	20.1	806	39.0	416
Osun	21.9	21.4	21.4	21.4	1,074	29.8	770
Oyo	33.2	31.4	31.4	31.5	1,685	48.5	1,089
Total	38.4	37.3	37.2	38.1	37,674	50.0	28,117

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pre-treated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or non-governmental organisation.

Figure 5.5 **ITN Use by persons in the household by state, among all households**



Tables 5.7.1 and 5.7.2 present data on the percentages of ITNs used by anyone in the household the night before the survey, at the national and state levels. Among the observed 12,496 ITNs found in the sampled households, 61 percent of the ITNs were used by someone in the household the night before the survey. The patterns in the usage of existing ITNs are similar to those observed in the above tables, with the highest percentages of the ITNs used in rural areas (65 percent), the North West Zone (76 percent), and among households in the lowest wealth quintile (78 percent).

By state, the percentage of existing ITNs used the night before the survey ranges from a low of 14 percent in Imo State to 91 percent in Borno-urban and 89 percent in Yobe State.

Figure 5.6 presents trends in ITN ownership, access, and use among the household population for the 2010 and 2015 NMIS surveys. As the data show, ITN ownership has increased by 20 percentage points over the past 5 years. However, the data for indicators relating to ITN access and use among the household population show that more efforts are needed to stress the importance of net usage in preventing malaria. In 2010, 23 percent of the household population slept inside an ITN compared with 37 percent in 2015. Similarly, ITN access for every two persons in the household has increased from 28 percent in 2010 to 35 percent in 2015. However, the percentage of existing ITNs used the night before the survey decreased from 78 percent in 2010 to 61 percent in

2015. Among households with at least 1 ITN, half of the household population slept inside an ITN last night in 2010 and 2015.

Table 5.7.1 Use of existing ITNs: National

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, by background characteristics, Nigeria 2015

Background characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
Residence		
Urban	51.7	4,183
Rural	65.4	8,313
Zone		
North Central	65.7	1,548
North East	73.3	1,732
North West	75.9	4,683
South East	31.5	1,261
South South	40.4	1,774
South West	42.7	1,498
Wealth quintile		
Lowest	77.8	2,789
Second	71.0	2,516
Middle	62.2	2,640
Fourth	46.7	2,484
Highest	40.3	2,068
Total	60.8	12,496

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a net that has been soaked with insecticide within the past 12 months.

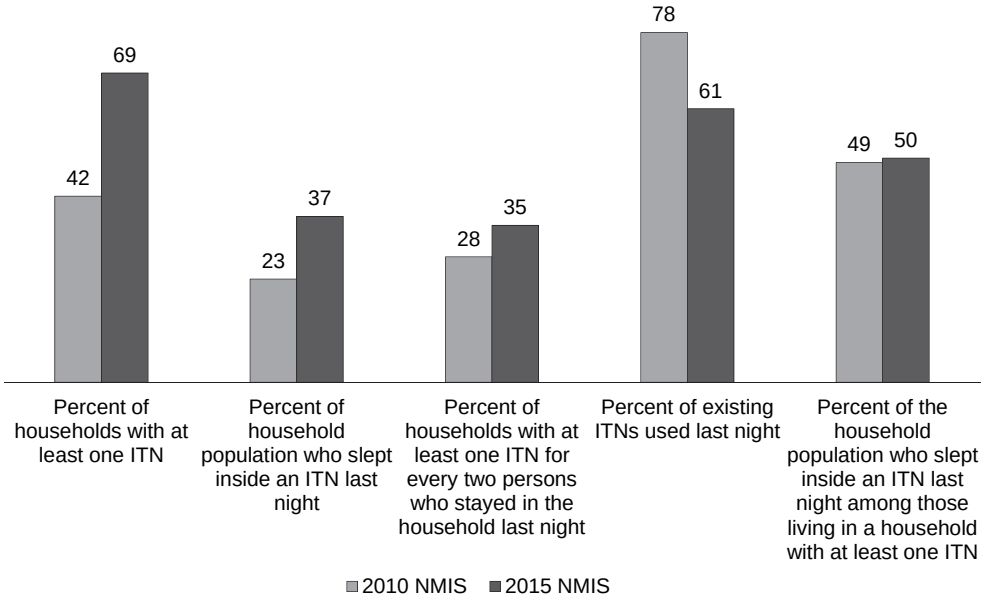
Table 5.7.2 Use of existing ITNs: States

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, by background characteristics, Nigeria 2015

Background characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
North Central		
FCT-Abuja	59.9	39
Benue	69.2	243
Kogi	56.5	179
Kwara	61.0	127
Nasarawa	65.2	189
Niger	79.5	385
Plateau	56.3	387
North East		
Adamawa	70.7	246
Bauchi	76.4	639
Borno - Urban	91.2	58
Gombe	45.0	299
Taraba	77.0	120
Yobe	88.7	370
North West		
Jigawa	83.6	834
Kaduna	88.0	703
Kano	69.1	874
Katsina	66.3	1,153
Kebbi	73.2	325
Sokoto	84.7	200
Zamfara	77.9	593
South East		
Abia	17.4	136
Anambra	28.8	401
Ebonyi	44.2	413
Enugu	35.3	149
Imo	14.4	163
South South		
Akwa Ibom	37.4	445
Bayelsa	34.5	116
Cross River	57.0	335
Delta	36.7	145
Edo	24.7	113
Rivers	38.4	620
South West		
Ekiti	35.4	204
Lagos	32.1	215
Ogun	29.3	126
Ondo	52.1	176
Osun	31.7	375
Oyo	62.5	403
Total	60.8	12,496

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a net that has been soaked with insecticide within the past 12 months.

Figure 5.6 **Trends in ITN ownership, access, and use**



5.3.2 Use of Mosquito Nets by Children under Age 5

Table 5.8 presents data by children under age 5. Forty-five percent of children under age 5 slept inside any net the night before the survey, 44 percent slept inside an ITN, 43 percent slept inside a LLIN, and 44 percent slept inside an ITN or in a dwelling that was treated with IRS. Little variation is observed by age or sex; however, greater variations are observed by residence, zone, and wealth quintile. Net usage for children is higher among those living in rural areas, in the North West Zone, and in children living in households in the lowest wealth quintile. Figure 5.7 presents data for ITN usage among children under age 5, by background characteristics.

Overall, more than half of children living in households with at least 1 ITN slept inside an ITN the night before the survey (57 percent). Children less than a year old were most likely to have slept inside an ITN than older children (60 percent). Likewise, a higher percentage of children residing in rural areas slept inside an ITN compared to their urban counterparts (60 and 48 percent, respectively). Among the zones, two-thirds of children in households with at least 1 ITN in North West (66 percent) slept inside a net compared to about one-third of children in South East (35 percent). Net usage by wealth quintile is highest in the lowest quintile, and decreases with increasing household wealth.

Table 5.8 Use of mosquito nets by children

Percentage of children under five years of age who, the night before the survey, slept inside a mosquito net (treated or untreated), inside an insecticide-treated net (ITN), inside a long-lasting insecticidal net (LLIN), and inside an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among children under age 5 in households with at least one ITN, the percentage who slept inside an ITN the night before the survey, by background characteristics, Nigeria 2015

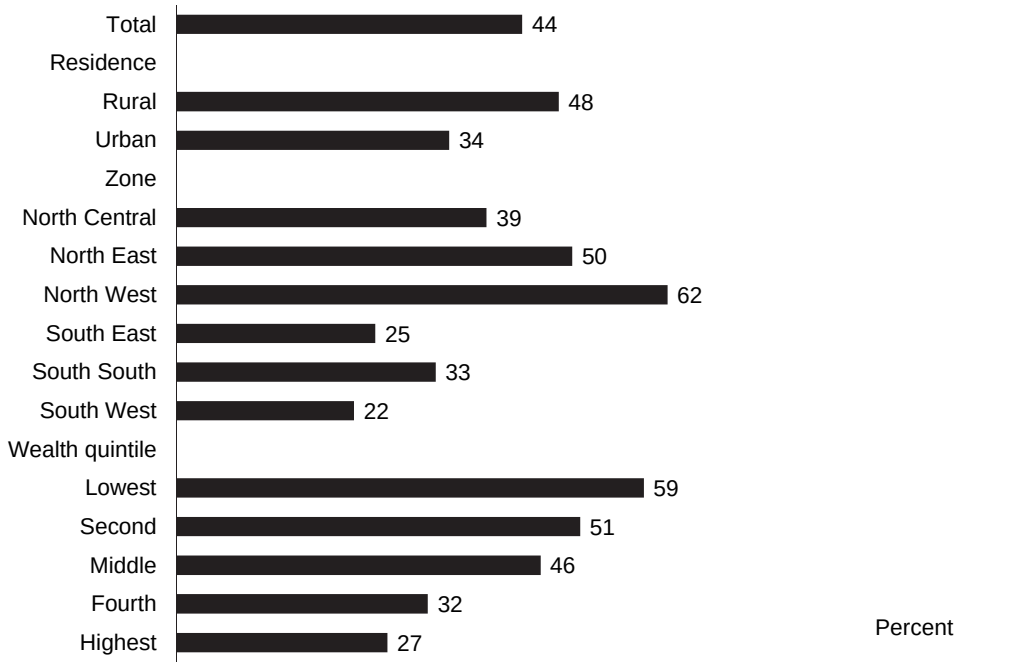
	Children under 5 in all households					Children under 5 in households with at least one ITN[1]	
Background characteristic	Percentage who slept inside any net last night	Percentage who slept inside an ITN[1] last night	Percentage who slept inside an LLIN last night	Percentage who slept inside an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of children	Percentage who slept inside an ITN[1] last night	Number of children
Age (in months)							
<12	47.5	46.0	45.9	46.5	1,298	59.6	1,001
12-23	45.8	43.8	43.5	44.1	1,366	57.9	1,032
24-35	47.5	46.3	46.2	47.2	1,352	58.8	1,066
36-47	42.2	41.5	41.2	41.8	1,505	54.8	1,139
48-59	41.9	41.1	40.9	42.1	1,488	52.7	1,159
Sex							
Male	45.1	44.1	43.9	44.7	3,569	57.3	2,745
Female	44.6	43.1	42.9	43.8	3,440	55.9	2,652
Residence							
Urban	35.6	34.4	34.1	35.6	2,349	48.4	1,671
Rural	49.5	48.2	48.1	48.6	4,659	60.3	3,726
Zone							
North Central	39.6	39.1	38.8	39.3	1,305	59.7	854
North East	50.4	49.9	49.9	51.1	987	60.6	813
North West	62.8	61.9	61.9	62.2	2,280	65.9	2,141
South East	27.6	25.1	24.6	26.6	602	34.7	437
South South	35.4	32.7	31.8	33.7	777	46.3	548
South West	24.0	22.4	22.4	23.1	1,057	39.2	604
Wealth quintile							
Lowest	59.1	58.9	58.9	58.9	1,473	67.1	1,292
Second	51.9	50.9	50.8	51.3	1,617	65.7	1,251
Middle	47.1	45.9	45.8	46.5	1,334	57.1	1,073
Fourth	33.7	31.7	31.3	32.7	1,288	43.6	937
Highest	28.5	26.6	26.3	27.9	1,297	40.9	844
Total	44.8	43.6	43.4	44.2	7,008	56.6	5,397

Notes: Table is based on children who stayed in the household the night before the interview. Estimates for North East Zone do not include the rural areas of Borno State.

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

[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organisation.

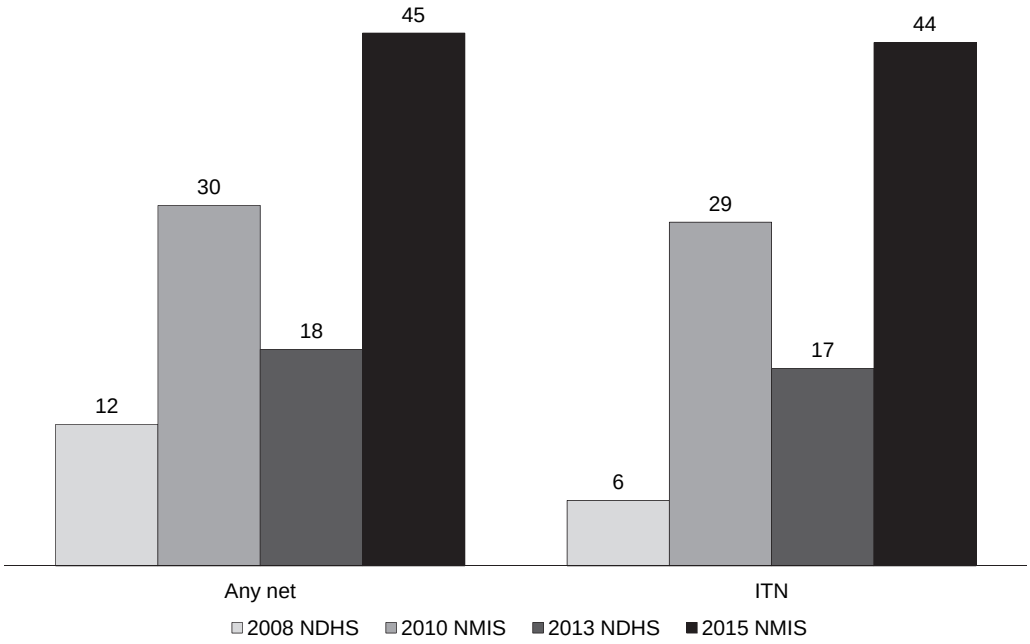
Figure 5.7 Differentials in ITN usage among children under age 5



NMIS 2015

Trends in net usage among children under age 5 are shown in Figure 5.8 using data from the 2008 NDHS, 2010 NMIS, and 2015 NMIS. Note that there is significant variation between the NDHS and NMIS findings. The data collection periods for the surveys occurred during different malaria transmission seasons, which may have caused some variation of data. Also, the NMIS which focuses on malaria, is shorter than the NDHS, which includes questions on various health topics. Overall, net usage among children under age 5 has increased.

Figure 5.8 **Trends in net use among children under age 5**



5.3.3 Use of Mosquito Nets by All Women

Table 5.9.1 shows data on mosquito net usage for all females age 15-49 in the selected households, by background characteristics at the national level. Forty-two percent of women in households slept inside any net the night before the survey, and 41 percent slept inside an ITN and an LLIN. Forty-two percent of women slept inside an ITN or in a dwelling that had been sprayed with IRS in the past 12 months. Among households with at least 1 ITN, 55 percent of women slept inside an ITN.

There is not much variation in net usage by age group. However, net usage is higher among women living in rural areas than women in urban areas. Net usage decreases with an increase in household wealth.

Data for the states are presented in Table 5.9.2.

Table 5.9.1 Use of mosquito nets by all women: National

Percentage of all women age 15-49 who, the night before the survey, slept inside 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 all women in households with at least one ITN, the percentage who slept inside an ITN the night before the survey, by background characteristics, Nigeria 2015

	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 inside any net last night	Percentage who slept inside an ITN[1] last night	Percentage who slept inside an LLIN last night	Percentage who slept inside an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept inside an ITN[1] last night	Number
Age (years)							
15-19	38.1	37.4	37.4	38.2	1,380	49.6	1,039
20-24	45.5	44.1	43.8	44.6	1,532	58.6	1,153
25-29	42.2	41.0	40.8	41.6	1,630	55.3	1,210
30-34	43.4	42.5	42.5	43.4	1,324	58.9	956
35-39	41.8	40.6	40.5	41.1	967	55.1	712
40-44	39.9	38.8	38.8	39.1	735	52.9	539
45-49	40.0	39.8	39.5	40.3	463	52.0	354
Residence							
Urban	31.6	30.3	30.2	31.4	3,128	43.9	2,163
Rural	48.6	47.6	47.5	48.0	4,903	61.5	3,800
Zone							
North Central	34.4	33.7	33.6	34.1	1,356	55.3	827
North East	50.2	49.7	49.7	51.1	1,077	61.3	872
North West	63.5	62.9	62.9	63.2	2,358	68.3	2,173
South East	22.8	20.6	20.3	21.5	811	31.6	528
South South	32.1	30.8	30.2	31.7	1,080	44.6	746
South West	24.7	22.9	22.9	23.3	1,350	37.9	817
Wealth quintile							
Lowest	61.8	61.7	61.7	61.8	1,449	70.1	1,275
Second	52.1	51.0	50.9	51.7	1,528	66.0	1,182
Middle	45.4	44.7	44.6	45.0	1,566	57.9	1,209
Fourth	32.1	30.2	30.0	31.5	1,652	43.4	1,150
Highest	23.7	22.5	22.3	23.1	1,837	36.0	1,147
Total	41.9	40.9	40.8	41.5	8,031	55.1	5,963

Notes: Estimates for North East Zone do not include the rural areas of Borno State. Figures in parentheses are based on 25-49 unweighted cases. 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 net that has been soaked with insecticide within the past 12 months.

[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organisation

Table 5.9.2 Use of mosquito nets by all women: States

Percentage 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 (IRS) in the past 12 months; and among all women in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by state, Nigeria 2015

	Among all women age 15-49 in all households					Among all women age 15-49 in households with at least one ITN[1]	
State	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept under an ITN[1] last night	Number
North Central							
FCT-Abuja	17.5	17.0	15.8	21.5	46	38.2	20
Benue	29.7	29.7	29.7	29.7	267	59.6	133
Kogi	21.7	19.9	19.9	19.9	188	36.8	102
Kwara	19.5	18.1	18.1	18.1	195	42.3	84
Nasarawa	44.8	44.4	44.4	46.0	131	55.8	104
Niger	45.8	45.2	44.8	45.2	285	70.2	184
Plateau	45.3	45.3	45.3	45.3	244	55.3	200
North East							
Adamawa	33.1	33.1	33.1	33.1	209	46.6	148
Bauchi	73.3	71.7	71.7	73.5	284	72.3	282
Borno - Urban	52.7	52.7	52.7	52.7	58	82.1	37
Gombe	39.6	39.3	39.3	44.0	155	43.5	140
Taraba	29.8	29.5	29.5	29.9	163	54.7	88
Yobe	59.1	59.1	59.1	60.2	207	69.2	177
North West							
Jigawa	86.6	85.7	85.7	85.7	371	89.7	354
Kaduna	69.0	68.7	68.7	68.7	305	73.8	284
Kano	51.6	51.2	51.2	51.2	491	56.4	446
Katsina	59.6	59.6	59.6	60.2	518	60.5	510
Kebbi	51.5	51.5	51.5	52.6	198	57.2	178
Sokoto	56.1	56.1	56.1	56.1	178	75.3	132
Zamfara	67.6	65.2	65.2	66.0	297	72.4	268
South East							
Abia	11.4	6.5	6.2	7.9	123	12.6	64
Anambra	24.9	24.1	24.1	26.3	177	33.6	127
Ebonyi	51.3	50.2	48.8	51.2	159	55.4	144
Enugu	16.5	16.5	16.5	16.5	162	24.9	108
Imo	9.7	5.0	5.0	5.0	189	11.1	86
South South							
Akwa Ibom	42.3	41.7	41.7	41.9	187	53.8	145
Bayelsa	23.2	19.3	19.3	19.8	126	40.7	60
Cross River	54.9	53.6	51.1	53.6	151	60.5	133
Delta	21.5	18.3	17.8	18.9	144	38.3	69
Edo	8.9	7.3	7.3	10.5	112	14.3	57
Rivers	31.9	31.9	31.4	33.1	361	40.8	282
South West							
Ekiti	30.2	29.5	29.5	29.5	99	34.6	84
Lagos	15.3	12.8	12.8	13.8	358	29.0	158
Ogun	17.0	11.9	11.9	12.9	151	26.7	67
Ondo	26.3	26.3	26.3	26.3	145	44.8	85
Osun	26.4	25.8	25.8	25.8	235	33.6	180
Oyo	34.0	32.6	32.6	32.6	362	48.7	242
Total	41.9	40.9	40.8	41.5	8,031	55.1	5,963

Notes: Figures in parentheses are based on 25-49 unweighted cases. Table is based on women who stayed in the household the night before the interview. Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or nongovernmental organisation.

5.3.4 Use of Mosquito Nets by Pregnant Women

Table 5.10 shows that about half of pregnant women age 15-49 report sleeping inside a mosquito net (50 percent), an ITN (49 percent), an LLIN (49 percent), and inside an ITN or in a household sprayed with IRS

in the past 12 months (49 percent), the night before the survey. Among households with at least 1 ITN, 62 percent of pregnant women slept inside an ITN last night.

Net usage varies by residence, zone, educational attainment, and wealth quintile. Among pregnant women in all households, those in rural areas are more likely to use a mosquito net than their urban counterparts. For example, 55 percent of pregnant women in rural areas slept inside an ITN compared with 36 percent in urban areas. Among zones, ITN usage is lowest in the South East (23 percent) and highest in the North West (68 percent). More than half of pregnant women with no education slept inside an ITN the previous night (62 percent), compared with about 48 percent of pregnant women with a primary education and 33 percent of pregnant women with a secondary education. An increase in household wealth is inversely associated with ITN usage. Women in the lowest wealth quintile are more than twice as likely as women in the highest wealth quintile to have slept inside an ITN the previous night (66 and 30 percent, respectively).

Table 5.10 Use of mosquito nets by pregnant women

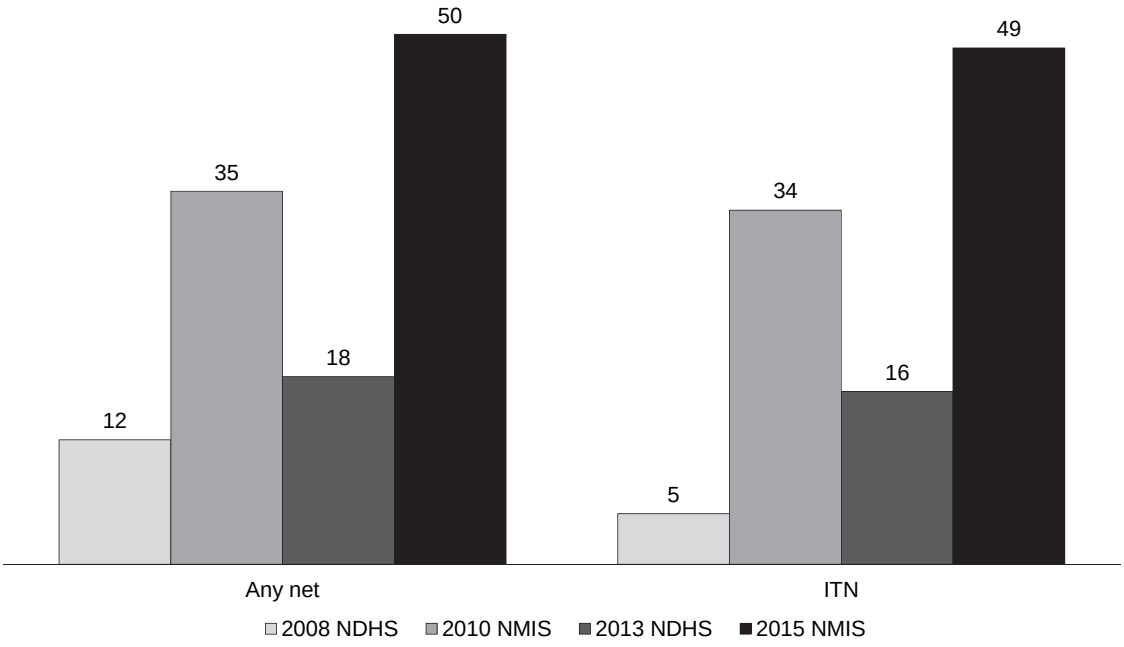
Percentages of pregnant women age 15-49 who, the night before the survey, slept inside a mosquito net (treated or untreated), inside an insecticide-treated net (ITN), inside a long-lasting insecticidal net (LLIN), and inside an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept inside an ITN the night before the survey, by background characteristics, Nigeria 2015

	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 inside any net last night	Percentage who slept inside an ITN[1] last night	Percentage who slept inside an LLIN last night	Percentage who slept inside an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of women	Percentage who slept inside an ITN[1] last night	Number of women
Residence							
Urban	37.5	36.0	35.4	36.6	271	50.0	196
Rural	55.9	54.7	54.7	55.0	626	67.0	511
Zone							
North Central	39.5	37.8	37.8	37.8	129	61.8	79
North East	57.2	55.5	55.5	56.8	140	62.5	124
North West	68.6	67.8	67.8	67.8	325	72.0	306
South East	24.9	23.1	20.9	24.7	77	36.5	48
South South	33.4	33.4	33.4	34.1	107	49.4	72
South West	35.6	33.2	33.2	33.2	119	52.1	76
Education							
No education	63.1	61.9	61.9	62.2	407	72.5	347
Primary	48.9	48.1	47.0	48.5	156	59.7	125
Secondary	34.0	32.7	32.7	33.5	254	47.2	176
More than secondary	40.0	37.3	37.3	37.3	81	52.4	58
Wealth quintile							
Lowest	66.9	66.1	66.1	66.3	231	69.6	220
Second	60.0	58.7	58.2	58.9	183	73.3	147
Middle	50.6	49.5	49.5	49.8	167	65.7	126
Fourth	34.5	31.0	30.4	32.4	141	47.0	93
Highest	30.7	30.4	30.4	30.8	175	43.9	121
Total	50.3	49.0	48.8	49.4	897	62.3	706

Notes: Figures in parentheses are based on 25-49 unweighted cases. Table is based on women who stayed in the household the night before the interview. Estimates for North East Zone do not include the rural areas of Borno State.
[1] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or nongovernmental organisation.

Trends in net usage among pregnant women are shown in Figure 5.9. The patterns are similar to those observed for children under age 5. Overall, the data show an increase in net usage among pregnant women.

Figure 5.9 **Trends in net use among pregnant women**



5.4 MOSQUITO NET NON-USE AND NET PREFERENCES

5.4.1 Reasons a Household Does Not Currently Own a Net

To better understand why households do not own a mosquito net and how they might increase net ownership and usage in the future, the respondents were asked to give reasons for their lack of ownership. Among households that had previously owned a net, respondents were asked why they no longer owned one.

Table 5.11.1 shows reasons for not owning a mosquito net, as reported by the household respondents. Among the households sampled, 29 percent do no currently own a mosquito net. When asked about the reasons for lack of ownership, the most common one cited was that the nets are not available (75 percent). Ten percent of household respondents report that they do not like to use mosquito nets, 6 percent say the nets are too expensive, and 4 percent say that there are no mosquitoes.

Ten percent of households do not currently own a mosquito net yet have previously owned a net. Among these households, respondents were asked why their household no longer has a mosquito net. The most common reason cited was that the net was too old (41 percent), there were no available nets (26 percent), and the nets had been thrown away (18 percent). Seventeen percent of respondents report that their household has netting on the windows. Twelve percent of respondents say that they do not like to use mosquito nets, while 3 percent say there are no mosquitoes, and 2 percent say the nets are too expensive.

Table 5.11.2 presents the same data at the state level.

Table 5.11.1 Reasons household does not currently own any mosquito nets: National

Percentage of households that do not currently own a mosquito net, and among households that do not currently own a mosquito net, the percentage that cite specific reasons why the household does not currently own a mosquito net; percentage of households that do not currently own a mosquito net but previously owned a net, and among households that previously owned a mosquito net, percentage that cite specific reasons why the household no longer has a mosquito net, according to background characteristics, Nigeria 2015

			Reasons for no current ownership of net						Percentage of households that do not currently own a mosquito net, but previously owned a net		Among households who previously owned a mosquito net, the reasons they cite for no longer having a mosquito net							
Background characteristic	Percentage of households that do not currently own a mosquito net	Number of house-holds	No mos-quitoes	Nets not available	Do not like to use mosquito nets	Too expensive	Other	Number of house-holds that currently do not own a net		Number of house-holds	No mos-quitoes	Nets not available	Do not like to use mosquito nets	Too expensive	Net was old	Threw net away	House-hold has netting on windows	Number of house-holds that previously owned a net
Age																		
15-19	27.1	1,522	3.5	72.0	10.9	9.0	6.8	412	9.8	1,522	1.2	29.0	13.8	3.0	41.8	15.2	3.9	150
20-24	27.3	1,572	5.1	73.9	11.5	6.4	5.4	429	8.4	1,572	4.8	21.1	12.1	4.1	36.5	19.7	0.8	133
25-29	29.5	1,740	4.7	78.1	7.6	4.8	7.1	513	10.1	1,740	1.8	27.1	10.8	1.3	39.4	17.6	4.6	176
30-34	30.4	1,216	4.5	71.1	13.8	7.1	5.2	370	12.5	1,216	4.0	20.3	10.5	0.4	47.1	24.8	7.1	152
35-39	30.6	821	3.8	78.4	7.7	4.5	7.0	251	10.3	821	3.7	31.5	10.4	0.6	42.9	14.0	0.0	84
40-44	31.3	555	4.9	69.5	11.0	7.7	8.0	174	12.3	555	3.2	28.1	10.3	0.8	43.7	16.3	0.0	68
45-49	28.2	319	2.2	82.9	12.0	3.6	0.0	90	11.8	319	0.0	35.8	14.8	5.7	35.0	10.3	0.0	38
Residence																		
Urban	34.2	3,087	5.9	71.4	14.1	4.1	5.8	1,056	13.6	3,087	3.1	27.0	14.3	1.1	38.6	15.0	10.9	419
Rural	25.4	4,658	3.0	77.4	7.2	8.4	6.5	1,183	8.2	4,658	2.5	25.2	8.7	3.0	44.4	21.3	5.6	382
Zone																		
North Central	43.1	1,311	5.6	75.6	3.3	12.0	7.7	565	12.8	1,311	4.4	21.1	6.2	3.3	44.8	24.4	3.9	168
North East	19.9	843	2.3	71.8	11.7	12.9	2.7	168	7.8	843	2.7	36.9	9.6	6.3	30.6	13.8	3.6	66
North West	8.7	1,993	5.5	63.1	15.6	1.9	13.9	173	2.6	1,993	7.6	28.7	27.9	1.9	16.5	14.3	0.0	53
South East	30.0	875	3.8	79.7	7.0	3.2	6.4	263	10.4	875	2.0	31.9	11.8	0.9	48.0	9.5	1.6	91
South South	33.7	1,154	4.2	64.1	18.6	7.6	7.1	389	12.3	1,154	2.5	15.6	12.3	0.7	41.5	21.6	3.5	142
South West	43.4	1,569	3.8	81.3	11.4	1.8	3.2	681	18.0	1,569	1.5	29.6	11.9	1.2	44.2	16.8	3.9	282
Wealth quintile																		
Lowest	13.2	1,242	4.5	80.8	3.0	3.2	8.5	164	3.9	1,242	5.6	23.0	7.4	5.1	32.9	23.2	0.0	48
Second	26.8	1,441	1.8	81.3	3.8	9.4	5.1	386	7.3	1,441	3.7	28.4	9.2	2.7	46.9	17.0	1.2	106
Middle	27.2	1,544	2.5	79.8	7.1	8.9	4.3	420	9.1	1,544	0.9	33.1	6.6	2.7	48.3	15.2	0.6	140
Fourth	32.8	1,710	5.2	71.4	11.9	6.4	7.3	561	12.1	1,710	2.9	19.3	10.6	2.3	46.2	19.3	9.0	207
Highest	39.1	1,808	6.0	68.9	16.6	4.0	6.5	707	16.6	1,808	3.0	27.3	16.2	0.7	34.2	18.0	5.7	300
Total	28.9	7,745	4.3	74.6	10.4	6.4	6.2	2,238	10.3	7,745	2.8	26.1	11.6	2.0	41.4	18.0	16.5	801

Note: Estimates for North East Zone do not include the rural areas of Borno State.

Table 5.11.2 Reasons household does not currently own any mosquito nets: States

Percentage of households that do not currently own a mosquito net, and among households that do not currently own a mosquito net, the percentage that cite specific reasons why the household does not currently own a mosquito net; percentage of households that do not currently own a mosquito net but previously owned a net, and among households that previously owned a mosquito net, percentage that cite specific reasons why the household no longer has a mosquito net, according to state, Nigeria 2015

State	Percentage of households that do not currently own a mosquito net	Number of households	Reasons for no current ownership of net					Number of house-holds that currently do not own a net	Percentage of households that do not currently own a mosquito net, but previously owned a net	Number of house-holds	Among households who previously owned a mosquito net, the reasons they cite for no longer having a mosquito net							
			No mos-quitoes	Nets not available	Do not like to use mosquito nets	Too expensive	Other				No mos-quitoes	Nets not available	Do not like to use mosquito nets	Too ex-pensive	Net was old	Threw net away	Household has netting on windows	Number of households that previously owned a net
North Central																		
FCT-Abuja	51.5	41	22.1	67.8	7.5	2.6	3.6	21	20.1	41	(15.6)	(13.3)	(9.1)	(0)	(44.6)	(21.8)	(0.9)	8
Benue	57.4	313	3.3	82.5	0.2	2.2	11.8	180	13.6	313	(0)	(9.2)	(0)	(0)	(59.4)	(43)	(1.9)	42
Kogi	40.9	174	1.8	64.0	7.9	49.7	3.6	71	12.4	174	*	*	*	*	*	*	*	22
Kwara	60.8	195	13.6	50.1	4.9	23.7	10.6	119	26.2	195	9.6	28.2	12.4	6.1	25.1	13.9	0.0	51
Nasarawa	22.4	92	2.6	76.7	16.3	0.0	4.4	21	15.0	92	*	*	*	*	*	*	*	14
Niger	37.9	293	0.0	94.0	1.1	0.0	5.0	111	5.9	293	*	*	*	*	*	*	*	17
Plateau	21.1	202	6.8	91.7	1.5	0.0	0.0	43	6.7	202	(0)	(26)	(10.7)	(0)	(31.1)	(25.3)	(1.1)	14
North East																		
Adamawa	29.4	150	2.9	80.3	10.5	3.4	4.5	44	13.3	150	(9)	(55.4)	(12.5)	(0)	(18.2)	(3.8)	(0.5)	20
Bauchi	1.4	235	0.0	100.0	0.0	0.0	0.0	3	0.7	235	*	*	*	*	*	*	*	2
Borno - Urban	35.9	48	0.0	22.3	59.3	16.2	2.3	17	9.0	48	*	*	*	*	*	*	*	4
Gombe	12.8	122	0.0	95.9	4.1	0.0	0.0	16	10.0	122	*	*	*	*	*	*	*	12
Taraba	46.4	128	2.7	66.8	3.6	26.4	2.9	59	14.1	128	(0)	(9.6)	(3.6)	(23)	(35.6)	(32.4)	(0)	18
Yobe	17.4	161	3.4	83.2	6.5	5.4	1.5	28	5.8	161	*	*	*	*	*	*	*	9
North West																		
Jigawa	4.6	301	0.0	28.8	10.2	0.0	60.9	14	2.0	301	*	*	*	*	*	*	*	6
Kaduna	7.2	274	10.0	80.4	4.8	0.0	4.8	20	4.8	274	*	*	*	*	*	*	*	13
Kano	11.0	423	3.7	43.3	37.1	0.0	15.8	47	2.3	423	*	*	*	*	*	*	*	10
Katsina	2.4	409	18.6	61.8	19.6	0.0	0.0	10	1.9	409	*	*	*	*	*	*	*	8
Kebbi	13.3	200	0.0	59.3	5.9	12.6	22.1	27	4.4	200	*	*	*	*	*	*	*	9
Sokoto	22.2	157	5.0	82.3	8.4	0.0	4.3	35	2.3	157	*	*	*	*	*	*	*	4
Zamfara	9.9	229	10.2	84.8	5.0	0.0	0.0	23	1.5	229	*	*	*	*	*	*	*	3
South East																		
Abia	33.5	134	8.3	81.8	7.6	0.0	2.3	45	4.1	134	*	*	*	*	*	*	*	5
Anambra	25.2	234	2.3	72.7	7.8	7.8	9.4	59	9.0	234	*	*	*	*	*	*	*	21
Ebonyi	10.5	151	0.0	95.5	0.0	0.0	4.5	16	5.5	151	*	*	*	*	*	*	*	8
Enugu	43.4	165	1.5	85.3	9.7	1.2	2.2	72	11.7	165	(2.8)	(39.3)	(20.1)	(0)	(37.7)	(0)	(0)	19
Imo	37.5	192	5.2	75.3	4.7	4.0	10.9	72	19.1	192	(0)	(39)	(5.3)	(2.3)	(37.4)	(11)	(0)	37
South																		
Akwa Ibom	24.5	204	0.0	72.4	16.4	7.4	4.1	50	9.1	204	*	*	*	*	*	*	*	19
Bayelsa	49.0	120	6.8	44.2	32.1	13.9	5.4	59	19.2	120	(5.1)	(15.1)	(20.6)	(4.1)	(41.6)	(22.5)	(0)	23
Cross River	14.0	180	0.0	79.4	13.8	10.2	0.0	25	4.6	180	*	*	*	*	*	*	*	8
Delta	50.4	160	9.1	62.1	8.2	11.7	10.6	81	15.8	160	(0)	(2.2)	(0)	(0)	(43.6)	(28.9)	(0)	25
Edo	60.3	153	3.9	63.4	23.7	2.3	9.2	92	21.8	153	(3)	(7.2)	(16)	(0)	(46.5)	(21.4)	(0.7)	33
Rivers	24.2	337	1.7	70.9	17.0	4.1	6.3	82	10.1	337	*	*	*	*	*	*	*	34
South West																		
Ekiti	26.6	138	13.9	63.4	14.9	6.7	4.8	37	8.8	138	*	*	*	*	*	*	*	12
Lagos	47.2	314	5.5	82.5	9.2	0.0	4.4	148	24.5	314	4.7	10.4	14.4	1.4	39.7	21.0	0.0	77
Ogun	49.5	172	3.8	75.3	15.8	4.3	8.6	85	31.0	172	0.0	17.2	17.5	0.9	64.9	38.8	1.9	53
Ondo	49.9	248	0.8	84.5	8.6	3.3	2.9	124	19.5	248	(0)	(46.5)	(5.8)	(3.9)	(41.2)	(8.3)	(0)	48
Osun	33.9	300	4.2	85.2	8.1	0.0	2.6	102	13.6	300	(0)	(36.4)	(3.2)	(0)	(49.4)	(10.9)	(0)	41
Oyo	46.6	396	2.4	82.7	13.8	1.1	0.0	185	12.6	396	(0)	(55.3)	(14.8)	(0)	(24.1)	(1.8)	(2)	50
Total	28.9	7,745	4.3	74.6	10.4	6.4	6.2	2,238	10.3	7,745	2.8	26.1	11.6	2.0	41.4	18.0	16.5	801

Notes: 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. Estimates for North East Zone do not include the rural areas of Borno State.

5.4.2 Reasons Mosquito Nets Owned by the Household Were Not Used the Night before the Interview

Net ownership does not guarantee usage. To better understand why individuals do not use the nets to which they have access, the 2015 NMIS collected information on mosquito net use among the household respondents, other household members, and visitors in the sampled households.

Net usage among household respondents

Each household respondent was asked if they slept inside a mosquito night the night before the interview. This question was asked directly of the household respondent without reference to a specific net. The household respondent was asked, "Did you sleep inside a mosquito net last night?" Household respondents who replied that they did not sleep inside a mosquito net were asked, "What would encourage you to sleep inside a mosquito net?"

Table 5.12.1 shows that 25 percent of household respondents did not sleep inside a mosquito net the night before the interview. Forty-two percent of household respondents say that they would sleep inside a net if it weren't so hot when inside the net, and 13 percent say that they would use the net if there were mosquitos around. Nine percent of household respondents would use a net if it were not itchy or irritating to them, while another 9 percent say that they would use a net if they could easily hang the net. Six percent of household respondents say that they would sleep inside a mosquito net if it did not smell bad, and 4 percent said they would sleep inside a net if it was bigger or did not feel so claustrophobic.

Table 5.12.2 presents data at the state level.

Table 5.12.1 Net non-usage among household respondents and things that would encourage them to sleep inside a mosquito net: National

Among households that own a mosquito net, the percentage of household questionnaire respondents who did not sleep under a net the previous night, and the percentage who cite specific things that would encourage them to sleep inside a mosquito net, according to background characteristics, Nigeria 2015

Background characteristic	Percentage of household respondents who did not sleep inside a mosquito net the previous night	Number of households	Things that would encourage the household respondent to sleep inside a mosquito net among household respondents who live in households that own a net									Number of household respondents who did not sleep inside a mosquito net the previous night
			Could easily hang net	If net were not hot	If it did not smell	If net were a different colour	If net were not itchy or irritating	If net were bigger / not claustro-phobic	If there were mosquitoes present	Other	Don't know	
Age												
15-19	22.4	1,522	10.7	39.2	6.2	0.4	9.2	4.1	10.8	11.7	13.3	341
20-24	22.3	1,572	5.6	42.6	4.9	1.1	9.1	4.3	15.3	12.5	12.3	350
25-29	25.0	1,740	6.7	46.9	4.9	1.3	6.9	3.2	11.6	16.3	8.9	435
30-34	25.3	1,216	8.2	38.5	5.7	2.7	7.3	4.1	12.5	13.9	14.2	308
35-39	29.5	821	11.2	39.4	6.4	2.0	9.8	4.0	13.2	7.8	15.0	242
40-44	25.2	555	10.7	43.2	8.6	1.3	8.9	2.5	10.3	15.9	6.8	140
45-49	25.3	319	12.3	36.5	1.9	0.0	17.6	1.8	13.5	12.2	15.4	81
Residence												
Urban	29.6	3,087	10.5	41.8	7.1	1.7	9.9	3.5	10.3	14.1	11.4	914
Rural	21.1	4,658	6.8	41.6	4.2	1.1	7.7	3.8	14.4	12.2	12.7	983
Zone												
North Central	17.4	1,311	4.5	42.7	7.1	0.8	3.6	1.2	6.9	22.4	15.3	229
North East	17.5	843	5.9	50.1	4.4	1.3	14.9	3.3	9.7	13.2	5.3	148
North West	17.5	1,993	4.8	31.5	3.0	1.3	4.1	4.4	20.8	15.6	16.7	348
South East	40.7	875	13.3	44.8	3.4	0.6	6.4	3.8	10.3	13.8	8.0	356
South South	31.2	1,154	9.0	33.3	3.2	0.3	8.1	5.4	22.1	8.3	14.3	360
South West	29.1	1,569	10.3	50.4	10.9	3.2	15.2	3.1	3.9	9.7	10.5	457
Wealth quintile												
Lowest	15.6	1,242	1.5	37.1	1.6	1.1	2.7	2.3	17.2	23.2	13.4	194
Second	14.0	1,441	5.2	38.7	2.4	1.2	7.0	2.7	16.8	11.6	17.3	202
Middle	21.5	1,544	12.8	41.7	4.0	0.5	9.4	4.0	11.9	10.1	11.7	333
Fourth	31.8	1,710	9.1	42.3	6.1	1.0	10.0	4.2	11.7	10.2	11.1	544
Highest	34.5	1,808	9.1	43.5	8.3	2.3	9.8	3.9	10.6	14.6	11.0	624
Total	24.5	7,745	8.6	41.7	5.6	1.4	8.8	3.7	12.5	13.1	12.1	1,897

Note: Estimates for North East Zone do not include the rural areas of Borno State.

Table 5.12.2 Net non-usage among household respondents and things that would encourage them to sleep inside a mosquito net: States

Among households that own a mosquito net, the percentage of household questionnaire respondents who did not sleep under a net the previous night, and the percentage who cite specific things that would encourage them to sleep inside a mosquito net, according to state, Nigeria 2015

State	Percentage of household respondents who did not sleep inside a mosquito net the previous night	Number of households	Things that would encourage the household respondent to sleep inside a mosquito net among household respondents who live in households that own a net									
			Could easily hang net	If net were not hot	If it did not smell	If net were a different colour	If net were not itchy or irritating	If net were bigger / not claustro-phobic	If there were mosquitoes present	Other	Don't know	Number of household respondents who did not sleep inside a mosquito net the previous night
North Central												
FCT-Abuja	19.6	41	(16.3)	(17.0)	(3.4)	(0.0)	(0.0)	(3.5)	(20.5)	(9.5)	(35.7)	8
Benue	13.0	313	(9.7)	(39.0)	(20.2)	(4.7)	(8.7)	(0.0)	(0.0)	(27.4)	(9.7)	41
Kogi	28.4	174	4.4	44.2	6.0	0.0	6.4	1.5	12.5	21.3	3.7	49
Kwara	11.6	195	*	*	*	*	*	*	*	*	*	23
Nasarawa	22.7	92	(1.2)	(51.8)	(2.4)	(0.0)	(0.0)	(1.9)	(2.4)	(14.8)	(25.4)	21
Niger	11.0	293	*	*	*	*	*	*	*	*	*	32
Plateau	27.2	202	2.6	68.6	0.0	0.0	1.2	0.0	2.2	20.6	4.9	55
North East												
Adamawa	14.0	150	(3.4)	(28.8)	(7.4)	(0.0)	(14.8)	(8.5)	(29.1)	(2.1)	(11.3)	21
Bauchi	18.0	235	(1.5)	(67.0)	(7.0)	(0.0)	(5.3)	(0.0)	(0.0)	(16.2)	(4.5)	42
Borno - Urban	6.3	48	*	*	*	*	*	*	*	*	*	3
Gombe	38.6	122	11.0	60.7	2.4	0.0	34.2	5.7	0.0	1.4	1.3	47
Taraba	15.5	128	(3.8)	(33.1)	(4.4)	(6.9)	(3.3)	(0.0)	(23.4)	(19.3)	(14.7)	20
Yobe	9.2	161	*	*	*	*	*	*	*	*	*	15
North West												
Jigawa	7.0	301	*	*	*	*	*	*	*	*	*	21
Kaduna	13.3	274	(6.6)	(19.3)	(2.7)	(0.0)	(8.1)	(8.3)	(18.3)	(36.0)	(11.5)	37
Kano	18.1	423	(2.4)	(53.5)	(2.7)	(0.0)	(7.3)	(2.5)	(14.8)	(16.8)	(2.4)	76
Katsina	29.6	409	1.5	22.9	2.8	0.0	0.0	1.5	38.0	19.4	15.3	121
Kebbi	22.2	200	4.1	54.8	0.0	0.0	0.0	1.0	4.7	2.3	33.1	44
Sokoto	13.2	157	(8.3)	(6.9)	(2.8)	(0.0)	(16.6)	(13.8)	(21.5)	(5.5)	(24.7)	21
Zamfara	12.1	229	(19.0)	(21.4)	(12.5)	(15.8)	(7.8)	(14.3)	(0.0)	(3.0)	(6.3)	28
South East												
Abia	44.0	134	4.9	38.1	3.7	0.7	7.9	2.3	11.7	10.7	22.6	59
Anambra	43.8	234	13.4	44.5	0.0	0.0	5.9	1.6	12.6	17.8	5.6	103
Ebonyi	31.8	151	18.5	38.9	6.5	3.4	11.9	10.7	9.2	15.9	10.4	48
Enugu	37.1	165	26.8	45.3	0.0	0.0	4.9	5.5	1.6	13.2	2.7	61
Imo	44.4	192	6.5	52.7	7.8	0.0	4.0	2.6	13.3	10.3	3.9	85
South South												
Akwa Ibom	28.3	204	12.8	51.0	0.0	0.0	4.6	2.0	15.4	18.5	0.0	58
Bayelsa	27.1	120	9.9	23.9	17.0	3.1	17.0	1.3	10.4	10.5	14.8	32
Cross River	26.6	180	12.2	35.3	3.8	0.0	6.8	16.6	24.3	6.5	4.1	48
Delta	24.9	160	(20.9)	(34.8)	(3.6)	(0.0)	(10.5)	(3.7)	(19.2)	(4.7)	(4.5)	40
Edo	31.1	153	6.8	19.5	5.6	0.0	0.0	14.3	2.2	9.5	44.2	48
Rivers	39.7	337	3.3	31.6	0.0	0.0	10.1	1.3	35.1	5.1	15.9	134
South West												
Ekiti	41.9	138	15.2	57.2	11.9	2.3	14.7	2.6	0.0	3.5	8.5	58
Lagos	35.6	314	19.0	49.8	23.9	9.6	7.7	3.8	9.4	17.0	7.6	112
Ogun	31.3	172	11.2	56.7	0.0	1.9	18.2	2.3	0.0	11.1	5.0	54
Ondo	21.1	248	0.0	54.5	7.5	0.0	6.8	0.0	3.2	12.5	19.9	52
Osun	35.0	300	8.2	37.0	6.6	1.3	29.0	2.7	5.3	2.9	12.2	105
Oyo	19.1	396	(3.0)	(57.5)	(6.8)	(0.0)	(11.5)	(5.4)	(0.0)	(9.7)	(11.2)	76
Total	24.5	7,745	8.6	41.7	5.6	1.4	8.8	3.7	12.5	13.1	12.1	1,897

Notes: 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. Table is based on women who stayed in the household the night before the interview. Estimates for North East Zone do not include the rural areas of Borno State.

Net usage among the de facto household population

Information was collected for each net separately, by recording whether the net was used or not the night before the interview. For the nets that were used, a list of individuals who slept under each net was recorded. For nets that were not used, respondents were asked additional questions about why the specific net was not used the night before the interview to better understand why individuals do not use the nets to which they have access. Table 5.13.1 shows the percent distribution of reasons no one slept inside the net the night before the survey, by background characteristics. Multiple responses were recorded to allow for more than one reason cited by the respondent.

Forty percent of the 12,938 nets recorded in all the households were not used the night before the interview. The most common cited reason for why a net was not used was that the net was too hot (34 percent). Respondents said that 23 percent of nets were not needed the before the interview, 11 percent of nets were not used because there were no mosquitoes, and 6 percent of nets were difficult to hang. Four percent of nets were not used because the usual household member did not sleep in the dwelling the last night, and 4 percent of nets were too old or torn. There was no place to hang 4 percent of nets, 2 percent of nets were not available due to washing, 2 percent smelled bad, and 2 percent of nets were not used because the person felt constrained. One percent of nets were cited as too dirty to use.

Data by state are shown in Table 5.13.2.

Table 5.13.1 Reason for not using the specific net the night preceding the interview: National

Percent distribution of mosquito nets that were not slept inside the previous night, by the main reason for not using the net, according to background characteristics, Nigeria 2015

Background characteristic	Percentage of nets not slept inside last night	Total number of mosquito nets	Reason no one slept inside the net																Number of mosquito nets not slept inside last night
			No mosquitos	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	No space to hang	Other	Don't know	
Age																			
15-19	36.7	2,706	13.1	0.9	33.5	4.7	1.5	2.3	3.5	1.3	1.9	0.8	0.3	3.0	23.6	3.5	3.3	2.9	992
20-24	38.2	2,573	11.1	0.7	32.4	5.4	2.4	1.4	4.0	1.2	2.4	0.1	0.0	4.3	23.4	3.8	5.6	1.8	982
25-29	40.5	2,786	9.7	0.7	35.5	6.2	3.2	1.4	5.0	1.0	1.9	0.1	0.5	4.5	21.5	3.6	4.0	1.4	1,129
30-34	38.1	2,052	11.4	0.1	34.3	4.5	1.4	1.6	3.6	1.1	3.7	0.3	0.5	5.3	22.4	3.3	4.0	2.4	781
35-39	45.6	1,328	9.6	0.6	36.3	8.0	2.2	1.8	5.0	1.8	1.9	0.4	0.0	4.1	20.9	4.3	2.9	0.3	606
40-44	42.9	916	10.2	0.8	34.1	5.0	1.1	1.3	4.1	0.5	1.6	0.6	0.1	6.0	24.2	2.2	6.9	1.3	393
45-49	40.3	578	9.6	0.0	35.6	7.4	1.6	0.8	2.4	1.1	5.2	0.4	0.4	2.8	23.7	1.2	2.3	5.5	233
Residence																			
Urban	48.4	4,376	10.1	0.5	34.7	6.4	2.9	2.3	4.9	1.1	2.4	0.3	0.3	3.8	17.5	4.5	6.1	2.2	2,118
Rural	35.0	8,563	11.4	0.7	34.1	5.1	1.5	1.1	3.6	1.2	2.4	0.4	0.2	4.6	26.3	2.8	2.8	1.8	2,997
Zone																			
North Central	34.2	1,594	14.4	0.4	38.1	5.9	2.3	0.5	4.4	0.5	3.6	0.4	0.4	4.7	12.5	2.0	6.4	3.4	545
North East	26.6	1,754	11.4	0.3	39.3	2.3	1.1	1.1	5.3	2.4	8.3	0.1	0.1	2.3	19.7	2.5	2.8	1.0	466
North West	24.0	4,744	14.6	1.3	35.3	2.9	0.1	0.9	2.1	1.2	0.4	0.0	0.0	5.1	27.6	2.3	2.7	3.2	1,140
South East	67.9	1,382	8.3	0.5	33.9	5.9	0.6	2.7	3.3	0.3	1.2	0.7	0.3	7.4	22.1	5.6	5.6	1.4	938
South South	59.6	1,852	7.5	0.2	29.0	7.2	2.5	2.0	1.9	1.1	0.7	0.5	0.2	2.6	34.1	4.1	4.9	1.6	1,103
South West	57.3	1,613	10.6	0.5	35.2	8.6	5.9	1.8	9.3	1.8	4.5	0.3	0.6	2.9	10.9	3.2	3.1	0.9	924
Wealth quintile																			
Lowest	22.2	2,795	19.6	1.5	32.3	2.2	0.2	1.2	5.0	2.7	2.1	0.0	0.0	4.2	21.9	2.7	2.3	2.1	620
Second	28.5	2,577	9.4	0.4	37.0	3.6	0.4	0.4	4.2	1.2	2.6	0.3	0.0	4.7	28.5	2.1	4.3	1.0	736
Middle	37.3	2,686	8.8	0.3	29.7	6.7	1.9	1.3	5.1	0.9	3.1	0.2	0.3	5.7	26.3	3.6	2.8	3.4	1,000
Fourth	53.7	2,679	10.1	0.6	33.6	6.6	3.1	1.4	4.0	1.3	2.4	0.9	0.3	3.9	22.5	3.5	3.5	2.0	1,438
Highest	60.0	2,201	10.1	0.4	38.1	6.6	3.0	2.9	3.1	0.5	1.9	0.0	0.4	3.4	17.1	4.5	6.8	1.3	1,321
Total	39.5	12,938	10.9	0.6	34.3	5.7	2.1	1.6	4.1	1.2	2.4	0.3	0.3	4.3	22.6	3.5	4.2	1.9	5,116

Note: National estimates do not include the rural areas of Borno State.

Table 5.13.2 Reason for not using the net the night preceding the interview: States

Percent distribution of mosquito nets that were not slept inside the previous night, by the main reason for not using the net, according to state, Nigeria 2015

State	Percentage of nets not slept inside last night	Total number of mosquito nets	Reason no one slept inside the net																Number of mosquito nets not slept inside last night
			No mosquitos	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	No space to hang	Other	Don't know	
North Central																			
FCT-Abuja	42.5	43	38.9	0.0	29.8	6.8	0.0	1.5	1.1	0.0	0.0	0.0	0.0	0.0	9.1	1.1	6.2	5.5	18
Benue	30.9	249	23.2	0.4	19.9	7.7	5.5	0.0	6.0	0.0	7.3	0.0	2.6	12.0	12.8	0.0	2.5	0.0	77
Kogi	42.6	196	10.6	0.0	47.8	9.9	9.3	0.9	4.0	0.0	0.0	2.6	0.0	4.7	4.0	0.0	5.4	0.8	84
Kwara	38.5	134	60.1	3.8	2.3	3.9	0.0	0.0	11.5	0.0	12.6	0.0	0.0	1.9	0.0	2.0	1.9	0.0	51
Nasarawa	32.7	190	5.3	0.0	43.5	4.6	0.8	0.7	0.7	0.9	0.4	0.0	0.0	11.0	27.9	0.0	1.3	3.1	62
Niger	21.3	391	7.5	0.0	17.1	4.2	0.0	1.4	5.0	0.0	2.0	0.0	0.0	3.7	21.8	1.4	18.0	17.8	83
Plateau	43.3	392	2.5	0.0	61.7	5.0	0.0	0.0	3.2	1.4	3.4	0.0	0.0	0.9	10.4	5.1	6.3	0.0	170
North East																			
Adamawa	29.2	247	30.0	1.0	18.6	0.0	0.0	3.3	2.7	0.0	0.0	0.7	0.7	1.1	33.1	0.0	5.5	3.2	72
Bauchi	23.2	655	4.5	0.0	52.9	0.8	1.6	0.0	7.6	3.3	3.7	0.0	0.0	3.2	15.4	5.6	0.0	1.5	152
Borno - Urban	9.4	58	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5
Gombe	54.7	302	5.2	0.3	43.3	4.9	1.6	0.9	3.3	0.4	17.2	0.0	0.0	1.2	21.5	0.2	0.0	0.0	165
Taraba	23.9	122	13.4	0.0	26.1	3.3	0.0	3.9	11.7	1.6	4.8	0.0	0.0	9.0	15.8	2.2	8.0	0.0	29
Yobe	11.3	370	28.2	0.0	14.8	0.0	0.0	0.0	5.1	12.0	7.6	0.0	0.0	1.0	9.3	5.6	16.4	0.0	42
North West																			
Jigawa	16.3	840	5.6	0.8	23.5	0.0	0.0	0.0	1.1	1.0	0.0	0.0	0.3	3.3	58.7	4.4	0.9	0.4	137
Kaduna	12.1	720	7.2	2.3	19.5	10.0	0.0	1.1	3.4	0.0	3.4	0.0	0.0	5.3	3.5	2.9	13.0	28.3	87
Kano	30.7	885	18.2	0.8	36.9	0.0	0.0	1.4	2.8	2.0	0.0	0.0	0.0	0.7	35.2	1.4	0.8	0.0	272
Katsina	33.9	1,157	17.7	0.5	31.0	4.6	0.0	0.0	1.3	1.5	0.0	0.0	0.0	9.2	25.5	3.3	3.0	2.4	393
Kebbi	26.6	325	4.8	1.8	80.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	7.0	1.5	0.0	1.5	86
Sokoto	15.2	201	(39.8)	(6.1)	(27.7)	(2.2)	(0.0)	(2.2)	(7.4)	(1.6)	(0.0)	(0.0)	(0.0)	(3.7)	(0.0)	(0.0)	(9.4)	(0.0)	31
Zamfara	21.9	616	12.8	3.5	39.8	3.4	0.8	4.0	3.4	0.6	1.3	0.0	0.0	6.0	22.3	0.0	1.2	0.8	135
South East																			
Abia	79.5	175	13.1	3.6	48.6	4.4	1.3	1.2	3.2	0.0	0.0	0.7	1.8	1.0	15.6	2.2	2.8	0.4	139
Anambra	70.4	408	4.8	0.0	27.0	7.5	0.0	0.6	1.8	1.0	0.0	0.5	0.0	15.0	19.5	6.5	14.3	1.5	287
Ebonyi	54.9	421	6.4	0.0	14.5	1.6	0.7	8.4	1.3	0.0	2.7	0.0	0.0	6.2	46.1	8.7	1.9	1.5	231
Enugu	64.7	149	14.6	0.0	44.1	15.6	0.0	0.0	7.7	0.0	0.9	1.9	0.0	2.6	3.6	5.1	1.4	2.5	96
Imo	80.6	229	9.6	0.0	52.7	4.7	1.4	1.5	5.8	0.0	2.1	1.4	0.0	4.4	10.5	3.3	1.2	1.5	185
South South																			
Akwa Ibom	62.5	453	3.7	0.0	28.4	9.1	0.0	1.0	0.4	0.0	0.0	0.0	0.0	1.4	48.4	4.6	1.6	1.4	283
Bayelsa	64.8	135	17.4	1.3	29.2	3.1	2.5	1.3	8.1	2.6	0.0	3.2	0.0	6.2	9.8	3.8	9.1	2.3	87
Cross River	45.1	362	9.3	0.0	22.7	4.9	1.2	2.7	1.2	2.1	3.1	0.0	0.0	3.7	42.7	5.5	0.8	0.0	163
Delta	62.2	162	12.7	0.0	29.1	18.7	1.4	4.3	2.5	0.9	0.0	0.9	1.8	7.2	4.4	12.6	3.5	0.0	101
Edo	72.3	117	6.2	0.9	25.0	8.6	6.9	11.4	2.3	0.7	1.3	1.8	0.0	2.7	13.2	4.0	11.5	3.5	85
Rivers	61.7	623	6.2	0.0	32.9	4.3	4.1	0.0	1.6	1.3	0.5	0.0	0.0	1.0	38.0	1.0	6.9	2.3	384
South West																			
Ekiti	64.0	205	18.4	1.5	36.7	18.1	3.4	1.1	2.7	0.4	2.8	1.7	0.0	2.8	8.9	1.5	0.0	0.0	131
Lagos	67.8	255	10.7	0.0	37.5	10.2	11.4	3.8	3.8	0.0	0.8	0.0	1.7	6.4	1.6	5.7	5.5	0.8	173
Ogun	70.7	163	3.5	0.9	32.7	10.4	0.0	2.7	4.2	1.9	0.8	0.0	0.0	1.7	31.3	1.2	8.6	0.0	115
Ondo	47.9	176	14.0	0.0	45.8	4.1	10.3	3.3	9.3	0.0	1.5	0.0	0.0	3.0	7.3	0.0	1.5	0.0	84
Osun	67.5	379	12.3	0.5	31.6	7.0	6.5	1.0	11.0	2.7	4.7	0.0	0.0	0.0	13.0	4.6	2.4	2.8	256
Oyo	37.7	434	4.8	0.0	33.6	3.1	2.9	0.0	21.5	4.2	13.5	0.5	1.8	4.5	5.8	2.8	1.1	0.0	164
Total	39.5	12,938	10.9	0.6	34.3	5.7	2.1	1.6	4.1	1.2	2.4	0.3	0.3	4.3	22.6	3.5	4.2	1.9	5,116

Notes: Estimates for North East Zone do not include the rural areas of Borno State. 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.

5.4.3 Net Preferences among Women

Women were asked about their preferences for mosquito net shape, colour, and size, as shown in Table 5.14.1. Overall, the preferred net shape among women age 15-49 is conical (76 percent), compared with rectangular (12 percent). Almost half of women (47 percent) prefer white nets, and 24 percent like light blue nets. Ten percent of women prefer green nets, and 6 percent like dark blue.

When it comes to the size of the mosquito net, 73 percent of women prefer a double-sized net, 9 percent prefer a triple-sized net, and 8 percent prefer a single-sized net.

Eleven percent of women have no preferred shape, colour, or size for a mosquito net. Differences vary widely by background characteristics. Table 5.14.2 presents net preference data at the state level.

Table 5.14.1 Net preferences among women: National

Percent distribution of women age 15-49 by preferences for mosquito net shape, ,colour, and size, according to background characteristics, Nigeria 2015

Background characteristic	Shape				Colour								Size						Number of women
	Rectangle	Conical	Other	Don't know/ no preference	Green	Dark blue	Light blue	Red	Black	White	Other	Don't know/ no preference	Cot/crib	Single	Double	Triple	Other	Don't know/ no preference	
Age																			
15-19	14.2	74.8	0.1	10.9	8.9	4.1	22.6	1.1	0.1	51.4	2.0	9.7	0.1	11.6	71.1	5.6	0.0	11.5	617
20-24	12.9	74.1	0.5	12.5	8.7	6.5	25.3	0.6	0.3	45.9	2.2	10.5	0.2	10.3	70.4	6.4	0.0	12.7	647
25-29	13.4	74.6	0.5	11.5	10.1	6.3	22.2	0.5	0.2	48.1	1.2	11.5	0.4	7.8	72.2	9.3	0.1	10.1	727
30-34	10.6	78.5	0.1	10.7	9.0	7.1	25.3	0.1	0.3	45.6	0.8	11.6	0.1	5.7	72.2	10.9	0.4	10.7	603
35-39	10.0	79.7	0.0	10.3	10.4	8.5	26.4	0.1	0.3	43.0	0.9	10.4	0.1	7.8	75.4	8.5	0.0	8.2	447
40-44	9.7	78.4	0.0	11.9	12.0	5.4	23.2	0.3	0.4	44.5	0.5	13.7	0.0	4.4	73.9	11.8	0.0	9.9	358
45-49	14.9	73.5	0.0	11.7	12.6	4.1	26.4	0.0	0.4	42.5	0.9	13.1	0.6	4.1	76.6	11.0	0.0	7.7	224
Residence																			
Urban	13.7	75.8	0.1	10.4	5.2	6.5	24.7	0.6	0.3	51.2	1.7	9.9	0.0	9.5	72.4	8.2	0.1	9.7	1,764
Rural	11.0	76.4	0.3	12.3	14.3	5.8	23.8	0.4	0.3	42.1	0.9	12.5	0.3	6.5	72.6	9.2	0.1	11.3	1,860
Zone																			
North Central	8.9	75.2	0.4	15.5	9.4	7.9	18.3	0.4	0.4	47.4	1.1	15.1	0.2	4.4	67.7	14.5	0.0	13.2	622
North East	19.8	75.5	0.5	4.2	17.9	9.7	20.2	2.3	0.1	43.6	1.1	5.1	0.2	4.7	85.6	5.8	0.5	3.3	323
North West	18.5	69.0	0.3	12.1	13.7	2.1	20.1	0.0	0.4	51.5	0.3	11.9	0.5	10.6	69.7	5.9	0.1	13.2	619
South East	7.0	83.2	0.0	9.7	12.6	7.1	32.9	0.5	0.4	34.5	1.3	10.8	0.0	8.6	74.6	8.3	0.1	8.4	586
South South	12.2	76.9	0.4	10.6	10.1	5.0	26.9	0.3	0.2	43.8	1.9	11.7	0.4	6.0	76.0	7.1	0.0	10.4	635
South West	11.1	76.8	0.0	12.2	2.2	6.6	25.1	0.3	0.1	53.9	1.8	10.1	0.0	11.0	69.1	9.0	0.0	10.9	838
Education																			
No education	11.4	74.1	0.4	14.1	16.2	5.8	19.4	0.2	0.4	42.9	0.4	14.6	0.4	8.3	70.6	6.6	0.2	13.8	887
Primary	8.3	79.1	0.0	12.6	10.5	8.5	21.5	0.4	0.5	44.3	1.2	13.1	0.0	4.5	75.3	8.3	0.1	11.7	547
Secondary	11.6	77.6	0.0	10.7	7.3	5.4	27.5	0.5	0.1	47.4	1.5	10.2	0.2	9.0	72.4	9.0	0.0	9.5	1,653
More than secondary	19.9	71.8	0.8	7.5	6.5	6.5	25.0	0.8	0.1	52.2	2.3	6.7	0.2	8.0	73.4	11.5	0.0	6.9	537
Wealth quintile																			
Lowest	8.3	76.4	1.1	14.2	19.5	8.0	15.7	0.4	0.2	42.4	0.7	13.1	0.8	9.3	69.1	5.9	0.4	14.5	350
Second	9.7	78.1	0.0	12.1	16.6	7.5	24.6	0.7	0.4	36.4	0.1	13.7	0.0	7.9	73.3	6.4	0.0	12.4	448
Middle	9.7	76.7	0.1	13.5	10.8	5.2	24.9	0.3	0.8	44.1	0.8	13.1	0.3	5.6	73.0	10.5	0.1	10.5	624
Fourth	11.7	78.1	0.2	10.0	9.5	5.1	24.3	0.4	0.1	47.8	1.0	11.9	0.2	7.4	74.3	8.6	0.0	9.6	965
Highest	16.1	73.5	0.2	10.3	4.5	6.4	26.1	0.5	0.1	51.6	2.5	8.3	0.0	9.4	71.6	9.5	0.1	9.5	1,237
Total	12.3	76.1	0.2	11.4	9.9	6.1	24.2	0.5	0.3	46.5	1.3	11.2	0.2	8.0	72.5	8.7	0.1	10.5	3,624

Note: National estimates do not include the rural areas of Borno State.

Table 5.14.2 Net preferences among women: States

Percent distribution of women age 15-49 by preferences for mosquito net shape, colour, and size, by state, Nigeria 2015

	Shape				Colour								Size						
State	Rectangle	Conical	Other	Don't know/ no prefer-ence	Green	Dark blue	Light blue	Red	Black	White	Other	Don't know/ no prefer-ence	Cot/crib	Single	Double	Triple	Other	Don't know/ no prefer-ence	Number of women
North Central																			
FCT-Abuja	17.8	74.4	0.0	7.8	1.8	2.8	19.6	0.0	0.0	58.0	6.4	11.4	0.0	5.2	90.9	0.0	0.0	3.9	28
Benue	2.5	65.1	0.0	32.4	4.7	1.8	33.4	0.0	0.0	41.3	0.0	18.8	0.0	2.5	58.4	16.2	0.0	22.9	143
Kogi	19.4	80.0	0.0	0.6	7.4	2.5	19.8	1.1	0.0	59.4	0.6	9.2	0.9	0.0	62.4	35.2	0.0	1.5	126
Kwara	6.0	91.4	0.0	2.6	10.5	9.7	14.5	0.0	2.3	56.8	2.5	3.5	0.0	13.9	81.0	1.1	0.0	3.9	88
Nasarawa	15.1	76.2	0.0	8.7	4.2	18.0	15.5	0.0	0.8	36.8	4.2	20.4	0.0	5.2	68.4	18.5	0.0	7.9	52
Niger	5.0	57.0	2.3	35.8	0.0	8.3	13.1	0.0	0.0	43.9	0.0	34.6	0.0	6.9	45.6	10.9	0.0	36.5	104
Plateau	4.9	90.9	0.0	4.1	37.8	19.7	1.5	1.0	0.0	36.8	0.0	3.3	0.0	0.0	98.1	1.0	0.0	0.9	81
North East																			
Adamawa	11.6	77.0	0.0	11.4	17.8	8.0	22.1	2.1	0.0	34.3	1.1	14.6	0.0	7.8	82.8	0.0	0.0	9.4	70
Bauchi	17.6	80.3	0.0	2.1	15.1	11.2	22.7	0.0	0.0	49.2	0.0	1.7	0.0	1.7	84.0	14.3	0.0	0.0	57
Borno - Urban	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	14
Gombe	56.1	40.6	0.0	3.3	7.2	4.2	21.8	0.0	0.0	61.4	0.0	5.3	0.0	4.5	89.0	1.5	0.0	5.0	56
Taraba	15.2	83.9	0.0	0.9	21.9	18.6	17.7	5.4	0.5	34.5	0.0	1.4	0.0	2.6	85.9	10.7	0.0	0.9	87
Yobe	2.4	92.2	3.9	1.5	34.7	0.0	16.8	3.1	0.0	40.0	3.9	1.5	1.5	9.7	84.9	0.0	3.9	0.0	39
North West																			
Jigawa	(11.5)	(78.6)	(3.6)	(6.3)	(11.6)	(0.0)	(39.4)	(0.0)	(0.0)	(43.5)	(0.0)	(5.5)	(3.6)	(10.5)	(66.3)	(14.2)	(0.0)	(5.5)	60
Kaduna	(23.4)	(62.6)	(0.0)	(14.1)	(17.9)	(0.0)	(37.7)	(0.0)	(0.0)	(30.9)	(0.0)	(13.4)	(0.0)	(5.5)	(50.8)	(35.9)	(0.0)	(7.8)	53
Kano	21.1	53.9	0.0	25.0	8.1	1.0	8.0	0.0	0.0	59.5	1.2	22.3	0.0	3.1	68.0	2.0	0.0	26.9	183
Kebbi	16.2	82.4	0.0	1.4	0.0	1.1	16.3	0.0	2.8	79.8	0.0	0.0	1.2	17.4	81.4	0.0	0.0	0.0	56
Sokoto	35.6	63.1	0.0	1.2	31.7	7.9	5.5	0.0	1.4	52.3	0.0	1.2	0.0	61.0	32.8	3.9	1.2	1.1	53
Zamfara	(35.0)	(65.0)	(0.0)	(0.0)	(25.5)	(11.1)	(37.2)	(0.0)	(0.0)	(23.3)	(0.0)	(2.9)	(0.0)	(17.4)	(70.3)	(12.4)	(0.0)	(0.0)	28
South East																			
Abia	12.6	77.2	0.0	10.2	16.4	7.8	31.3	0.0	0.0	33.7	0.0	10.8	0.0	16.0	74.8	0.9	0.0	8.4	101
Anambra	7.3	77.0	0.0	15.7	4.2	9.1	29.6	0.0	0.0	40.4	1.3	15.4	0.0	16.4	63.8	7.4	0.0	12.4	129
Ebonyi	6.8	76.2	0.0	17.0	3.8	8.5	24.7	3.5	2.3	37.1	1.6	18.5	0.0	4.8	78.1	0.0	0.9	16.2	66
Enugu	1.1	95.3	0.0	3.6	9.8	6.8	49.2	0.4	0.7	25.1	0.0	8.0	0.0	0.7	95.0	2.9	0.0	1.4	130
Imo	8.2	85.2	0.0	6.6	22.8	4.8	26.6	0.0	0.0	36.6	3.0	6.2	0.0	5.8	65.1	21.5	0.0	7.6	160
South South																			
Akwa Ibom	13.3	79.3	1.3	6.2	4.4	0.2	37.7	0.0	0.0	51.2	1.6	4.9	0.0	5.4	75.4	9.4	0.2	9.6	93
Bayelsa	13.0	78.8	0.5	7.7	6.2	4.6	30.6	0.0	0.7	53.6	0.7	3.6	2.6	1.8	72.9	18.0	0.0	4.6	92
Cross River	18.0	78.6	0.0	3.4	0.0	4.4	22.4	0.6	0.0	62.0	4.1	6.6	0.0	9.8	73.1	13.4	0.0	3.7	52
Delta	11.5	76.4	0.6	11.6	6.0	18.3	13.1	0.0	0.0	38.9	1.0	22.7	0.0	5.1	79.2	5.9	0.0	9.8	95
Edo	8.5	67.6	0.0	23.9	2.6	6.5	25.9	2.3	0.7	31.0	7.1	23.9	0.0	5.6	59.9	5.1	0.0	29.5	75
Rivers	11.5	78.0	0.0	10.5	20.6	1.3	28.0	0.0	0.0	39.0	0.7	10.4	0.0	7.7	82.2	1.5	0.0	8.6	227
South West																			
Ekiti	6.7	60.2	0.0	33.1	4.5	2.2	22.8	1.0	1.1	34.4	0.0	34.1	0.0	9.4	49.8	10.3	0.0	30.4	58
Lagos	17.6	71.0	0.0	11.4	1.0	14.2	19.7	0.4	0.0	51.8	5.5	7.3	0.0	2.1	83.3	2.5	0.0	12.1	249
Ogun	20.7	75.4	0.0	3.9	0.0	2.2	35.3	0.7	0.0	57.7	1.3	2.8	0.0	0.8	78.0	21.2	0.0	0.0	109
Ondo	0.0	90.2	0.0	9.8	4.1	8.3	12.2	0.0	0.0	65.0	0.0	10.4	0.0	7.2	83.0	0.0	0.0	9.8	83
Osun	5.9	76.5	0.0	17.6	0.0	1.7	19.7	0.0	0.0	60.1	0.0	18.5	0.0	3.2	77.0	3.3	0.0	16.4	167
Oyo	7.4	85.4	0.0	7.2	5.6	3.6	38.8	0.0	0.0	49.5	0.0	2.5	0.0	40.2	35.0	20.2	0.0	4.7	172
Total	12.3	76.1	0.2	11.4	9.9	6.1	24.2	0.5	0.3	46.5	1.3	11.2	0.2	8.0	72.5	8.7	0.1	10.5	3,624

Notes: Estimates for North East Zone do not include the rural areas of Borno State. 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.

5.5 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

To reduce the risks of malaria during pregnancy, the updated guidelines of the National Malaria Elimination Programme stipulates that all pregnant women are to receive at least 3 doses of sulfadoxine-pyrimethamine (SP) medication. Women receive SP during their antenatal care visits under directly observed therapy. It is also possible that pregnant women obtain SP from sources outside of antenatal care visits.

The 2015 NMIS included questions about malaria prevention for women with a live birth in the 2 years preceding the survey. Specifically, women 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, they were further asked how many times they took it and whether they had received it during an antenatal care visit.

Table 5.15.1 shows at the national level the percentages of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy, took SP for intermittent preventive treatment of malaria during pregnancy (IPTp). In the 2015 NMIS, IPTp uptake of 3 or more doses was 19 percent. Figure 5.10 presents data for trends in IPTp between 2008 and 2015.

About two in five women (37 percent) report taking 2 or more doses of SP during the index pregnancy, an increase from 5 percent in the 2008 NDHS, 13 percent in the 2010 NMIS, and 15 percent in the 2013 NDHS.

Women in urban areas (24 percent) are more likely to receive 3 or more doses of SP than their rural counterparts (16 percent). The percentage of women who reported receiving 3 or more doses of IPTp ranges from 15 percent in the North West to 26 percent in the North East and the South East. Receipt of IPTp is associated with an increase in education, from 13 percent for uneducated women to 24 percent for women with a secondary or higher education. The same pattern is observed with regard to household wealth; 10 percent to 23 percent of women in the lowest wealth quintile received 3 or more SP doses compared with 26 percent of women in the fourth wealth quintile.

Table 5.15.2 presents data at the state level.

Table 5.15.1 Use of intermittent preventive treatment (IPTp) by women during pregnancy: National

Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy preceding the last birth, received 1 or more doses of SP during an ANC visit, received 2 or more doses of SP, at least one of which was received during an ANC visit, and received 3 or more doses of SP, at least 1 of which was received during an ANC visit, by background characteristics, Nigeria 2015

Background characteristic	Percentage who received only 1 dose of SP[1]	Percentage who received only 2 doses of SP[1]	Percentage who received 2 or more doses of SP[1]	Percentage who received 3 or more doses of SP[1]	Number of women with a live birth in the 2 years preceding the survey
Residence					
Urban	12.2	26.3	50.4	24.1	889
Rural	8.0	13.8	30.0	16.2	1,633
Zone					
North Central	8.5	10.4	28.4	18.0	441
North East	9.0	17.5	43.5	26.0	350
North West	10.8	13.3	28.7	15.4	815
South East	7.8	16.6	42.5	26.0	225
South South	7.5	23.5	39.3	15.8	282
South West	10.3	34.2	53.7	19.5	409
Education					
No education	7.8	11.8	25.1	13.3	1,107
Primary	12.8	17.6	36.2	18.6	402
Secondary	9.9	25.1	50.7	25.6	809
More than secondary	9.7	27.0	51.2	24.2	203
Wealth quintile					
Lowest	5.4	11.0	20.9	9.9	488
Second	7.6	9.8	26.7	16.9	598
Middle	12.8	18.2	38.2	20.0	463
Fourth	12.5	21.1	47.4	26.3	468
Highest	9.6	32.3	54.8	22.5	506
Total	9.4	18.2	37.2	19.0	2,522

Note: Estimates for North East Zone do not include the rural areas of Borno State.
[1] Received the specified number of doses of SP, at least one of which was received during an ANC visit.

Table 5.15.2 Use of intermittent preventive treatment (IPTp) by women during pregnancy: States

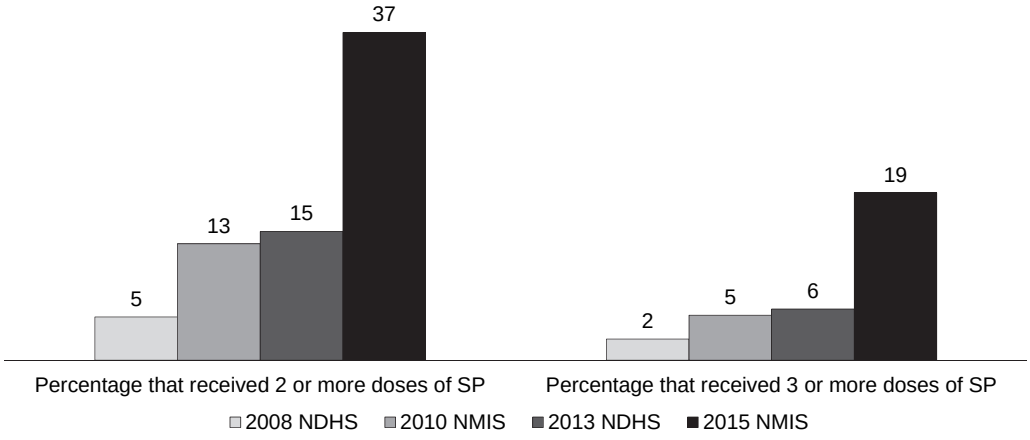
Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy preceding the last birth, received 1 or more doses of SP during an ANC visit, received 2 or more doses of SP, at least one of which was received during an ANC visit, and received 3 or more doses of SP, at least 1 of which was received during an ANC visit, by state, Nigeria 2015

State	Percentage who received only 1 dose of SP[1]	Percentage who received only 2 doses of SP[1]	Percentage who received 2 or more doses of SP[1]	Percentage who received 3 or more doses of SP[1]	Number of women with a live birth in the 2 years preceding the survey
North Central					
FCT-Abuja	(2.5)	(25.1)	(60.7)	(35.6)	11
Benue	5.6	15.9	36.8	21.0	81
Kogi	9.2	20.2	58.5	38.3	59
Kwara	3.5	5.2	20.0	14.9	63
Nasarawa	11.0	15.7	33.3	17.6	47
Niger	0.0	1.4	9.5	8.1	83
Plateau	20.4	7.0	19.0	12.0	98
North East					
Adamawa	7.0	9.6	31.3	21.6	57
Bauchi	14.6	23.3	41.7	18.3	108
Borno - Urban	(8.4)	(31.4)	(76.5)	(45.2)	14
Gombe	8.9	13.1	50.8	37.7	49
Taraba	4.2	6.3	26.8	20.5	60
Yobe	5.7	25.5	60.4	34.9	62
North West					
Jigawa	6.0	20.9	29.1	8.2	121
Kaduna	22.9	4.8	20.9	16.1	116
Kano	16.8	19.7	25.6	5.9	162
Katsina	9.5	9.9	33.9	24.0	230
Kebbi	1.2	4.6	32.2	27.6	54
Sokoto	4.2	11.8	28.0	16.2	52
Zamfara	3.1	17.6	28.4	10.8	80
South East					
Abia	(6.4)	(11.8)	(36.0)	(24.2)	26
Anambra	(9.8)	(22.7)	(42.9)	(20.2)	60
Ebonyi	15.3	2.8	43.8	41.0	54
Enugu	2.4	6.0	41.9	35.9	39
Imo	(2.1)	(36.3)	(44.8)	(8.5)	46
South South					
Akwa Ibom	(15.5)	(14.6)	(26.1)	(11.6)	40
Bayelsa	1.2	19.3	28.0	8.7	43
Cross River	(8.4)	(24.4)	(55.5)	(31.2)	37
Delta	10.7	10.0	13.7	3.7	51
Edo	(0.0)	(39.1)	(75.0)	(35.9)	25
Rivers	6.6	33.0	49.2	16.3	86
South West					
Ekiti	7.5	13.7	59.1	45.4	32
Lagos	4.2	60.9	70.5	9.6	122
Ogun	12.9	33.9	53.0	19.1	52
Ondo	17.3	26.4	35.6	9.2	54
Osun	10.0	18.5	30.6	12.1	70
Oyo	(14.6)	(20.9)	(59.1)	(38.2)	79
Total	9.4	18.2	37.2	19.0	2,522

Notes: Estimates for North East Zone do not include the rural areas of Borno State. Figures in parentheses are based on 25-49 unweighted cases.

[1] Received the specified number of doses of SP, at least one of which was received during an ANC visit

Figure 5.10 **Trends in intermittent preventive treatment for pregnant women (IPTp)**



ANAEMIA AND MALARIA IN CHILDREN 6

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. Human cells depend on oxygen for survival, so anaemia in children can have severe health consequences, including impaired cognitive and motor development, stunted growth, and increased morbidity from infectious diseases. There are several types of anaemia, which are caused by a variety of underlying conditions. Inadequate intake of iron, folate, vitamin B12, or other nutrients account for the majority of cases of anaemia in many populations. Other causes of anaemia include thalassemia, sickle cell disease, and intestinal worms. However, in malaria endemic areas, malaria accounts for a significant proportion of anaemia in children under age 5. Becauses 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 6 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 2015 NMIS were eligible for haemoglobin and malaria testing. The battery-operated portable HemoCue® analyser was used to measure the concentration of haemoglobin in the blood. The SD Bioline Malaria Ag *P.f* (HRP-II) ™ rapid diagnostic test (RDT) for detection of histidine rich protein-2 (HRP2), manufactured by Standard Diagnostics, Inc., South Korea, was used to detect malaria. Thick blood smears and thin blood films were made in the field and transported to the laboratory, where microscopy was performed to determine the presence of malaria parasites and to identify the parasite species.

Tables 6.1.1 and 6.1.2 show the total number of children age 6-59 months eligible for testing and the percentages actually tested for anaemia and malaria at the national and state levels. Of the 6,316 children, eligible for testing, 95 percent were tested for anaemia using the battery-operated portable HemoCue analyser, 95 percent were tested for malaria using the rapid diagnostic test, and blood smears were collected for malaria diagnosis using microscopy for 91 percent of children. The coverage levels were uniformly high across most of the population. Testing coverage was somewhat lower among children age 6-8 months (89 percent for anaemia and RDT testing). Among the states, Borno (urban areas only), Anambra, and Sokoto had the lowest testing coverage (70, 86, and 87 percent, respectively).

Table 6.1.1 Coverage of testing for anaemia and malaria in children (unweighted): National

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria by background characteristics, Nigeria 2015

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children
Age in months				
6-11	91.5	91.4	88.5	637
6-8	89.3	89.3	85.9	355
9-11	94.3	94.0	91.8	282
12-17	96.8	96.9	93.4	740
18-23	94.7	94.7	91.7	640
24-35	95.0	94.9	91.9	1,352
36-47	95.4	95.2	89.8	1,485
48-59	95.8	95.9	90.0	1,462
Sex				
Male	95.0	94.9	90.6	3,192
Female	95.3	95.2	90.9	3,124
Mother's interview status				
Interviewed	95.5	95.4	91.3	5,540
Not interviewed[1]	92.5	92.4	87.1	776
Residence				
Urban	93.9	93.9	91.2	2,167
Rural	95.7	95.6	90.6	4,149
Zone				
North Central	95.6	95.5	92.3	1,252
North East	94.4	94.0	91.1	1,230
North West	94.8	94.7	89.5	1,586
South East	94.0	94.4	90.1	629
South South	96.1	96.0	92.1	800
South West	96.0	96.1	89.5	819
Mother's education[2]				
No education	95.3	95.2	90.5	2,419
Primary	97.1	97.1	92.4	998
Secondary	95.5	95.5	92.0	1,685
More than secondary	92.7	92.5	90.2	438
Wealth quintile				
Lowest	93.8	93.7	89.7	1,164
Second	96.2	96.1	90.2	1,381
Middle	96.9	96.8	91.7	1,292
Fourth	94.3	94.4	90.1	1,318
Highest	94.1	93.9	92.3	1,161
Total	95.1	95.0	90.8	6,316

Note: Estimates for North East Zone do not include the rural areas in Borno State.
RDT = Rapid DiagnosticTest
[1] Includes children whose mothers are deceased.
[2] Excludes children whose mothers were not interviewed.

Table 6.1.2 Coverage of testing for anaemia and malaria in children (unweighted): States

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria by state, Nigeria 2015

State	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children
North Central				
FCT-Abuja	92.7	92.7	92.7	110
Benue	97.0	97.0	97.0	164
Kogi	97.7	97.7	90.9	176
Kwara	91.9	91.1	83.7	135
Nasarawa	97.9	97.9	95.7	234
Niger	92.9	92.9	88.9	198
Plateau	96.6	96.6	94.0	235
North East				
Adamawa	94.7	92.9	91.6	226
Bauchi	96.1	95.7	91.8	257
Borno (urban)	69.7	69.7	68.2	66
Gombe	88.6	88.6	83.4	211
Taraba	98.6	98.6	95.9	220
Yobe	100.0	100.0	98.4	250
North West				
Jigawa	98.5	98.5	94.7	266
Kaduna	96.7	96.7	93.5	214
Kano	92.8	92.3	81.8	209
Katsina	93.5	93.5	88.2	263
Kebbi	95.3	95.3	89.1	192
Sokoto	87.0	87.0	81.2	239
Zamfara	100.0	100.0	98.5	203
South East				
Abia	89.7	91.5	79.5	117
Anambra	86.0	86.0	86.0	107
Ebonyi	98.3	98.9	95.4	175
Enugu	95.9	95.9	95.1	123
Imo	97.2	97.2	91.6	107
South South				
Akwa Ibom	100.0	100.0	95.3	106
Bayelsa	96.3	96.3	89.4	216
Cross River	97.4	97.4	91.4	116
Delta	95.0	94.3	94.3	140
Edo	96.7	96.7	92.3	91
Rivers	92.4	92.4	92.4	131
South West				
Ekiti	90.8	90.8	88.5	130
Lagos	98.4	98.4	100.0	190
Ogun	97.1	97.1	86.0	136
Ondo	95.1	95.1	85.2	122
Osun	93.5	93.5	80.4	107
Oyo	99.3	100.0	90.3	134
Total	95.1	95.0	90.8	6,316

Note: Estimates for North East Zone do not include the rural areas in Borno State.
RDT = Rapid Diagnostic Test

6.1 ANAEMIA PREVALENCE AMONG CHILDREN

Tables 6.2.1 and 6.2.2 show the percentage of children age 6-59 months with haemoglobin (Hb) lower than 11.0 grams per decilitre (g/dL), by background characteristics at the national and state levels, respectively. The WHO has recommended specific Hb levels below which a child is specified as having anaemia. Children 6-59 months old are considered anaemic if Hb concentration levels are below 11.0 g/dL; those age 5-11 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).

Tables 6.2.1 and 6.2.2 show the percentage of children age 6-59 months classified as having mild, moderate, and severe anaemia, by background characteristics at the national and state levels, respectively.[1] The results of the 2015 NMIS show that 68 percent of Nigerian children age 6-59 months are anaemic (Hb concentration levels are below 11.0 g/dL). Twenty-five percent are mildly anaemic (Hb levels of 10.0-10.9 g/dL), 34 percent are moderately anaemic (Hb levels of 8.0-9.9 g/dL), and 9 percent are severely anaemic (Hb levels below 8.0 g/dL). Based on these findings, anaemia appears to be a significant public health problem in Nigeria.[2]

Table 6.2.1 Prevalence of anaemia in children: National

Percentage of children age 6-59 months classified as having anaemia, by background characteristics, Nigeria 2015

Background characteristic	Mild (10.0-10.9 g/dL)	Moderate (8.0-9.9 g/dL)	Severe (< 8.0 g/dL)	Any anaemia (below 11.0 g/dL)	Number of children
Age (in months)					
6-11	26.8	38.8	10.5	76.2	605
6-8	29.1	36.9	6.6	72.6	331
9-11	24.1	41.2	15.2	80.5	274
12-17	24.4	41.8	12.4	78.5	698
18-23	27.8	36.4	12.3	76.4	607
24-35	26.0	32.1	11.5	69.6	1,284
36-47	23.9	31.8	8.2	63.9	1,437
48-59	24.7	30.3	5.3	60.3	1,423
Sex					
Male	24.5	36.1	9.7	70.4	3,075
Female	26.0	31.4	9.0	66.5	2,980
Mother's interview status					
Interviewed	25.3	33.6	9.6	68.6	5,347
Not interviewed[1]	24.9	35.4	7.2	67.4	708
Residence					
Urban	25.8	24.7	4.7	55.2	2,028
Rural	25.0	38.4	11.7	75.1	4,027
Zone					
North Central	27.8	32.1	4.5	64.4	1,135
North East	26.2	29.5	7.2	63.0	829
North West	20.1	43.2	17.7	80.9	1,953
South East	28.4	23.2	5.4	57.0	514
South South	31.1	32.9	5.5	69.5	669
South West	26.4	26.9	4.7	58.0	955
Mother's education[1]					
No education	23.0	40.1	14.8	77.9	2,423
Primary	26.4	35.9	7.0	69.2	946
Secondary	27.9	26.4	5.6	59.8	1,566
More than secondary	26.9	18.1	0.6	45.6	411
Wealth quintile					
Lowest	22.4	41.5	17.0	80.9	1,244
Second	21.6	41.5	13.3	76.3	1,406
Middle	28.2	35.3	8.0	71.4	1,172
Fourth	28.0	28.6	4.8	61.4	1,110
Highest	27.3	19.4	1.9	48.6	1,123
Total	25.3	33.8	9.3	68.4	6,055

Notes: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on haemoglobin levels and is adjusted for altitude using CDC formulas (CDC 1998). Haemoglobin is measured in grams per decilitre (g/dL).Estimates for North East Zone do not include the rural areas of Borno State.
[1] Excludes children whose mothers were not interviewed

The prevalence of severe anaemia is highest among children age 9-11 months (15 percent), male children (10 percent), children living in rural areas (12 percent), and children living in North West (18 percent). Children in rural areas are twice as likely as children in urban areas to have anaemia. 12 percent compared with

[1] Given that haemoglobin requirements differ substantially depending on altitude, anaemia data are 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).

5 percent, respectively. Severe anaemia is highest in Zamfara and Kano states (21 to 26 percent, respectively). The percentage of children with severe anaemia decreases with an increase in mother's education, from 15 percent among children whose mothers are uneducated to 1 percent among children whose mothers have more than a secondary education. Severe anaemia is inversely associated with wealth; the percentages decrease from 17 percent among children in the households in the lowest wealth quintile to 2 percent of children in households in the highest wealth quintile.

Table 6.2.2 Prevalence of anaemia in children: States

Percentage of children age 6-59 months classified as having anaemia, by state, Nigeria 2015

State	Mild (10.0-10.9 g/dL)	Moderate (8.0-9.9 g/dL)	Severe (< 8.0 g/dL)	Any anaemia (below 11.0 g/dL)	Number of children
North Central					
FCT-Abuja	26.8	32.6	9.0	68.4	26
Benue	40.4	24.5	1.6	66.5	246
Kogi	23.7	32.2	5.1	61.0	143
Kwara	23.4	29.5	5.4	58.3	123
Nasarawa	20.8	35.3	6.5	62.7	108
Niger	26.2	42.2	0.6	68.9	265
Plateau	24.5	28.1	10.2	62.8	224
North East					
Adamawa	29.8	26.5	11.4	67.8	142
Bauchi	24.5	30.4	6.9	61.8	254
Borno (urban)	(22.5)	(14.2)	(1.6)	(38.4)	20
Gombe	22.9	24.2	5.6	52.8	105
Taraba	23.8	38.6	8.2	70.6	130
Yobe	30.1	28.7	5.3	64.0	178
North West					
Jigawa	28.0	40.2	17.1	85.3	336
Kaduna	23.3	40.9	14.3	78.5	250
Kano	16.3	40.6	25.8	82.6	378
Katsina	18.9	39.1	16.1	74.2	463
Kebbi	17.0	63.7	3.7	84.4	167
Sokoto	21.4	38.6	19.4	79.3	154
Zamfara	14.2	51.3	21.4	86.8	206
South East					
Abia	27.8	21.4	1.4	50.6	63
Anambra	31.2	11.5	6.0	48.7	127
Ebonyi	23.5	42.5	7.9	73.8	131
Enugu	34.0	15.4	4.7	54.1	89
Imo	26.8	21.1	4.4	52.3	105
South South					
Akwa Ibom	32.9	36.4	4.1	73.3	106
Bayelsa	31.8	38.9	5.5	76.2	109
Cross River	23.9	47.8	7.2	78.9	90
Delta	26.7	28.1	4.6	59.4	117
Edo	28.8	27.5	8.2	64.4	60
Rivers	36.5	25.0	5.2	66.7	187
South West					
Ekiti	26.8	24.4	6.5	57.6	75
Lagos	25.8	20.6	2.1	48.4	270
Ogun	19.3	35.1	3.9	58.3	101
Ondo	31.5	40.9	0.0	72.4	129
Osun	26.5	22.2	10.5	59.1	138
Oyo	27.0	26.8	6.4	60.2	242
Total	25.3	33.8	9.3	68.4	6,055

Notes: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on haemoglobin levels and is adjusted for altitude using CDC formulas (CDC 1998). Haemoglobin is measured in grams per decilitre (g/dL). Estimates for North East Zone do not include the rural areas of Borno State.

Prevalence of any anaemia is highest among children age 9-11 months (81 percent), male children (70 percent), and children living in rural areas (75 percent). The proportion of children with any anaemia ranges from 57 percent in South East to 81 percent in North West. Prevalence of any anaemia decreases with an increase in mother's education, from 78 percent among children of uneducated mothers to 46 percent among children of

mothers with more than secondary education. Moreover, the prevalence of any anaemia decreases with wealth from 81 percent among children in the poorest households to 48 percent among children in the richest households. The proportion of children with any anaemia is highest in Zamfara State (87 percent) and lowest in urban areas in Borno-urban (39 percent) and Anambra State (48 percent).

6.2 MALARIA PREVALENCE AMONG CHILDREN

Malaria prevalence among children age 6-59 months was measured in the 2015 NMIS with RDTs in the field and by microscopy diagnosis in the laboratory. In the field, laboratory scientists used the SD Bioline Malaria Ag *P.f* (HRP-II) ™ 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 7 days first to one of seven zonal laboratories for staining and then to the main NMIS Laboratory at the Department of Medical Microbiology and Parasitology, Lagos University Teaching Hospital, Lagos State, for confirmatory microscopy diagnosis.

Tables 6.3.1 and 6.3.2 show the results of both types of malaria testing (RDT and microscopy) among children age 6-59 months, by background characteristics and at national and state levels. Data show that malaria prevalence is higher with RDTs than with microscopy (45 and 27 percent, respectively). 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 (Ajumobi et al, 2015; Wongsrichanalai et al. 2007).

Table 6.3.1 shows that 27 percent of children age 6-59 months tested positive for malaria when microscopy was used to detect the presence of parasites. 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. The percentage of children with malaria is much higher in rural than in urban areas. For example, malaria prevalence using microscopy is three times as high in rural areas as in urban areas (36 percent versus 12 percent). Among zones, the percentage of children with malaria ranges from 14 percent in South East to 37 percent in North West. Malaria prevalence decreases as the mother's education level and wealth quintile status increase.

Table 6.3.2 shows malaria prevalence in children by state. The percentage of children with malaria is highest in Kebbi State (64 percent) and Zamfara State (63 percent), and lowest in Kogi State (5 percent), Imo State (5 percent), and Lagos State and Borno State-urban where less than 1 percent of cases were observed. It is important to note that an observation of less than 1 percent malaria prevalence in Lagos and the urban areas of Borno within the 2015 NMIS should not be interpreted as Lagos and Borno-urban having no malaria cases; nor is Lagos a malaria-free state.

Table 6.3.1 Prevalence of malaria in children: National

Percentage of eligible children 6-59 months classified in two tests as having malaria, by background characteristics, Nigeria 2015

Background characteristic	Malaria prevalence according to RDT		Malaria prevalence according to microscopy	
	RDT positive	Number of children	Microscopy positive	Number of children
Age in months				
6-11	31.3	605	16.7	578
6-8	29.6	331	14.9	315
9-11	33.4	273	18.8	263
12-17	37.0	699	20.6	674
18-23	38.3	607	22.5	582
24-35	44.4	1,281	26.6	1,227
36-47	49.4	1,434	31.0	1,339
48-59	54.0	1,425	34.9	1,333
Sex				
Male	46.2	3,071	27.9	2,899
Female	43.9	2,979	26.9	2,834
Mother's interview status				
Interviewed	44.6	5,343	26.9	5,068
Not interviewed[1]	48.6	707	31.3	665
Residence				
Urban	24.2	2,029	11.5	1,933
Rural	55.7	4,021	35.6	3,800
Zone				
North Central	50.7	1,134	32.0	1,074
North East	42.8	824	25.9	789
North West	58.3	1,951	37.1	1,854
South East	31.7	516	13.7	499
South South	28.6	668	19.3	630
South West	32.1	957	16.6	888
Mother's education[2]				
No education	59.7	2,421	37.7	2,308
Primary	44.3	946	26.2	889
Secondary	29.9	1,566	16.7	1,482
More than secondary	12.5	410	3.6	389
Wealth quintile				
Lowest	64.1	1,242	42.9	1,199
Second	62.6	1,406	41.0	1,299
Middle	49.1	1,170	27.4	1,093
Fourth	30.1	1,111	16.8	1,062
Highest	12.6	1,121	4.4	1,080
Total	45.1	6,050	27.4	5,733

Note: Estimates for North East Zone do not include the rural areas of Borno State.
RDT = Rapid Diagnostic Test
[1] Includes children whose mothers are deceased
[2] Excludes children whose mothers were not interviewed

Table 6.3.2 Prevalence of malaria in children: States

Percentage of eligible children 6-59 months classified in two tests as having malaria, by state, Nigeria 2015

State	Malaria prevalence according to RDT		Malaria prevalence according to microscopy	
	RDT positive	Number of children	Microscopy positive	Number of children
North Central				
FCT-Abuja	38.5	26	20.2	25
Benue	55.3	246	44.5	230
Kogi	26.2	143	5.4	131
Kwara	49.7	122	26.4	121
Nasarawa	57.1	108	35.9	99
Niger	52.9	265	33.5	258
Plateau	57.6	224	35.8	210
North East				
Adamawa	55.5	139	34.7	135
Bauchi	41.1	253	19.6	238
Borno (urban)	(5.6)	20	(0.0)	32
Gombe	46.5	105	28.6	105
Taraba	53.4	130	42.9	119
Yobe	29.7	178	18.9	160
North West				
Jigawa	58.2	336	27.9	308
Kaduna	55.2	250	36.7	233
Kano	60.2	376	27.7	368
Katsina	54.2	463	27.8	445
Kebbi	48.9	167	63.6	157
Sokoto	66.0	154	46.6	157
Zamfara	69.9	206	62.6	185
South East				
Abia	21.1	64	8.2	64
Anambra	21.1	127	10.2	134
Ebonyi	51.1	131	30.0	120
Enugu	35.1	89	10.5	84
Imo	24.1	105	5.1	98
South South				
Akwa Ibom	27.7	106	22.8	95
Bayelsa	36.2	109	31.4	102
Cross River	40.7	90	26.1	82
Delta	24.7	116	20.4	111
Edo	35.0	60	18.6	56
Rivers	19.5	187	7.3	184
South West				
Ekiti	36.0	75	28.8	75
Lagos	1.9	270	0.0	246
Ogun	34.6	101	14.7	94
Ondo	48.1	129	21.3	121
Osun	54.6	138	33.4	133
Oyo	42.1	244	19.2	220
Total	45.1	6,050	27.4	5,733

Notes: Estimates for North East Zone do not include the rural areas of Borno State. Figures in parentheses are based on 25-49 unweighted cases.
RDT = Rapid Diagnostic Test

Figures 6.1 and 6.2 present trend data for malaria prevalence in children 6-59 months from the 2010 and 2015 NMIS surveys. Figure 6.1 shows that malaria prevalence has decreased across all domains, and Figure 6.2 shows that decreases in malaria prevalence between the two surveys are observed by the mother's level of education and wealth quintile status.

Figure 6.1 **Trends in malaria prevalence among children 6-59 months (according to microscopy)**

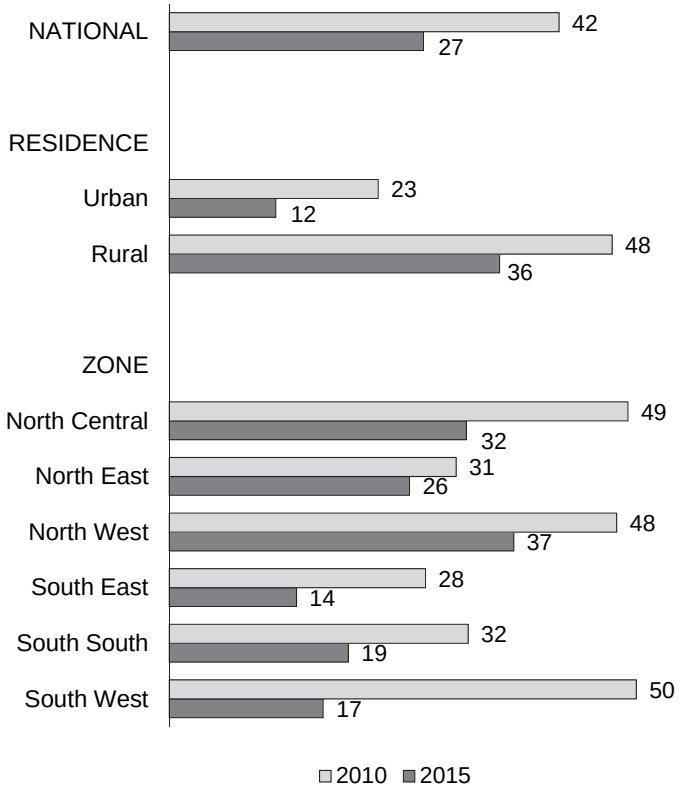
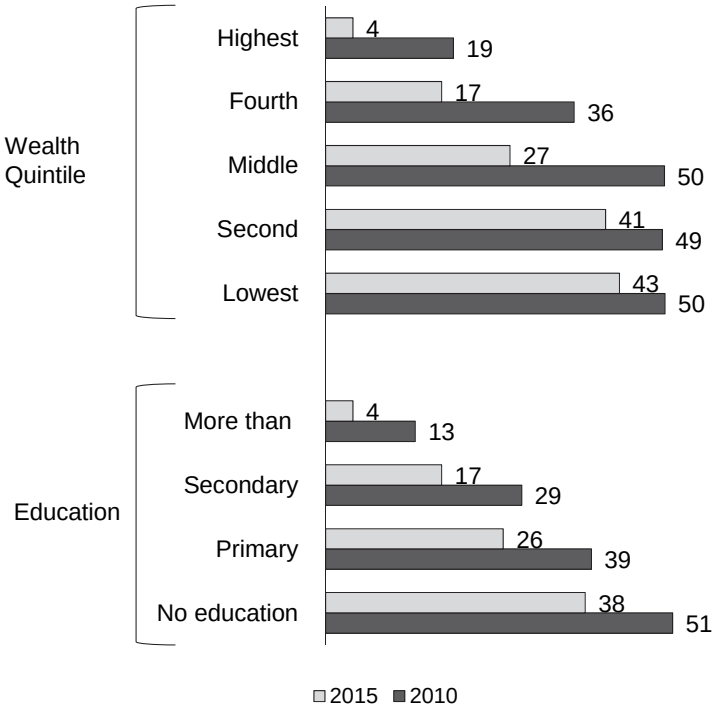


Figure 6.2 **Trends in malaria prevalence by education and wealth quintile**



6.3 MALARIA PREVALENCE AND FEVER WITHIN THE LAST 2 WEEKS AMONG CHILDREN

Tables 6.4.1 and 6.4.2 show the proportion with RDT and microscopy positive test results among children age 6-59 months reported to have had fever within the 2 weeks before the interview, by background characteristics and at national and state levels. Fifty-six percent of children with a fever in the last 2 weeks have positive RDT results and 33 percent of children with a fever have positive microscopy results.

Table 6.4.1 Malaria test positivity among children reporting having a fever within the last 2 weeks: National

Percentage of RDT and microscopy positive test results among eligible children 6-59 months who had a fever within the 2 weeks preceding the survey classified in two tests as having malaria, by background characteristics, Nigeria 2015

Background characteristic	Malaria test positivity according to RDT		Malaria test positivity according to microscopy	
	RDT positive	Number of children with fever in the last 2 weeks	Microscopy positive	Number of children with fever in the last 2 weeks
Age in months				
6-11	59.1	317	30.4	302
6-8	58.9	181	30.0	174
9-11	59.5	136	30.9	129
12-17	59.5	354	36.8	335
18-23	52.6	320	26.9	298
24-35	54.5	617	34.1	576
36-47	58.5	453	36.2	415
48-59	52.6	312	29.9	299
Sex				
Male	56.4	1,180	32.5	1,104
Female	55.8	1,193	33.2	1,122
Mother's interview status				
Interviewed	56.1	2,134	33.2	2,000
Not interviewed[1]	56.7	239	30.2	227
Residence				
Urban	34.8	608	14.1	570
Rural	63.5	1,765	39.3	1,656
Zone				
North Central	62.6	323	33.5	298
North East	53.0	392	31.2	372
North West	66.6	965	42.0	921
South East	36.9	201	14.7	187
South South	37.7	275	23.1	250
South West	46.9	217	22.1	198
Mother's education				
No education	66.6	1,113	41.0	1,050
Primary	52.9	363	32.0	338
Secondary	42.3	546	22.2	503
More than secondary	29.2	112	12.0	108
Wealth quintile				
Lowest	68.2	603	44.3	590
Second	70.0	650	42.6	597
Middle	57.9	452	29.7	411
Fourth	38.6	381	21.6	354
Highest	19.8	287	6.3	275
Total	56.1	2,373	32.9	2,226

Notes: Estimates for North East Zone do not include the rural areas of Borno State. Table excludes children whose mothers were deceased or were not interviewed.
RDT = Rapid Diagnostic Test

Table 6.4.2 Malaria test positivity among children reporting having a fever within the last 2 weeks: States

Percentage of eligible children 6-59 months classified in two tests as having malaria, by state, Nigeria 2015

State	Malaria test positivity according to RDT		Malaria test positivity according to microscopy	
	RDT positive	Number of children with fever in the last 2 weeks	Microscopy positive	Number of children with fever in the last 2 weeks
North Central				
FCT-Abuja	(48.2)	7	(31.0)	7
Benue	(80.8)	41	(48.2)	38
Kogi	(54.1)	25	*	20
Kwara	(67.7)	41	(26.1)	36
Nasarawa	61.7	63	38.9	55
Niger	51.0	78	29.9	77
Plateau	67.4	68	37.4	65
North East				
Adamawa	65.4	66	42.9	64
Bauchi	55.6	109	27.6	102
Borno (urban)	*	2	*	3
Gombe	57.2	47	32.4	48
Taraba	62.2	65	46.1	61
Yobe	35.3	103	17.8	93
North West				
Jigawa	63.4	99	30.0	91
Kaduna	61.3	96	40.5	89
Kano	70.8	212	35.3	209
Katsina	64.9	259	31.6	249
Kebbi	48.5	63	71.2	58
Sokoto	70.6	110	54.1	113
Zamfara	75.0	124	61.4	111
South East				
Abia	(36.4)	22	(11.1)	20
Anambra	(25.5)	55	(16.2)	54
Ebonyi	50.5	53	21.7	49
Enugu	(43.1)	30	(14.3)	28
Imo	(30.2)	41	(5.1)	35
South South				
Akwa Ibom	34.1	67	27.9	58
Bayelsa	43.2	47	35.9	43
Cross River	40.5	43	20.8	38
Delta	(42.2)	37	(28.1)	34
Edo	*	15	*	14
Rivers	(24.4)	65	(7.2)	63
South West				
Ekiti	*	13	*	13
Lagos	(5.4)	40	(0.0)	36
Ogun	(56.6)	33	(13.9)	30
Ondo	(53.3)	35	(23.0)	32
Osun	(56.2)	36	*	33
Oyo	(59.2)	60	(31.2)	54
Total	56.1	2,373	32.9	2,226

Notes: Estimates for North East Zone do not include the rural areas of Borno State. 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.
RDT = Rapid Diagnostic Test

6.4 MALARIA SPECIES IDENTIFICATION

In addition to measuring malaria prevalence among children age 6-59 months, *Plasmodium* species was identified for all blood specimens found positive during microscopy. Tables 6.5.1 and 6.5.2 show the percentage for each *Plasmodium* species and the percentage with mixed infections, by background characteristics at national and state levels. Overall, 94 percent of children were infected with *Plasmodium falciparum*, 2 percent have *P. malariae*, less than 1 percent have *P. ovale*, and 4 percent are infected with a mixture of two or more species. Each column under the *Species of Plasmodium* heading represents cases in which each species was identified,

alone without the presence of other species. In other words, the column for *P. falciparum* includes cases in which only *P. falciparum* was identified.

For the purposes of comparison, the 2010 NMIS malaria species data was newly analyzed according *P. falciparum* only, *P. malariae* only, *P. ovale* only, and mixed infections. In 2010, 84 percent of infected children had *P. falciparum*, 3 percent had *P. malariae*, 2 percent had *P. ovale*, and 10 percent had mixed infections. The percentage of children with *P. malariae* and mixed infections reduced by half between 2010 and 2015.

Table 6.5.1 Malaria species: National

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 2015

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	97.1	0.0	0.6	2.3	96
6-8	(96.0)	(0.0)	(1.3)	(2.7)	47
9-11	98.0	0.0	0.0	2.0	49
12-17	99.0	0.0	0.0	1.0	139
18-23	94.9	1.0	0.0	4.2	131
24-35	95.8	0.7	0.0	3.5	326
36-47	91.8	2.9	0.4	4.9	415
48-59	92.6	2.1	0.1	5.1	465
Sex					
Male	94.0	1.3	0.3	4.5	810
Female	94.2	2.0	0.1	3.7	763
Residence					
Urban	95.6	0.0	0.4	4.0	221
Rural	93.8	1.9	0.1	4.1	1,351
Zone					
North Central	91.8	2.6	0.0	5.7	343
North East	93.3	1.0	0.9	4.8	205
North West	95.4	1.8	0.1	2.7	687
South East	95.4	0.6	0.0	4.0	69
South South	94.1	1.5	0.0	4.4	121
South West	93.9	0.3	0.0	5.8	148
Total	94.1	1.6	0.2	4.1	1,573

Notes: Estimates for North East Zone do not include the rural areas of Borno State. Figures in parentheses are based on 25-49 unweighted cases.
[1] Includes cases with parasites identified as *P. falciparum* only
[2] Includes cases with parasites identified as *P. malariae* only
[3] Includes cases with parasites identified as *P. ovale* only
[4] Mixed infections include cases with two or more species identified.

Table 6.5.2 Malaria species: States

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 2015

State	Species of Plasmodium			Mixed infections[4]	Number of children with malaria parasites
	P. falciparum[1]	*P. malariae*[2]	*P. ovale*[3]		
North Central					
FCT-Abuja	*	*	*	*	5
Benue	93.2	12.2	3.6	9.0	102
Kogi	*	*	*	*	7
Kwara	(100.0)	(3.1)	(0.0)	(3.1)	32
Nasarawa	100.0	5.5	1.3	6.8	36
Niger	97.9	7.9	0.0	5.9	86
Plateau	100.0	1.8	0.0	1.8	75
North East					
Adamawa	100.0	1.8	0.0	1.8	47
Bauchi	(97.3)	(7.4)	(2.7)	(7.4)	47
Gombe	(100.0)	(4.4)	(0.0)	(4.4)	30
Taraba	95.0	2.6	8.5	6.1	51
Yobe	(100.0)	(3.6)	(0.0)	(3.6)	30
North West					
Jigawa	96.6	4.8	0.0	1.5	86
Kaduna	97.5	4.2	2.5	4.2	86
Kano	(100.0)	(0.0)	(0.0)	(0.0)	102
Katsina	95.3	6.3	0.0	1.6	124
Kebbi	100.0	1.6	0.0	1.6	100
Sokoto	98.9	6.5	0.0	5.4	73
Zamfara	98.7	6.6	0.0	5.3	116
South East					
Abia	*	*	*	*	5
Anambra	*	*	*	*	14
Ebonyi	(98.8)	(3.2)	(5.6)	(7.6)	36
Enugu	*	*	*	*	9
Imo	*	*	*	*	5
South South					
Akwa Ibom	*	*	*	*	22
Bayelsa	98.3	6.4	0.0	4.7	32
Cross River	*	*	*	*	21
Delta	*	*	*	*	23
Edo	*	*	*	*	10
Rivers	*	*	*	*	13
South West					
Ekiti	(100.0)	(10.3)	(2.7)	(12.9)	21
Ogun	*	*	*	*	14
Ondo	*	*	*	*	26
Osun	(100.0)	(3.4)	(0.0)	(3.4)	45
Oyo	*	*	*	*	42
Total	98.2	4.8	1.1	4.1	1,573

Notes: Estimates for North East Zone do not include the rural areas of Borno State. 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] Includes cases with parasites identified as *P. falciparum* only
[2] Includes cases with parasites identified as *P. malariae* only
[3] Includes cases with parasites identified as *P. ovale* only
[4] Mixed infections include cases with two or more species identified.

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SAMPLE DESIGN

Appendix A

A.1 INTRODUCTION

The 2015 Nigeria Malaria Indicator Survey (NMIS) is a representative probability sample designed to produce estimates for the country as a whole, for urban and rural areas separately, and for each of the geographic zones in Nigeria. The six geographic zones fully cover the country and each of the country's 36 states and the Federal Capital Territory (FCT) 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 SAMPLE FRAME

The sampling frame used for the 2015 NMIS was the Population and Housing Census of the Federal Republic of Nigeria (NPHC), which was conducted in 2006 by the National Population Commission (NPopC). 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 NPHC, each locality was subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster for the 2015 NMIS, is defined on the basis of EAs from the 2006 EA census frame.

Although the 2006 NPHC 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 was used to identify the list of EAs, estimate the number of households, and distinguish EAs as urban or rural for the survey sample frame. Before the sample selection, all localities were classified separately into urban or rural areas based on a predetermined minimum size of the urban areas (cut points); any locality with more than a minimum population size between 20,975 and 23,569 was classified as an urban locality. The cut points were determined by applying the state population growth rates to the 2006 census cut points. Table A.1 shows the state population growth rates, the 2006 urban-rural cut points, and the 2014 urban-rural cut points. These cut points were applied to the 2014 projected locality population. In the same table, the population distribution is presented by state and residence, which is based on the 2006 census results. The projected population estimates used to distinguish the residence areas are not presented here. Table A.2 shows the distribution and number of EAs from the sampling frame.

Table A.1 Population

Distribution of population in the census frame by states and residence, Nigeria 2015

Zone/State	Growth rate	2006 cut points	2014 cut points	Population in frame			Percent of total population	Percent urban
				Urban	Rural	Total		
North Central				6,306,370	14,066,404	20,372,774	14.51%	30.95%
BENUE	3.00	16,600	21,103	463,094	3,790,515	4,253,609	3.03%	10.89%
FCT ABUJA	9.30	11,200	23,569	899,703	506,682	1,406,385	1.00%	63.97%
KOGI	3.00	16,600	21,103	1,110,418	2,204,910	3,315,328	2.36%	33.49%
KWARA	3.00	6,600	21,103	1,619,155	745,731	2,364,886	1.68%	68.47%
NASARAWA	3.00	6,600	21,103	411,089	1,459,609	1,870,698	1.33%	21.98%
NIGER	3.40	16,200	21,264	931,288	3,023,387	3,954,675	2.82%	23.55%
PLATEAU	2.70	16,900	20,975	871,623	2,335,570	3,207,193	2.28%	27.18%
North East				4,170,827	14,814,133	18,984,960	13.52%	21.97%
ADAMAWA	2.90	16,700	21,061	783,977	2,395,523	3,179,500	2.26%	24.66%
BAUCHI	3.40	16,200	21,264	611,908	4,039,764	4,651,672	3.31%	13.15%
BORNO	3.40	16,200	21,264	1,387,434	2,784,113	4,171,547	2.97%	33.26%
GOMBE	3.20	16,400	21,185	539,899	1,825,601	2,365,500	1.68%	22.82%
TARABA	2.90	16,700	21,061	355,091	1,940,734	2,295,825	1.63%	15.47%
YOBE	3.50	16,100	21,302	492,518	1,828,398	2,320,916	1.65%	21.22%
North West				10,073,745	25,846,767	35,920,512	25.58%	28.04%
JIGAWA	2.90	16,700	21,061	452,462	3,909,329	4,361,791	3.11%	10.37%
KADUNA	3.00	16,600	21,103	2,799,079	3,315,487	6,114,566	4.35%	45.78%
KANO	3.30	16,300	21,225	3,925,245	5,478,986	9,404,231	6.70%	41.74%
KATSINA	3.00	16,600	21,103	1,093,024	4,709,805	5,802,829	4.13%	18.84%
KEBBI	3.10	16,500	21,144	496,745	2,761,395	3,258,140	2.32%	15.25%
SOKOTO	3.00	16,600	21,103	733,481	2,968,623	3,702,104	2.64%	19.81%
ZAMFARA	3.20	16,400	21,185	573,709	2,703,142	3,276,851	2.33%	17.51%
South East				9,861,839	6,534,453	16,396,292	11.67%	60.15%
ABIA	2.70	16,900	20,975	551,090	2,293,502	2,844,592	2.03%	19.37%
ANAMBRA	2.80	16,800	21,018	3,387,426	790,919	4,178,345	2.98%	81.07%
EBONYI	2.80	16,800	21,018	1,827,862	348,889	2,176,751	1.55%	83.97%
ENUGU	3.00	16,600	21,103	2,282,713	986,361	3,269,074	2.33%	69.83%
IMO	3.20	16,400	21,185	1,812,748	2,114,782	3,927,530	2.80%	46.15%
South South				7,085,129	13,963,895	21,049,024	14.99%	33.66%
AKWA IBOM	3.40	16,200	21,264	119,472	3,782,844	3,902,316	2.78%	3.06%
BAYELSA	2.90	16,700	21,061	410,562	1,293,325	1,703,887	1.21%	24.10%
CROSS RIVER	2.90	16,700	21,061	398,369	2,495,235	2,893,604	2.06%	13.77%
DELTA	3.20	16,400	21,185	1,920,210	2,194,864	4,115,074	2.93%	46.66%
EDO	2.70	16,900	20,975	1,824,233	1,409,735	3,233,968	2.30%	56.41%
RIVERS	3.40	16,200	21,264	2,412,283	2,787,892	5,200,175	3.70%	46.39%
South West				20,947,122	6,773,844	27,720,966	19.74%	75.56%
EKITI	3.10	16,500	21,144	1,783,711	615,371	2,399,082	1.71%	74.35%
LAGOS	3.20	16,400	21,185	9,112,690	-	9,112,690	6.49%	100.00%
OGUN	3.30	16,300	21,225	1,866,997	1,885,127	3,752,124	2.67%	49.76%
ONDO	3.00	16,600	21,103	1,608,673	1,852,151	3,460,824	2.46%	46.48%
OSUN	3.20	16,400	21,185	2,605,526	810,424	3,415,950	2.43%	76.28%
OYO	3.40	16,200	21,264	3,969,525	1,610,771	5,580,296	3.97%	71.13%
Nigeria				58,445,032	81,999,496	140,444,528	100.00%	41.61%

Table A.2 Enumeration areas

Distribution of the enumeration areas in the census frame by states and residence, Nigeria 2015

Zone/State	Number of EAs in frame		
	Urban	Rural	Total
North Central	30900	76206	107106
BENUE	2006	20850	22856
FCT ABUJA	2220	1370	3590
KOGI	4959	10887	15846
KWARA	11567	4704	16271
NASARAWA	1927	7292	9219
NIGER	4551	18894	23445
PLATEAU	3670	12209	15879
North East	19105	72691	91796
ADAMAWA	2590	10218	12808
BAUCHI	2520	17365	19885
BORNO	7552	16534	24086
GOMBE	1879	7615	9494
TARABA	1571	9029	10600
YOBE	2993	11930	14923
North West	41115	117997	159112
JIGAWA	2133	19060	21193
KADUNA	9152	12640	21792
KANO	15744	20615	36359
KATSINA	6418	26898	33316
KEBBI	2393	14248	16641
SOKOTO	2340	10439	12779
ZAMFARA	2935	14097	17032
South East	49,477	31,457	80934
ABIA	1996	9573	11569
ANAMBRA	17894	4013	21907
EBONYI	11509	2379	13888
ENUGU	9303	4694	13997
IMO	8775	10798	19573
South South	31265	67040	98305
AKWA IBOM	682	16431	17113
BAYELSA	2258	6749	9007
CROSS RIVER	1328	14994	16322
DELTA	8059	10150	18209
EDO	7774	5019	12793
RIVERS	11164	13697	24861
South West	91468	36278	127746
EKITI	8833	2728	11561
LAGOS	25424	0	25424
OGUN	6957	7536	14493
ONDO	8346	10909	19255
OSUN	19695	6212	25907
OYO	22213	8893	31106
Nigeria	263,330	401,669	664,999

A.3 SAMPLE DESIGN AND IMPLEMENTATION

The sample for the 2015 NMIS is a stratified sample selected in two stages. Stratification is achieved by separating each of the 36 states and FCT-Abuja into urban and rural areas. In total 73 sampling strata have been identified; in Lagos there are no rural areas. Samples were selected independently in every stratum by a two-stage selection process. Implicit stratifications were achieved at each of the lower administrative levels by sorting the sampling frame before sample selection, according to administrative order, and by using a probability proportional-to-size selection at the first sampling stage.

In the first stage, 333 EAs were selected with probability proportional to the EA size. The EA size is the number of households residing in the EA. A household listing operation was carried out in all selected EAs, and the resulting lists of households served as the sampling frame for selecting households in the second stage. In the second selection stage, a fixed number of 25 households were selected in each cluster by an equal probability systematic sampling method.

Table A.3 shows the distribution of sample EAs by urban and rural residence for each state and for each of the six geographic zones. Table A.4 shows the distribution of the expected number of completed individual interviews with women age 15-49 by urban and rural residence for each of the geographic zones.

Table A.3 Sample allocation of clusters and households by states

Sample allocation of clusters and households by states, according to residence, Nigeria 2015

Zone/State	Allocation of clusters			Allocation of households		
	Urban	Rural	Total	Urban	Rural	Total
North Central	23	40	63	575	1000	1575
BENUE	2	7	9	50	175	225
FCT ABUJA	6	3	9	150	75	225
KOGI	3	6	9	75	150	225
KWARA	6	3	9	150	75	225
NASARAWA	2	7	9	50	175	225
NIGER	2	7	9	50	175	225
PLATEAU	2	7	9	50	175	225
North East	13	41	54	325	1025	1350
ADAMAWA	2	7	9	50	175	225
BAUCHI	2	7	9	50	175	225
BORNO	3	6	9	75	150	225
GOMBE	2	7	9	50	175	225
TARABA	2	7	9	50	175	225
YOBE	2	7	9	50	175	225
North West	18	45	63	450	1125	1575
JIGAWA	2	7	9	50	175	225
KADUNA	4	5	9	100	125	225
KANO	4	5	9	100	125	225
KATSINA	2	7	9	50	175	225
KEBBI	2	7	9	50	175	225
SOKOTO	2	7	9	50	175	225
ZAMFARA	2	7	9	50	175	225
South East	26	19	45	650	475	1125
ABIA	2	7	9	50	175	225
ANAMBRA	7	2	9	175	50	225
EBONYI	7	2	9	175	50	225
ENUGU	6	3	9	150	75	225
IMO	4	5	9	100	125	225
South South	19	35	54	475	875	1350
AKWA IBOM	2	7	9	50	175	225
BAYELSA	2	7	9	50	175	225
CROSS RIVER	2	7	9	50	175	225
DELTA	4	5	9	100	125	225
EDO	5	4	9	125	100	225
RIVERS	4	5	9	100	125	225
South West	37	17	54	925	425	1350
EKITI	7	2	9	175	50	225
LAGOS	9	0	9	225	0	225
OGUN	4	5	9	100	125	225
ONDO	4	5	9	100	125	225
OSUN	7	2	9	175	50	225
OYO	6	3	9	150	75	225
Nigeria	136	197	333	3400	4925	8325

Table A.4 Sample allocation of expected completed interviews with women

Sample allocation of expected completed interviews with women by zones, according to residence, Nigeria 2015

Zone	Completed women		
	Urban	Rural	Total
North Central	532	989	1521
North East	300	1014	1314
North West	416	1113	1529
South East	604	471	1075
South South	441	866	1307
South West	861	422	1283
Nigeria	3166	4878	8029

A.4 SAMPLE PROBABILITIES AND SAMPLE WEIGHTS

Due to the non-proportional allocation of the sample to the different states and the possible differences in response rates, sampling weights are required for any analysis using the 2015 NMIS data to ensure the actual representativeness of the survey results at national, zonal, and state levels. Because the 2015 NMIS sample is a two-stage stratified cluster sample selected from the sampling frame, sampling weights were calculated based on sampling probabilities separately for each sampling stage, and for each cluster. We use the following notations:

P_{1hi}: first-stage sampling probability of the i^{th} cluster in stratum h

P_{2hi}: second-stage sampling probability within the i^{th} cluster (households)

Let a_h be the number of clusters selected in stratum h, M_{hi} is the number of households according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ is the total number of households in the stratum. The probability of selecting the i^{th} cluster in the NMIS sample is calculated as follows:

$$\frac{a_h M_{hi}}{\sum M_{hi}}$$

Let b_{hi} be the proportion of households in the selected segment compared with the total number of households in the EA i in stratum h if the EA is segmented, otherwise $b_{hi} = 1$. Then the probability of selecting cluster i in the sample is:

$$P_{1hi} = \frac{a_h M_{hi}}{\sum M_{hi}} \times b_{hi}$$

Let L_{hi} be the number of households listed in the household listing operation in cluster i in stratum h, and let g_{hi} be the number of households selected in the cluster. The second stage's selection probability for each household in the cluster is calculated as follows:

$$P_{2hi} = \frac{g_{hi}}{L_{hi}}$$

The overall selection probability of each household in cluster i of stratum h is therefore the product of the selection probabilities:

$$P_{hi} = P_{1hi} \times P_{2hi}$$

The design weight for each household in cluster i of stratum h is the inverse of its overall selection probability:

$$W_{hi} = 1/P_{hi}$$

Next, the design weight is adjusted for household non-response and individual non-response to get the sampling weights for households and for women, respectively. Non-response is adjusted at the sampling stratum

level. For the household sampling weight, the household design weight is multiplied by the inverse of the household response rate, by stratum. For the women's individual sampling weight, the household sampling weight is multiplied by the inverse of the women's individual response rate, by stratum. After adjusting for non-response, the sampling weights are normalised to get the final standard weights that appear in the data files. The normalisation process is done to obtain a total number of unweighted cases equal to the total number of weighted cases at the national level, for the total number of households and women. Normalisation is done by multiplying the sampling weight by the estimated sampling fraction obtained from the survey for the household weight and the individual woman's weight. The normalised weights are relative weights, which are valid for estimating means, proportions, ratios, and rates, but which are not valid for estimating population totals or for pooled data.

A.5 SAMPLE IMPLEMENTATION

Table A.5 presents response rates for the household and woman's survey by urban-rural residence and by zone.

Table A.5 Sample implementation: Women

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 2015

	Residence		Zone						
Result	Urban	Rural	North Central	North East	North West	South East	South South	South West	Total
Selected households									
Completed (C)	93.1	96.4	89.4	100.0	98.2	89.1	95.0	98.5	95.1
Household present but no competent respondent at home (HP)	0.3	0.1	0.6	0.0	0.0	0.7	0.0	0.1	0.2
Refused (R)	1.2	0.3	1.5	0.0	0.1	1.0	0.7	0.4	0.6
Dwelling not found (DNF)	0.4	0.3	1.6	0.0	0.0	0.0	0.1	0.0	0.3
Household absent (HA)	2.4	1.5	3.7	0.0	0.6	4.2	2.4	0.7	1.9
Dwelling vacant/address not a dwelling (DV)	2.3	1.2	3.0	0.0	0.8	4.5	1.5	0.1	1.6
Dwelling destroyed (DD)	0.0	0.1	0.1	0.0	0.2	0.0	0.2	0.0	0.1
Other (O)	0.2	0.1	0.0	0.0	0.1	0.5	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 of sampled households	3,400	4,748	1,549	1,200	1,575	1,125	1,349	1,350	8,148
Household response rate (HRR)[1]	98.0	99.3	96.0	100.0	99.9	98.1	99.1	99.6	98.8
Eligible women									
Completed (EWC)	99.3	99.0	97.4	99.9	99.8	98.2	99.2	99.9	99.1
Not at home (EWNH)	0.2	0.5	1.1	0.0	0.0	1.1	0.2	0.0	0.4
Refused (EWR)	0.3	0.4	1.2	0.0	0.0	0.3	0.5	0.1	0.3
Incapacitated (EWI)	0.2	0.1	0.3	0.0	0.2	0.4	0.1	0.0	0.1
Other (EWO)	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	3,221	4,885	1,511	1,542	1,818	944	1,182	1,109	8,106
Eligible women response rate (EWRR)[2]	99.3	99.0	97.4	99.9	99.8	98.2	99.2	99.9	99.1
Overall women response rate (ORR)[3]	97.3	98.3	93.5	99.9	99.7	96.4	98.3	99.5	97.9

[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: nonsampling errors and 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 2015 Nigeria Malaria Indicator Survey (NMIS) to minimize 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 2015 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 among all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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 2015 NMIS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulas. Sampling errors are computed in either ISSA or SAS, using programs developed by ICF Macro. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions, or ratios.

The Taylor linearization 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, the design effect (DEFT) for each estimate is also calculated. The design effect 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. Relative standard errors and confidence limits for the estimates are also calculated.

Sampling errors for the 2015 NMIS are calculated for selected variables considered to be of primary interest. The results are presented in this appendix for the country as a whole, for urban and rural areas, and for each of the country geographic zones (North Central, North East, North West, South East, South South, South West). For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 through B.10 present the value of the statistic (R), its standard error (SE), the number of unweighted (N) and weighted (WN) 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 a simple random sample is zero (when the estimate is close to 0 or 1).

The confidence interval (e.g., as calculated for a child with fever in the last 2 weeks can be interpreted as follows: the overall average from the national sample is 0.409, and its standard error is 0.01. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, that is, $0.409 \pm 2 \times 0.01$. There is a high probability (95 percent) that the true proportion of children having fever in the last 2 weeks is between 0.388 and 0.429.

For the total sample, the value of the DEFT, averaged over all variables, is 1.70. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.70 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Nigeria MIS 2015

Variable	Type of Estimate	Base Population
No education	Proportion	All women 15-49
At least some secondary education	Proportion	All women 15-49
Ownership of at least one ITN	Proportion	Households
Child slept inside an ITN last night	Proportion	Children under 5 in households
Pregnant women slept inside an ITN last night	Proportion	Pregnant women 15-49 in households
All women slept inside an ITN last night	Proportion	All women 15-49 in households
Received 2+ doses of SP during antenatal visit	Proportion	Last birth for all women 15-49 in last 2 years
Received 3+ doses of SP during antenatal visit	Proportion	Last birth for all women 15-49 in last 2 years
Child has fever in last 2 weeks	Proportion	Children under 5 in women's birth history
Child sought care/treatment from a health facility	Proportion	Children under 5 with fever in last 2 weeks
Child took ACT	Proportion	Children under 5 with fever in last 2 weeks
Child has any anaemia (Hb < 11.0 g/dL)	Proportion	Children 6-59 months tested for anaemia
Child has moderate anaemia (Hb 8.0-9.9 g/dL)	Proportion	Children 6-59 months tested for anaemia
Child has severe (Hb < 8.0 g/dL)	Proportion	Children 6-59 months tested for anaemia
Child has malaria (based on rapid test)	Proportion	Children 6-59 months tested for malaria using RDT
Child has malaria (based on microscopy test)	Proportion	Children 6-59 months tested for malaria using microscopy

Table B.2 Sampling errors: Total sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.388	0.013	8034	8034	2.372	0.033	0.362	0.414
At least some secondary education	0.457	0.013	8034	8034	2.388	0.029	0.43	0.483
Ownership of at least one ITN	0.615	0.009	7745	7745	1.652	0.015	0.597	0.633
Child slept inside an ITN last night	0.386	0.013	6965	7008	1.65	0.033	0.36	0.412
Pregnant women slept inside an ITN last night	0.431	0.023	861	897	1.373	0.054	0.385	0.477
All women slept inside an ITN last night	0.363	0.011	8106	8031	1.698	0.031	0.341	0.385
Received 2+ doses of SP during antenatal visit	0.372	0.014	2490	2522	1.431	0.037	0.344	0.399
Received 3+ doses of SP during antenatal visit	0.19	0.01	2490	2522	1.343	0.055	0.169	0.211
Child has fever in last 2 weeks	0.409	0.01	6264	6364	1.481	0.025	0.388	0.429
Child sought care/treatment from a health facility	0.661	0.015	2622	2600	1.381	0.022	0.631	0.69
Child took ACT	0.376	0.021	1099	1070	1.264	0.057	0.333	0.419
Child has anaemia (haemoglobin < 11.0 g/dL)	0.684	0.01	6007	6055	1.583	0.015	0.664	0.705
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.338	0.009	6007	6055	1.403	0.026	0.32	0.356
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.093	0.006	6007	6055	1.572	0.067	0.081	0.106
Child has malaria (based on rapid test)	0.451	0.016	6003	6050	2.135	0.036	0.419	0.483
Child has malaria (based on microscopy test)	0.273	0.013	5732	5764	1.947	0.048	0.247	0.3

Table B.3 Sampling errors: Urban sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.158	0.015	3200	3129	2.277	0.093	0.128	0.187
At least some secondary education	0.702	0.02	3200	3129	2.43	0.028	0.662	0.741
Ownership of at least one ITN	0.564	0.012	3166	3083	1.385	0.022	0.54	0.588
Child slept un inside der an ITN last night	0.305	0.016	2375	2349	1.294	0.052	0.273	0.336
Pregnant women slept inside an ITN last night	0.322	0.037	268	271	1.313	0.115	0.248	0.395
All women slept inside an ITN last night	0.275	0.014	3221	3128	1.471	0.052	0.246	0.303
Received 2+ doses of SP during antenatal visit	0.504	0.022	884	889	1.339	0.044	0.459	0.548
Received 3+ doses of SP during antenatal visit	0.241	0.018	884	889	1.292	0.076	0.205	0.278
Child has fever in last 2 weeks	0.302	0.016	2144	2160	1.468	0.053	0.27	0.334
Child sought care/treatment from a health facility	0.712	0.022	658	653	1.117	0.031	0.667	0.756
Child took ACT	0.417	0.038	336	343	1.266	0.091	0.341	0.493
Child has anaemia (haemoglobin < 11.0 g/dL)	0.552	0.018	2035	2028	1.559	0.032	0.517	0.588
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.247	0.014	2035	2028	1.386	0.055	0.22	0.274
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.047	0.01	2035	2028	1.962	0.204	0.028	0.066
Child has malaria (based on rapid test)	0.242	0.022	2035	2029	2.125	0.093	0.197	0.287
Child has malaria (based on microscopy test)	0.114	0.014	1976	1967	1.648	0.118	0.087	0.141

Table B.4 Sampling errors: Rural sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.535	0.018	4834	4905	2.488	0.033	0.5	0.571
At least some secondary education	0.301	0.016	4834	4905	2.432	0.053	0.269	0.333
Ownership of at least one ITN	0.649	0.013	4579	4662	1.81	0.02	0.623	0.674
Child slept inside an ITN last night	0.427	0.018	4590	4659	1.78	0.041	0.392	0.463
Pregnant women slept inside an ITN last night	0.478	0.028	593	626	1.383	0.059	0.421	0.535
All women slept inside an ITN last night	0.42	0.016	4885	4903	1.807	0.037	0.388	0.451
Received 2+ doses of SP during antenatal visit	0.3	0.017	1606	1633	1.452	0.055	0.267	0.333
Received 3+ doses of SP during antenatal visit	0.162	0.013	1606	1633	1.383	0.079	0.136	0.187
Child has fever in last 2 weeks	0.463	0.013	4120	4203	1.475	0.028	0.437	0.489
Child sought care/treatment from a health facility	0.644	0.018	1964	1947	1.435	0.028	0.607	0.68
Child took ACT	0.357	0.026	763	727	1.28	0.073	0.304	0.409
Child has anaemia (haemoglobin < 11.0 g/dL)	0.751	0.012	3972	4027	1.597	0.016	0.727	0.775
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.384	0.011	3972	4027	1.363	0.029	0.362	0.406
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.117	0.008	3972	4027	1.488	0.069	0.101	0.133
Child has malaria (based on rapid test)	0.557	0.02	3968	4021	2.21	0.036	0.516	0.597
Child has malaria (based on microscopy test)	0.356	0.018	3756	3797	1.995	0.05	0.32	0.391

Table B.5 Sampling errors: North Central sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.421	0.031	1472	1357	2.443	0.075	0.358	0.484
At least some secondary education	0.365	0.029	1472	1357	2.297	0.079	0.307	0.423
Ownership of at least one ITN	0.503	0.018	1385	1311	1.345	0.036	0.467	0.54
Child slept inside an ITN last night	0.348	0.03	1384	1305	1.717	0.086	0.288	0.407
Pregnant women slept inside an ITN last night	0.352	0.043	127	129	1.064	0.122	0.266	0.438
All women slept inside an ITN last night	0.302	0.023	1511	1356	1.602	0.076	0.256	0.348
Received 2+ doses of SP during antenatal visit	0.284	0.028	477	441	1.362	0.099	0.228	0.34
Received 3+ doses of SP during antenatal visit	0.18	0.024	477	441	1.393	0.136	0.131	0.229
Child has fever in last 2 weeks	0.299	0.02	1226	1181	1.369	0.067	0.259	0.339
Child sought care/treatment from a health facility	0.768	0.024	403	353	1.017	0.031	0.72	0.815
Child took ACT	0.45	0.052	135	119	1.101	0.116	0.346	0.555
Child has anaemia (haemoglobin < 11.0 g/dL)	0.644	0.024	1197	1135	1.623	0.038	0.596	0.693
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.321	0.019	1197	1135	1.338	0.06	0.283	0.359
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.045	0.006	1197	1135	1.038	0.138	0.033	0.058
Child has malaria (based on rapid test)	0.507	0.036	1196	1134	2.205	0.071	0.435	0.58
Child has malaria (based on microscopy test)	0.322	0.026	1155	1094	1.737	0.082	0.269	0.374

Table B.6 Sampling errors: North East sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.582	0.042	1541	1077	3.353	0.073	0.497	0.666
At least some secondary education	0.263	0.028	1541	1077	2.508	0.107	0.206	0.319
Ownership of at least one ITN	0.781	0.029	1200	843	2.426	0.037	0.723	0.839
Child slept inside an ITN last night	0.474	0.03	1383	987	1.696	0.064	0.413	0.535
Pregnant women slept inside an ITN last night	0.548	0.041	191	140	1.146	0.075	0.465	0.63
All women slept inside an ITN last night	0.482	0.028	1542	1077	1.743	0.058	0.426	0.538
Received 2+ doses of SP during antenatal visit	0.435	0.039	499	350	1.767	0.09	0.357	0.513
Received 3+ doses of SP during antenatal visit	0.26	0.032	499	350	1.644	0.124	0.196	0.325
Child has fever in last 2 weeks	0.48	0.025	1268	904	1.646	0.053	0.429	0.531
Child sought care/treatment from a health facility	0.691	0.03	614	434	1.363	0.044	0.63	0.751
Child took ACT	0.308	0.045	306	206	1.408	0.146	0.218	0.398
Child has anaemia (haemoglobin < 11.0 g/dL)	0.63	0.029	1161	829	1.955	0.047	0.571	0.688
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.295	0.022	1161	829	1.577	0.075	0.251	0.339
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.072	0.015	1161	829	1.927	0.202	0.043	0.102
Child has malaria (based on rapid test)	0.428	0.043	1156	824	2.488	0.099	0.343	0.513
Child has malaria (based on microscopy test)	0.263	0.035	1121	800	2.318	0.133	0.193	0.334

Table B.7 Sampling errors: North West sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.7	0.028	1814	2359	2.563	0.039	0.644	0.755
At least some secondary education	0.185	0.027	1814	2359	2.936	0.145	0.131	0.239
Ownership of at least one ITN	0.836	0.017	1547	1993	1.825	0.021	0.801	0.87
Child slept inside an ITN last night	0.552	0.029	1746	2280	1.779	0.053	0.494	0.611
Pregnant women slept inside an ITN last night	0.588	0.051	245	325	1.593	0.086	0.487	0.69
All women slept inside an ITN last night	0.562	0.027	1818	2358	1.828	0.048	0.508	0.615
Received 2+ doses of SP during antenatal visit	0.287	0.026	610	815	1.45	0.091	0.234	0.339
Received 3+ doses of SP during antenatal visit	0.154	0.017	610	815	1.206	0.113	0.119	0.189
Child has fever in last 2 weeks	0.521	0.023	1563	2053	1.583	0.044	0.476	0.567
Child sought care/treatment from a health facility	0.595	0.031	841	1070	1.539	0.051	0.534	0.656
Child took ACT	0.356	0.04	315	401	1.289	0.113	0.276	0.437
Child has anaemia (haemoglobin < 11.0 g/dL)	0.809	0.016	1503	1953	1.444	0.02	0.777	0.841
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.432	0.016	1503	1953	1.272	0.038	0.399	0.464
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.177	0.016	1503	1953	1.558	0.092	0.144	0.209
Child has malaria (based on rapid test)	0.583	0.033	1502	1951	2.246	0.057	0.517	0.65
Child has malaria (based on microscopy test)	0.372	0.029	1420	1833	1.941	0.077	0.315	0.429

Table B.8 Sampling errors: South East sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.043	0.009	927	811	1.406	0.218	0.024	0.062
At least some secondary education	0.801	0.023	927	811	1.732	0.028	0.755	0.846
Ownership of at least one ITN	0.492	0.019	1002	876	1.208	0.039	0.454	0.53
Child slept inside an ITN last night	0.182	0.024	684	602	1.195	0.132	0.134	0.23
Pregnant women slept inside an ITN last night	0.148	0.033	88	77	0.867	0.219	0.083	0.213
All women slept inside an ITN last night	0.149	0.019	944	811	1.465	0.128	0.111	0.187
Received 2+ doses of SP during antenatal visit	0.425	0.039	247	225	1.267	0.092	0.347	0.504
Received 3+ doses of SP during antenatal visit	0.26	0.036	247	225	1.322	0.139	0.187	0.332
Child has fever in last 2 weeks	0.383	0.02	629	564	0.9	0.052	0.344	0.423
Child sought care/treatment from a health facility	0.759	0.032	233	216	1.006	0.042	0.696	0.822
Child took ACT	0.473	0.063	111	102	1.127	0.133	0.347	0.599
Child has anaemia (haemoglobin < 11.0 g/dL)	0.57	0.028	591	514	1.287	0.05	0.513	0.626
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.232	0.023	591	514	1.243	0.098	0.187	0.277
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.054	0.011	591	514	1.156	0.211	0.031	0.076
Child has malaria (based on rapid test)	0.317	0.035	594	516	1.626	0.111	0.247	0.387
Child has malaria (based on microscopy test)	0.139	0.026	567	497	1.533	0.186	0.087	0.191

Table B.9 Sampling errors: South South sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.07	0.012	1172	1080	1.565	0.167	0.046	0.093
At least some secondary education	0.759	0.029	1172	1080	2.338	0.039	0.7	0.817
Ownership of at least one ITN	0.522	0.027	1281	1154	1.927	0.052	0.468	0.575
Child slept inside an ITN last night	0.266	0.028	881	777	1.466	0.106	0.21	0.323
Pregnant women slept inside an ITN last night	0.255	0.036	114	107	0.901	0.141	0.183	0.328
All women slept inside an ITN last night	0.246	0.037	1182	1080	2.39	0.149	0.173	0.32
Received 2+ doses of SP during antenatal visit	0.393	0.028	313	282	0.988	0.07	0.338	0.448
Received 3+ doses of SP during antenatal visit	0.158	0.025	313	282	1.187	0.157	0.108	0.208
Child has fever in last 2 weeks	0.429	0.026	785	700	1.237	0.06	0.377	0.48
Child sought care/treatment from a health facility	0.661	0.02	340	300	0.659	0.03	0.622	0.701
Child took ACT	0.422	0.047	135	130	0.993	0.112	0.327	0.516
Child has anaemia (haemoglobin < 11.0 g/dL)	0.695	0.027	769	669	1.484	0.038	0.641	0.748
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.329	0.024	769	669	1.307	0.072	0.282	0.376
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.055	0.011	769	669	1.331	0.2	0.033	0.077
Child has malaria (based on rapid test)	0.286	0.032	768	668	1.682	0.111	0.223	0.35
Child has malaria (based on microscopy test)	0.193	0.035	736	646	2.069	0.18	0.123	0.262

Table B.10 Sampling errors: South West sample, Nigeria MIS 2015

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits Lower (R-2SE)	Confidence limits Upper (R+2SE)
No education	0.119	0.028	1108	1351	2.817	0.231	0.064	0.174
At least some secondary education	0.731	0.028	1108	1351	2.117	0.039	0.675	0.788
Ownership of at least one ITN	0.476	0.021	1330	1567	1.521	0.044	0.434	0.517
Child slept inside an ITN last night	0.197	0.02	887	1057	1.219	0.104	0.156	0.238
Pregnant women slept inside an ITN last night	0.288	0.054	96	119	1.167	0.186	0.181	0.395
All women slept inside an ITN last night	0.206	0.015	1109	1350	1.043	0.072	0.176	0.236
Received 2+ doses of SP during antenatal visit	0.537	0.029	344	409	1.056	0.054	0.479	0.594
Received 3+ doses of SP during antenatal visit	0.195	0.025	344	409	1.159	0.129	0.145	0.245
Child has fever in last 2 weeks	0.235	0.021	793	962	1.308	0.089	0.193	0.276
Child sought care/treatment from a health facility	0.652	0.044	191	226	1.14	0.067	0.564	0.739
Child took ACT	0.351	0.064	97	113	1.179	0.181	0.224	0.478
Child has anaemia (haemoglobin < 11.0 g/dL)	0.58	0.029	786	955	1.59	0.051	0.521	0.638
Child had moderate anaemia (haemoglobin 8.0-9.9 g/dL)	0.269	0.023	786	955	1.392	0.084	0.224	0.315
Child had severe anaemia (haemoglobin < 8.0 g/dL)	0.047	0.009	786	955	1.25	0.204	0.028	0.066
Child has malaria (based on rapid test)	0.321	0.033	787	957	1.721	0.104	0.255	0.388
Child has malaria (based on microscopy test)	0.153	0.022	733	894	1.483	0.143	0.11	0.197

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 2015

	Women		Men			Women		Men	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	596	3.2	698	3.7	35	528	2.8	525	2.8
1	635	3.4	680	3.6	36	95	0.5	82	0.4
2	666	3.5	695	3.7	37	110	0.6	121	0.6
3	765	4.1	760	4.0	38	153	0.8	149	0.8
4	765	4.0	727	3.9	39	83	0.4	68	0.4
5	620	3.3	633	3.4	40	442	2.3	575	3.1
6	703	3.7	704	3.7	41	35	0.2	54	0.3
7	667	3.5	725	3.9	42	115	0.6	150	0.8
8	677	3.6	660	3.5	43	81	0.4	86	0.5
9	437	2.3	449	2.4	44	54	0.3	49	0.3
10	633	3.4	694	3.7	45	228	1.2	375	2.0
11	314	1.7	296	1.6	46	55	0.3	56	0.3
12	485	2.6	530	2.8	47	61	0.3	58	0.3
13	397	2.1	385	2.1	48	73	0.4	83	0.4
14	410	2.2	351	1.9	49	40	0.2	55	0.3
15	331	1.8	536	2.9	50	360	1.9	381	2.0
16	265	1.4	265	1.4	51	87	0.5	25	0.1
17	234	1.2	275	1.5	52	140	0.7	98	0.5
18	370	2.0	371	2.0	53	69	0.4	60	0.3
19	180	1.0	172	0.9	54	65	0.3	42	0.2
20	678	3.6	478	2.5	55	225	1.2	214	1.1
21	175	0.9	143	0.8	56	57	0.3	54	0.3
22	284	1.5	216	1.2	57	39	0.2	50	0.3
23	207	1.1	178	0.9	58	43	0.2	51	0.3
24	181	1.0	137	0.7	59	14	0.1	29	0.2
25	769	4.1	470	2.5	60	204	1.1	296	1.6
26	175	0.9	140	0.7	61	24	0.1	25	0.1
27	242	1.3	165	0.9	62	37	0.2	65	0.3
28	328	1.7	224	1.2	63	21	0.1	31	0.2
29	138	0.7	104	0.6	64	18	0.1	25	0.1
30	766	4.1	602	3.2	65	121	0.6	138	0.7
31	114	0.6	78	0.4	66	9	0.0	23	0.1
32	241	1.3	233	1.2	67	22	0.1	43	0.2
33	114	0.6	90	0.5	68	39	0.2	43	0.2
34	86	0.5	87	0.5	69	16	0.1	20	0.1
					70+	383	2.0	526	2.8
					Don't know/ missing	101	0.5	100	0.5
					Total	18,896	100.0	18,779	100.0

Note: The de facto population includes all residents and nonresidents who stayed in the household the night before the interview.

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 percent distribution and percentage of eligible women who were interviewed (weighted), by 5-year age groups, Nigeria 2015

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percentage	
10-14	2,240	na	na	na
15-19	1,380	1,366	17.1	99.0
20-24	1,525	1,514	19.0	99.3
25-29	1,652	1,645	20.6	99.5
30-34	1,320	1,312	16.5	99.4
35-39	970	966	12.1	99.6
40-44	728	716	9.0	98.4
45-49	457	454	5.7	99.2
50-54	722	na	na	na
15-49	8,031	7,972	100.0	99.3

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 Questionnaire.
na = Not applicable

Table C.3 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Nigeria 2015

Subject	Percentage with information missing	Number of cases
Month only (births in the 15 years preceding the survey)	2.95	7,724
Month and year (births in the 15 years preceding the survey)	0.00	7,724
Age at death (deceased children born in the 15 years preceding the survey)	0.00	305
Respondent's education (all women age 15-49)	0.00	8,034
Diarrhoea in last 2 weeks (living children 0-59 months)	0.00	6,364
Height (living children age 0-59 months from the Household Questionnaire)	100.00	7,004
Weight (living children age 0-59 months from the Household Questionnaire)	100.00	7,004
Height or weight (living children age 0-59 months from the Household Questionnaire)	100.00	7,004
Anaemia (living children age 6-59 months from the Household Questionnaire)	4.94	6,369

[1] Both year and age missing

Table C.4 Births by calendar years

Number of births, percentage with complete birth date, sex ratio at birth, and calendar year ratio by calendar year, according to living (L), dead (D), and total (T) children (weighted), Nigeria 2015

Calendar year	Number of births			Percentage with complete birth date[1]			Sex ratio at birth[2]			Calendar year ratio[3]		
	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total
2015	1,126	42	1,169	99.8	100.0	99.8	123.1	113.7	122.7	na	na	na
2014	1,286	47	1,333	98.6	88.0	98.3	103.0	103.3	103.0	na	na	na
2013	1,213	78	1,291	96.3	85.5	95.7	102.7	49.2	98.4	91.3	156.0	93.6
2012	1,372	54	1,425	97.3	81.6	96.7	101.5	99.5	101.4	110.1	87.4	109.1
2011	1,278	45	1,323	97.1	77.9	96.4	98.2	145.1	99.5	101.6	96.9	101.4
2010	1,144	39	1,183	96.7	65.5	95.6	104.1	123.7	104.7	179.1	172.7	178.9
2011-2015	6,275	266	6,541	97.8	86.2	97.3	104.9	89.3	104.2	na	na	na
2006-2010	1,144	39	1,183	96.7	65.5	95.6	104.1	123.7	104.7	na	na	na
All	7,419	305	7,724	97.6	83.6	97.1	104.8	93.0	104.3	na	na	na

na = Not applicable
[1] Both year and month of birth given
[2] (Bm/Bf)x100, where Bm and Bf are the numbers of male and female births, respectively
[3] [2Bx/(Bx-1+Bx+1)]x100, where Bx is the number of births in calendar year x

SURVEY PERSONNEL

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Osun		Oyo	
Orhorhamrepu E. Tosin	**Supervisor**	Wumi Tijani	**Supervisor**
Atande Tinuade	Interviewer	Aramide Evelyn	Interviewer
Olaoluwa Modupe B.	Interviewer	Abass Adeola	Interviewer
Olajumoke Dada Susan	Nurse	Adeleke Elizabeth	Nurse
Sarafa Olaniyi	Lab Scientist	Adetola Adeyemi	Lab Scientist

QUESTIONNAIRES

Appendix **E**

21 AUG 2015

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

NIGERIA MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

NATIONAL MALARIA ELIMINATION PROGRAM
NATIONAL POPULATION COMMISSION
NATIONAL BUREAU OF STATISTICS

National Health Research Ethics Committee
Assigned Number NHREC/01/01/2007-11/05/2015

IDENTIFICATION

STATE _____ | | | |

LOCAL GOVT. AREA _____ | | | |

LOCALITY _____ | | | | | | | | | |

ENUMERATION AREA _____ | | | | |

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

CLUSTER NUMBER | | | |

BUILDING NUMBER | | | |

HOUSEHOLD HEAD NAME / HOUSEHOLD NUMBER _____ | | | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
				YEAR 2015
INTERVIEWER NAME				INT NO.
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

NAME _____

DATE _____

(NUMBER)

OFFICE EDITOR | |

KEYED BY | |

Introduction and Consent

Greetings. My name is _____ and I am working with the National Population Commission (NPopC) and the National Malaria Elimination Program (NMEP). 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/01/01/2007-11/05/2015, for the data collection period of September 2015 to November 2015. 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):

NMEP Contact Person: Dr. Nnenna Ezeigwe, National Coordinator; **Email:** drninaezeigwe@gmail.com; **Phone:** 08033000296
NPopC CONTACT PERSON: Mr. Bolaji Akinsulie, Project Director; **Email:** bolajiakinsulie@yahoo.com; **Phone**: 08023307806
NHREC Contact Person(s): Secretary, NHREC; **Email:** secretary@nhrec.net; **Phone:** 095238367
Desk Officer, NHREC; **Email:** deskofficer@nhrec.net; **Phone:** ----

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

100	RECORD THE TIME.	HOURS . . . . . ☐☐ MINUTES . . . . . ☐☐

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
08 = BROTHER OR SISTER
09 = NIECE/NEPHEW BY BLOOD
10 = NIECE/NEPHEW BY MARRIAGE
11 = OTHER RELATIVE

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'. IF DON'T KNOW CODE '99998'
	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.				
	(11)	(12)	(13)	(14)	(15)	(16)
	Y N	CLASS/ LEVEL YEAR	Y N DK	Y N DK		NAIRA
01	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
02	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
03	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
04	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
05	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
06	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
07	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
08	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
09	1 2 ↓ GO TO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
10	1 2 ↓ GO TO 13		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. 15: PLACE OF TREATMENT

01 = GOVERNMENT HOSPITAL
02 = GOVERNMENT HEALTH CENTER
03 = GOVERNMENT HEALTH CLINIC
04 = PRIVATE HOSPITAL/CLINIC
09 = SHOP
10 = TRADITIONAL PRACTITIONER
11 = ROLE MODEL CAREGIVER/ COMMUNITY WORKER
12 = DRUG HAWKER

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

DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
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?	How much did the treatment cost?
	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.			USE CODES BELOW.	INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 99990, WRITE '99990'. IF FREE, CIRCLE CODE '99995'. IF DON'T KNOW CODE '99998'

05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = CHEMIST/PMV
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)
			M F	Y N	Y N	IN YEARS		Y N	
11			1 2	1 2	1 2		11	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?	How much did the treatment cost?
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(1)	(11)	(12)	(13)	(14)	(15)	(16)
	Y N	CLASS/ LEVEL YEAR	Y N DK	Y N DK		NAIRA
11	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
12	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
13	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE		FREE 99995
14	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
15	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
16	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
17	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
18	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
19	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995
20	1 2 ↓ GO TTO 13		1 2 8 NEXT LINE NO.	1 2 8 NEXT LINE NO.		FREE 99995

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EDUCATION YEAR:
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00 = LESS THAN 1 YEAR COMPLETED
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11 = ROLE MODEL CAREGIVER/ COMMUNITY WORKER
12 = DRUG HAWKER

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELA-TION-SHIP	SEX	RESIDENCE		AGE	WOMEN AGE 15-49		CHILD-REN 0- 5
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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?	How much did the treatment cost?
	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.			USE CODES BELOW.	INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 99990, WRITE '99990'. IF FREE, CIRCLE CODE '99995'. IF DON'T KNOW CODE '99998'

05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = CHEMIST/PMV
13 = SELF TREATMENT AT HOME
96 = OTHER
98 = DOES NOT KNOW

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	What is the **main** source of drinking water for members of your household?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 TUBE WELL OR BOREHOLE . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 BOTTLED WATER . . . . . 91 SACHET WATER/PURE WATER . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 104 → 102 → 102
101A	What is the **main** source of water used by your household for other purposes such as cooking and handwashing?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 TUBE WELL OR BOREHOLE . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 BOTTLED WATER . . . . . 91 SACHET WATER/PURE WATER . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 104
102	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 104
103	How long does it take to go there, get water, and come back?	MINUTES . . . . . ☐☐☐ DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
104	What kind of toilet facility do members of your household **usually** use? IF NOT POSSIBLE TO DETERMINE, ASK PERMISSION TO OBSERVE THE FACILITY.	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)	→ 107
105	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	→ 107
106	Including your own household, how many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . [0] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	
107	Does your household have: a) Electricity? b) A radio? c) A television? d) A mobile telephone? e) A non-mobile telephone? f) A refrigerator? g) A cable TV ? h) A generating set ? i) Airconditioner ? j) A computer ? k) Electric iron ? l) A fan ?	YES NO a) ELECTRICITY . . . . . 1 2 b) RADIO . . . . . 1 2 c) TELEVISION . . . . . 1 2 d) MOBILE TELEPHONE . . . . . 1 2 e) NON-MOBILE TELEPHONE . . . 1 2 f) REFRIGERATOR . . . . . 1 2 g) CABLE TV . . . . . 1 2 h) GENERATING SET . . . . . 1 2 i) AIR CONDITIONER . . . . . 1 2 j) COMPUTER . . . . . 1 2 k) ELECTRIC IRON . . . . . 1 2 l) FAN 1 2	
108	What type of fuel does your household **mainly** use for cooking?	ELECTRICITY . . . . . 01 LIQUID PROPANE GAS/CYLINDER . . . . . 02 NATURAL GAS . . . . . 03 BIOGAS . . . . . 04 KEROSENE . . . . . 05 COAL, LIGNITE . . . . . 06 CHARCOAL . . . . . 07 WOOD . . . . . 08 STRAW/SHRUBS/GRASS/SAWDUST . . . . . 09 AGRICULTURAL CROP . . . . . 10 ANIMAL DUNG . . . . . 11 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
109	**MAIN** MATERIAL OF THE FLOOR.	NATURAL FLOOR EARTH/SAND . . . . . 11 DUNG . . . . . 12 RUDIMENTARY FLOOR WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 FINISHED FLOOR PARQUET OR POLISHED WOOD . . . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
110	**MAIN** MATERIAL OF THE ROOF. RECORD OBSERVATION.	NATURAL ROOFING NO ROOF . . . . . 11 THATCH/PALM LEAF . . . . . 12 SOD . . . . . 13 RUDIMENTARY ROOFING RUSTIC MAT . . . . . 21 PALM/BAMBOO . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 FINISHED ROOFING ZINC / METAL . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	**MAIN** MATERIAL OF THE EXTERIOR WALLS. RECORD OBSERVATION.	NATURAL WALLS NO WALLS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 DIRT . . . . . 13 RUDIMENTARY WALLS BAMBOO WITH MUD . . . . . 21 STONE WITH MUD . . . . . 22 UNCOVERED ADOBE . . . . . 23 PLYWOOD . . . . . 24 CARDBOARD . . . . . 25 REUSED WOOD . . . . . 26 FINISHED WALLS CEMENT . . . . . 31 STONE WITH LIME/CEMENT . . . . . 32 BRICKS . . . . . 33 CEMENT BLOCKS . . . . . 34 COVERED ADOBE . . . . . 35 WOOD PLANKS/SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	
112	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)	
112A	How many rooms in this household are used for sleeping?	ROOMS	
112B	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	
113	Does any member of this household own:	YES NO a) WATCH . . . . . 1 2 b) MOBILE PHONE . . . . . 1 2 c) BICYCLE . . . . . 1 2 d) MOTORCYCLE/SCOOTER . . . 1 2 e) ANIMAL-DRAWN CART . . . . . 1 2 f) CAR/TRUCK . . . . . 1 2 g) BOAT WITH MOTOR 1 2	
	a) A watch?		
	b) A Mobile phone		
	c) A bicycle?		
	d) A motorcycle or motor scooter?		
	e) An animal-drawn cart?		
	f) A car or truck?		
	g) A boat with a motor?		
114	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 116
115	How many hectares of agricultural land do members of this household own? STANDARD PLOT = 60FT X 120 FT (18M X 36M) 1 HECTARE = 6 PLOTS IF 95.0 OR MORE PLOTS RECORD HECTARES IF 95.0 OR MORE HECTARES, CIRCLE '9950'.	PLOTS . . . . . 1 . . HECTARES . . . . . 2 . . 95 OR MORE HECTARES . . . . . 9950 DON'T KNOW 9998	
116	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 118

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
117	How many of the following animals does this household own? IF NONE, ENTER '00'. IF 95 OR MORE, ENTER '95'. IF UNKNOWN, ENTER '98'.		
	Milk cows or bulls?	COWS/BULLS	
	Other Cattle?	OTHER CATTLE	
	Horses, donkeys, or mules?	HORSES/DONKEYS/MULES	
	Goats?	GOATS	
	Sheep?	SHEEP	
	Chickens or other poultry?	CHICKENS/POULTRY	
118	Does any member of this household have a bank account?	YES . . . . . 1 NO 2	
119	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	→ 121
120	Who sprayed the dwelling?	GOVERNMENT WORKER/PROGRAM . . . . . A PRIVATE COMPANY . . . . . B NONGOVERNMENTAL ORGANIZATION (NGO) . . . . . C OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
121	Does your household have any mosquito nets?	YES . . . . . 1 NO 2	→ 122
121A	Did you sleep inside a mosquito net last night?	YES . . . . . 1 NO 2	→ 125
121B	What would encourage you to sleep inside a mosquito net? CIRCLE ALL MENTIONED.	IF NET DID NOT SMELL . . . . . A HAD A DIFFERENT SHAPE/SIZE . . . . . B HAD A DIFFERENT COLOR . . . . . C IF NET WERE NOT ITCHY/IRRITATING . . . D IF NET WERE BIGGER/ NOT CLAUSTROPHOBIC . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	→ 125
122	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 _____ X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
123	Has your household ever owned a mosquito net?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 139
124	Why does your household no longer have a mosquito net? CIRCLE ALL MENTIONED.	NO MOSQUITOES . . . . . A NOT AVAILABLE . . . . . B DON'T LIKE TO USE NETS . . . . . C TOO EXPENSIVE . . . . . D NET WAS OLD . . . . . E THREW AWAY NET . . . . . F HAVE WINDOW NETS . . . . . G OTHER _____ X (SPECIFY)	→ 139
125	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . ☐	

		NET #1	NET #2	NET #3
126	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
127	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
127A	OBSERVE (OR ASK) THE COLOR OF THE MOSQUITO NET	GREEN . . . . . 01 DARK BLUE . . . . . 02 LIGHT BLUE . . . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER ______ 96 (SPECIFY)	GREEN . . . . . 01 DARK BLUE . . . . . 02 LIGHT BLUE . . . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER ______ 96 (SPECIFY)	GREEN . . . . . 01 DARK BLUE . . . . . 02 LIGHT BLUE . . . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER ______ 96 (SPECIFY)
127B	OBSERVE (OR ASK) THE SHAPE OF THE MOSQUITO NET	CONICAL . . . . . 1 RECTANGLE . . . . . 2 OTHER ______ 6 (SPECIFY)	CONICAL . . . . . 1 RECTANGLE . . . . . 2 OTHER ______ 6 (SPECIFY)	CONICAL . . . . . 1 RECTANGLE . . . . . 2 OTHER ______ 6 (SPECIFY)
127C	OBSERVE (OR ASK) THE SIZE OF THE MOSQUITO NET	COT/CRIB . . . . . 1 SINGLE . . . . . 2 DOUBLE . . . . . 3 TRIPLE . . . . . 4 OTHER ______ 6 (SPECIFY)	COT/CRIB . . . . . 1 SINGLE . . . . . 2 DOUBLE . . . . . 3 TRIPLE . . . . . 4 OTHER ______ 6 (SPECIFY)	COT/CRIB . . . . . 1 SINGLE . . . . . 2 DOUBLE . . . . . 3 TRIPLE . . . . . 4 OTHER ______ 6 (SPECIFY)
128	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
128A	Did you get the net through a mass distribution campaign, an antenatal care visit, or during an immunization visit?	YES, CAMPAIGN . . . . . 1 YES, ANC . . . . . 2 YES, IMMUNIZATION . . . . . 3 (SKIP TO 130) NO 4	YES, CAMPAIGN . . . . . 1 YES, ANC . . . . . 2 YES, IMMUNIZATION . . . . . 3 (SKIP TO 130) NO 4	YES, CAMPAIGN . . . . . 1 YES, ANC . . . . . 2 YES, IMMUNIZATION . . . . . 3 (SKIP TO 130) NO 4
129	Where did you obtain this mosquito net?	PRIMARY HEALTH CENTER/ HEALTH POST . . . . . 01 GOVERNMENT HOSPITAL . . . . . 02 PRIVATE HOSPITAL . . . 03 NGO CLINIC . . . . . 04 MISSION CLINIC . . . . . 05 MOSQUE/CHURCH . . . . . 06 PHARMACY . . . . . 07 PATENT MEDICINE STORE . . . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . . . 10 HAWKER . . . . . 11 SCHOOL . . . . . 12 COMMUNITY DIRECTED DISTRIBUTORS (CDD) . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	PRIMARY HEALTH CENTER/ HEALTH POST . . . . . 01 GOVERNMENT HOSPITAL . . . . . 02 PRIVATE HOSPITAL . . . 03 NGO CLINIC . . . . . 04 MISSION CLINIC . . . . . 05 MOSQUE/CHURCH . . . . . 06 PHARMACY . . . . . 07 PATENT MEDICINE STORE . . . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . . . 10 HAWKER . . . . . 11 SCHOOL . . . . . 12 COMMUNITY DIRECTED DISTRIBUTORS (CDD) . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	PRIMARY HEALTH CENTER/ HEALTH POST . . . . . 01 GOVERNMENT HOSPITAL . . . . . 02 PRIVATE HOSPITAL . . . 03 NGO CLINIC . . . . . 04 MISSION CLINIC . . . . . 05 MOSQUE/CHURCH . . . . . 06 PHARMACY . . . . . 07 PATENT MEDICINE STORE . . . . . 08 SHOP/SUPERMARKET . 09 OPEN MARKET . . . . . 10 HAWKER . . . . . 11 SCHOOL . . . . . 12 COMMUNITY DIRECTED DISTRIBUTORS (CDD) . 13 OTHER ______ 96 (SPECIFY) DON'T KNOW 98

		NET #1	NET #2	NET #3
130	Did you buy the net or was it given to you free?	BOUGHT . . . . 1 FREE . . . . 2 (SKIP TO 132) DON'T KNOW 8	BOUGHT . . . . 1 FREE . . . . 2 (SKIP TO 132) DON'T KNOW 8	BOUGHT . . . . 1 FREE . . . . 2 (SKIP TO 132) DON'T KNOW 8
131	How much did you pay for the net? IF DK, WRITE '99998'.	COST IN NAIRA [ ][ ][ ][ ][ ]	COST IN NAIRA [ ][ ][ ][ ][ ]	COST IN NAIRA [ ][ ][ ][ ][ ]
132	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 135) OTHER BRAND . . . . 96 DK BRAND 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 135) OTHER BRAND . . . . 96 DK BRAND 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 135) OTHER BRAND . . . . 96 DK BRAND 98
133	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 135) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 135) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 135) NOT SURE 8
134	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
135	Did anyone sleep inside this mosquito net last night?	YES . . . . 1 (SKIP TO 137) NO . . . . 2 NOT SURE . . . . 8 (SKIP TO 138)	YES . . . . 1 (SKIP TO 137) NO . . . . 2 NOT SURE . . . . 8 (SKIP TO 138)	YES . . . . 1 (SKIP TO 137) NO . . . . 2 NOT SURE . . . . 8 (SKIP TO 138)
136	Why didn't anyone sleep inside 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 NO SPACE TO HANG . . . . . 14 OTHER ______ 96 SPECIFY DON'T KNOW . . . . 98 (SKIP TO 138)	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 NO SPACE TO HANG . . . . . 14 OTHER ______ 96 SPECIFY DON'T KNOW . . . . 98 (SKIP TO 138)	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 NO SPACE TO HANG . . . . . 14 OTHER ______ 96 SPECIFY DON'T KNOW . . . . 98 (SKIP TO 138)

		NET #1	NET #2	NET #3
137	Who slept inside 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 [ ][ ]
138		GO BACK TO 126 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 201.	GO BACK TO 126 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 201.	GO BACK TO 126 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 201.
139	RECORD THE TIME.	HOURS . . . . [ ][ ] MINUTES . . . . [ ][ ]		

21 AUG 2015

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

NIGERIA MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

NATIONAL MALARIA ELIMINATION PROGRAM
NATIONAL POPULATION COMMISSION
NATIONAL BUREAU OF STATISTICS

National Health Research Ethics Committee
Assigned Number NHREC/01/01/2007-30/06/2015

IDENTIFICATION

STATE _____ .....

LOCAL GOVT. AREA _____ .....

LOCALITY _____

ENUMERATION AREA _____ .....

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

CLUSTER NUMBER .....

BUILDING NUMBER .....

HOUSEHOLD HEAD NAME / HOUSEHOLD NUMBER _____

NAME AND LINE NUMBER OF WOMAN _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
				YEAR 2015
INTERVIEWER NAME				INT NO.
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

NAME _____

DATE _____

(NUMBER)

OFFICE EDITOR

KEYED BY

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Greetings. My name is _____ and I am working with National Population Commission (NPopC) and the National Malaria Elimination Program (NMEP). 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 (NHREC), assigned number NHREC/01/01/2007-11/05/2015, for the data collection period of September 2015 to November 2015. Your household was selected for the survey. We would very much appreciate your participation in this survey. This information you provide 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):

NMEP Contact Person: Dr. Nnenna Ezeigwe, National Coordinator;
Email: drninaezeigwe@gmail.com; **Phone:** 08033000296

NPC CONTACT PERSON: Mr. Bolaji Akinsulie, Project Director;
Email: bolajiakinsulie@yahoo.com; Phone: 08023307806

NHREC Contact Person(s): Secretary, NHREC; **Email:** secretary@nhrec.net; **Phone:** 095238367
Desk Officer, NHREC; **Email:** deskofficer@nhrec.net; **Phone:** ----

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 INTERVIEWED . . . . . 1 ↓

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	
102	In what month and year were you born?	MONTH . . . . . ☐☐ DON'T KNOW MONTH . . . . . 98 YEAR . . . . . ☐☐☐☐ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
104	Have you ever attended school?	YES . . . . . 1 NO 2	→ 108
105	What is the highest level of school you attended: primary, secondary, or higher?	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 OR SECONDARY ☐ ↓ 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 given birth?	YES . . . . . 1 NO 2	→ 206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES . . . . . 1 NO 2	→ 204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME . . . . . ☐☐ DAUGHTERS AT HOME . . . . . ☐☐	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES . . . . . 1 NO 2	→ 206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE . . . . . ☐☐ DAUGHTERS ELSEWHERE ☐☐	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very short time?	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 BIRTHS . . . . . ☐☐	
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ☐ NO ☐ → PROBE AND CORRECT 201-208 AS NECESSARY.		
209A	CHECK 208: ONE OR MORE BIRTHS ☐	NO BIRTHS ☐	→ 224
210	Now I'd like to ask you about your more recent births. How many births have you had in the last 6 years? RECORD ALL BIRTHS IN 2010 OR LATER IF NONE, CIRCLE '00.'	TOTAL IN THE LAST 6 YEARS . . . . . ☐☐ NONE 00	→ 224

211 Now I would like to record the names of all your births **in the last six years**, whether still alive or not, starting with the most recent one you had.
RECORD NAMES OF ALL THE BIRTHS IN 2010 OR LATER IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS. IF THERE ARE MORE THAN 5 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE STARTING WITH THE SECOND ROW.

212 What name was given to your (most recent/previous) baby? RECORD NAME. BIRTH HISTORY NUMBER	213 Is (NAME) a boy or a girl?	214 Were any of these births twins?	215 In what day, month, and year was (NAME) born?	216 Is (NAME) still alive?	217 IF ALIVE: How old was (NAME) at (NAME)'s last birthday? RECORD AGE IN COMPLETED YEARS.	218 IF ALIVE: Is (NAME) living with you?	219 IF ALIVE: RECORD HOUSE-HOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 Were there any other live births between (NAME) and (NAME OF PREVIOUS BIRTH), including any children who died after birth?
01	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES . . . . 1 NO . . . . 2 (NEXT BIRTH)	AGE IN YEARS	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER (NEXT BIRTH)	
02	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES . . . . 1 NO . . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
03	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES . . . . 1 NO . . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
04	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES . . . . 1 NO . . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
05	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES . . . . 1 NO . . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
221	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTH(S) IN TABLE.	YES . . . . . 1 NO 2	
222	COMPARE 210 WITH NUMBER OF BIRTHS IN HISTORY: NUMBERS ARE SAME NUMBERS ARE DIFFERENT → (PROBE AND RECONCILE.)		
223	CHECK 215: ENTER THE NUMBER OF BIRTHS IN 2010 OR LATER	NUMBER OF BIRTHS . . . . . ☐ NONE 0	
224	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 226
225	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS . . . . . ☐☐	
226	CHECK 223: ONE OR MORE BIRTHS IN 2010 OR LATER → GO TO 300 NO BIRTHS IN 2010 OR LATER → 501 Q. 223 IS BLANK → 501		

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
300	CHECK 215: ENTER IN THE TABLE THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask some questions about your last pregnancy that resulted in a live birth.		
301	FROM 212 AND 216, LINE 01:	MOST RECENT BIRTH NAME _____ LIVING ☐ DEAD ☐	
302	When you were pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES . . . . . 1 NO 2	→ 304
303	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 VILLAGE HEALTH WORKER(VHW) . . F RURAL MODEL CAREGIVER(RMC) . . G COMMUNITY DIRECTED DISTRIBUTOR (CDD) . . . . . H OTHER _____ (SPECIFY) X	
304	During this pregnancy, did you take SP/Fansidar to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 311
307	How many times did you take SP/Fansidar during this pregnancy?	TIMES . . . . . ☐☐	
308	CHECK 303: ANTENATAL CARE FROM HEALTH PERSONNEL DURING THIS PREGNANCY	CODE 'A', 'B', 'C', OR 'D' CIRCLED ☐ OTHER ☐	→ 311
309	Did you get the SP/Fansidar during any antenatal care visit, during another visit to a health facility or from another source? IF MORE THAN ONE SOURCE, RECORD THE HIGHEST SOURCE ON THE LIST.	ANTENATAL VISIT . . . . . 1 ANOTHER FACILITY VISIT . . . . . 2 COMMUNITY HEALTH EXTENSION WORKER . . . . . 3 OTHER SOURCE 6	
310	Did you receive a mosquito net during an antenatal care visit?	YES . . . . . 1 NO 2	
311	CHECK 215 AND 216:	ONE OR MORE LIVING CHILDREN BORN IN 2010 OR LATER ☐ → GO TO 401 NO LIVING CHILDREN BORN IN 2010 OR LATER ☐	→ 501

SECTION 4. FEVER IN CHILDREN

401	CHECK 212: RECORD THE BIRTH HISTORY NUMBER IN 402 AND THE NAME AND SURVIVAL STATUS IN 403 FOR EACH BIRTH IN 2010-2015. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. Now I would like to ask some questions about the health of your children born since January 2010. (We will talk about each separately.)			
402	BIRTH HISTORY NUMBER FROM 212 IN BIRTH HISTORY	MOST RECENT BIRTH BIRTH HISTORY NUMBER ☐☐	SECOND MOST RECENT BIRTH BIRTH HISTORY NUMBER ☐☐	THIRD MOST RECENT BIRTH BIRTH HISTORY NUMBER ☐☐
403	FROM 212 AND 216	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 425)	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 425)	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 425)
404	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8
404A	Did you suspect that (NAME) had malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
405	At any time during the illness, did (NAME) have blood taken from (NAME)'s 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
405A	Was (NAME) tested for malaria?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 406) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 406) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 406) DON'T KNOW 8
405B	What was the result of the malaria test?	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 DON'T KNOW 8	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 DON'T KNOW 8	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 DON'T KNOW 8
406	Did you seek advice or treatment for the illness from any source?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)

407	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE 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 FREE 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 PVT 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 FREE 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 PVT 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 FREE 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 PVT MOBILE CLINIC . . . . . K OTHER PRIVATE ______ L (SPECIFY) **OTHER SOURCE** SHOP . . . . M TRADITIONAL PRACTITIONER N DRUG HAWKER . O OTHER ______ X (SPECIFY)
NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME ______	SECOND MOST RECENT BIRTH NAME ______	THIRD MOST RECENT BIRTH NAME ______
408	CHECK 407:	TWO OR MORE CODES CIRCLED ☐ ↓ OTHER ☐ (SKIP TO 409A)	TWO OR MORE CODES CIRCLED ☐ ↓ OTHER ☐ (SKIP TO 409A)	TWO OR MORE CODES CIRCLED ☐ ↓ OTHER ☐ (SKIP TO 409A)
409	Where did you first seek advice or treatment? USE LETTER CODE FROM 407.	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐
409A	How many days after the illness began did you first seek advice or treamtent for (NAME)? IF THE SAME DAY RECORD '00'	DAYS . . . . . ☐☐	DAYS . . . . . ☐☐	DAYS . . . . . ☐☐
410	At any time during the illness, did (NAME) take any medicine for the illness?	YES . . . . 1 NO . . . . 2 (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 425) DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME ________	SECOND MOST RECENT BIRTH NAME ________	THIRD MOST RECENT BIRTH NAME ________
411	What medicine did (NAME) take? Any other medicine? RECORD ALL MENTIONED.	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C ARTESUNATE RECTAL . . . . . D INJECTION/IV . E QUININE PILLS . . . . F INJECTION/IV . G ARTEMISININ COMBINATION THERAPY (ACT) . H OTHER ANTI-MALARIAL ________ . . . I (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . J INJECTION . . . K **OTHER DRUGS** PARACETAMOL . L ASPIRIN . . . . M ACETA-MINOPHEN . . . N IBUPROFEN . . . O **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . Z	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C ARTESUNATE RECTAL . . . . . D INJECTION/IV . E QUININE PILLS . . . . F INJECTION/IV . G ARTEMISININ COMBINATION THERAPY (ACT) . H OTHER ANTI-MALARIAL ________ . . . I (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . J INJECTION . . . K **OTHER DRUGS** PARACETAMOL . L ASPIRIN . . . . M ACETA-MINOPHEN . . . N IBUPROFEN . . . O **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . Z	**ANTIMALARIAL DRUGS** SP/FANSIDAR/ AMALAR/ MALOXINE . . . A CHLOROQUINE . B AMODIAQUINE . C ARTESUNATE RECTAL . . . . . D INJECTION/IV . E QUININE PILLS . . . . F INJECTION/IV . G ARTEMISININ COMBINATION THERAPY (ACT) . H OTHER ANTI-MALARIAL ________ . . . I (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . J INJECTION . . . K **OTHER DRUGS** PARACETAMOL . L ASPIRIN . . . . M ACETA-MINOPHEN . . . N IBUPROFEN . . . O **OTHER** ________ X (SPECIFY) **DON'T KNOW** . . . . . Z
412	CHECK 411: ANY CODE A-I CIRCLED?	YES ☐ NO ☐ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425)	YES ☐ NO ☐ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425)	YES ☐ NO ☐ (GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 425)
413	CHECK 411: SP/FANSIDAR/AMALAR/ MALOXINE ('A') GIVEN	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)
414	How long after the fever started did (NAME) first take (SP/Fansidar)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME ________	SECOND MOST RECENT BIRTH NAME ________	THIRD MOST RECENT BIRTH NAME ________
415	CHECK 411: CHLOROQUINE ('B') GIVEN	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)
416	How long after the fever started did (NAME) first take chloroquine?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
417	CHECK 411: AMODIAQUINE ('C') GIVEN	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 418A)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 418A)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 418A)
418	How long after the fever started did (NAME) first take amodiaquine?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
418A	CHECK 411: ARTESUNATE ('D' OR 'E') GIVEN	CODE 'D' OR 'E' CIRCLED ☐ ↓ CODE 'D' OR 'E' NOT CIRCLED ☐ (SKIP TO 419)	CODE 'D' OR 'E' CIRCLED ☐ ↓ CODE 'D' OR 'E' NOT CIRCLED ☐ (SKIP TO 419)	CODE 'D' OR 'E' CIRCLED ☐ ↓ CODE 'D' OR 'E' NOT CIRCLED ☐ (SKIP TO 419)
418B	How long after the fever started did (NAME) first take artesunate?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
419	CHECK 411: QUININE ('F' OR 'G') GIVEN	CODE F' OR 'G' CIRCLED ☐ ↓ CODE 'F' OR 'G' NOT CIRCLED ☐ (SKIP TO 421)	CODE F' OR 'G' CIRCLED ☐ ↓ CODE 'F' OR 'G' NOT CIRCLED ☐ (SKIP TO 421)	CODE F' OR 'G' CIRCLED ☐ ↓ CODE 'F' OR 'G' NOT CIRCLED ☐ (SKIP TO 421)
420	How long after the fever started did (NAME) first take quinine?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME ________________	SECOND MOST RECENT BIRTH NAME ________________	THIRD MOST RECENT BIRTH NAME ________________
421	CHECK 411: ARTEMISININ COMBINATION THERAPY ('H') GIVEN	CODE 'H' CIRCLED [ ] ↓ CODE 'H' NOT CIRCLED [ ] (SKIP TO 423)	CODE 'H' CIRCLED [ ] ↓ CODE 'H' NOT CIRCLED [ ] (SKIP TO 423)	CODE 'H' CIRCLED [ ] ↓ CODE 'H' NOT CIRCLED [ ] (SKIP TO 423)
422	How long after the fever started did (NAME) first take (ARTEMISININ COMBINATION THERAPY)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
423	CHECK 411: OTHER ANTIMALARIAL ('I') GIVEN	CODE 'I' CIRCLED [ ] ↓ CODE 'I' NOT CIRCLED [ ] ↓ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425)	CODE 'I' CIRCLED [ ] ↓ CODE 'I' NOT CIRCLED [ ] ↓ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 425)	CODE 'I' CIRCLED [ ] ↓ CODE 'I' NOT CIRCLED [ ] ↓ (GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 425)
424	How long after the fever started did (NAME) first take (OTHER ANTIMALARIAL)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
425		GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO TO 403 IN MOST RECENT COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501.

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	Have you ever heard of an illness called malaria?	YES . . . . . 1 NO 2	→ 516
502	How can you tell if you have malaria? CIRCLE ALL MENTIONED.	FEVER . . . . . A CHILLS/SHIVERING . . . . . B HEADACHE . . . . . C JOINT PAIN . . . . . D POOR APPETITE . . . . . E VOMITTING . . . . . F CONVULSION . . . . . G COUGH . . . . . H CATARRH/NASAL CONGESTION . . . I OTHER_____ X (SPECIFY) DON'T KNOW . . . . . Z	
503	Who are most at risk to get malaria? CIRCLE ALL MENTIONED.	CHILDREN . . . . . A PREGNANT WOMEN . . . . . B ADULTS . . . . . C ELDERLY . . . . . D EVERYONE . . . . . E DON'T KNOW . . . . . Z	
504	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	
505	Are there ways to avoid getting malaria?	YES . . . . . 1 NO 2	→ 509
506	What are the ways to avoid getting malaria? CIRCLE ALL MENTIONED.	SLEEP INSIDE MOSQUITO NET . . . . . A SLEEP INSIDE 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	
507	What can you do to prevent yourself from getting malaria? CIRCLE ALL MENTIONED.	SLEEP INSIDE MOSQUITO NET . . . . . A SLEEP INSIDE AN ITN/LLIN . . . . . B USE HOME 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 SHUT DOORS/WINDOWS . . . . . J OTHER_____ X (SPECIFY) DON'T KNOW . . . . . Z	

508	What can a pregnant woman do to prevent malaria? CIRCLE ALL MENTIONED.	SLEEP INSIDE MOSQUITO NET . . . . . A SLEEP INSIDE 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	
509	Can malaria be treated?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 512
510	What medicines are used to treat malaria ? CIRCLE ALL MENTIONED.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B ARTESUNATE . . . . . C QUININE . . . . . D ACT . . . . . E ASPIRIN/PANADOL/PARACETAMOL . F ANTIMALARIAL (UNKNOWN COMPONENTS) . . . . . G OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
511	What medicines are used to treat children with malaria? CIRCLE ALL MENTIONED.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . . . B ARTESUNATE . . . . . C QUININE . . . . . D ACT . . . . . E ASPIRIN/PANADOL/PARACETAMOL . F ANTIMALARIAL (UNKNOWN COMPONENTS) . . . . . G OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
512	In the past 6 months, have you seen or heard any messages about malaria?	YES . . . . . 1 NO 2	→ 515
513	What messages about malaria have you seen or heard? CIRCLE ALL MENTIONED.	MALARIA IS DANGEROUS . . . . . A MALARIA CAN KILL . . . . . B MOSQUITOES SPREAD MALARIA . . . C SLEEPING INSIDE A MOSQUITO NET IS IMPORTANT . . . . . D WHO SHOULD SLEEP INSIDE A MOSQUITO NET . . . . . E SEEK TREATMENT FOR FEVER . . . . . F SEEK TREATMENT FOR FEVER PROMPTLY (WITHIN 24 HOURS) . G IMPORTANCE OF HOUSE SPRAYING ... H ENVIRONMENTAL SANITATION ACTIVITIES . . . . . I SEEK TESTING BEFORE TREATMENT FOR MALARIA . . . . . J EARLY REGISTRATION FOR ANC . . . K PREGNANT WOMEN SHOULD TAKE SP/FANSIDAR . . . . . L OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	

514	Where did you hear or see these messages? CIRCLE ALL MENTIONED.	RADIO . . . . . A TELEVISION . . . . . B COMMUNITY HEALTH EXTENSION WORKER (CHEW) . . . . . C VILLAGE HEALTH WORKER(VHW) . . E ROLE MODEL CAREGIVER (RMC) . . . E COMMUNITY DIRECTED DISTRIBUTOR (DCC) . . . . . F MOSQUE/CHURCH . . . . . G TOWN ANNOUNCER . . . . . H COMMUNITY EVENT . . . . . I BILLBOARD . . . . . J POSTER . . . . . K T-SHIRT . . . . . L LEAFLET/FACT SHEET/ BROCHURE . M RELATIVE/FRIEND/NEIGHBOUR SCHOOL . . . . . N SOCIAL MEDIA (FACEBOOK, TWITTER, ETC) . . . . . O ANTENATAL CARE VISIT . . . . . P HEALTH CTR OR HOSPITAL . . . . . Q OTHER _____ X (SPECIFY)	
515	I am going to ask you about your opinion of malaria. Please tell me whether you agree or disagree with the following statements: A. My chances of getting malaria are the same whether or not I sleep inside a treated mosquito net. B. The medicine given to pregnant women to prevent malaria works well to keep the mother healthy. C. The malaria tests are a good way to know if someone really has malaria or not. D. ACTs work quickly to treat malaria.	AGREE / DISAGREE / DON'T KNOW A. 1 2 8 B. 1 2 8 C. 1 2 8 D. 1 2 8	
515A	Did you sleep inside a mosquito net last night?	YES . . . . . 1 NO 2	→ 517
516	What would encourage you to sleep inside a mosquito net?	IF NET DID NOT SMELL . . . . . A HAD A DIFFERENT SHAPE/SIZE . . . . . B HAD A DIFFERENT COLOR . . . . . C IF NET WERE NOT ITCHY/IRRITATING . D IF NET WERE BIGGER/ NOT CLOSTROPHOBIC . . . . . E OTHER _____ F (SPECIFY) DON'T KNOW X	

516A	If you have a choice, what color of mosquito net do you prefer?	GREEN . . . . . 01 DARK BLUE . . . . . 02 LIGHT BLUE . . . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER _____ 96 (SPECIFY) DK/NO PREFERENCE 98	
516B	If you have a choice, what shape of mosquito net do you prefer?	CONICAL . . . . . 1 RECTANGLE . . . . . 2 OTHER _____ 6 (SPECIFY) DK/NO PREFERENCE 8	
516C	If you have a choice, what size of mosquito net do you prefer?	COT/CRIB . . . . . 1 SINGLE . . . . . 2 DOUBLE . . . . . 3 TRIPLE . . . . . 4 OTHER _____ 6 (SPECIFY) DK/NO PREFERENCE 8	
516D	If you have a choice, what brand of mosquito net do you prefer?	PERMANET . . . . . 01 OLYSET . . . . . 02 ICONLIFE . . . . . 03 DURANET . . . . . 04 NETPROTECT . . . . . 05 BASF INTERCEPTOR . . . . . 06 OTHER _____ 96 (SPECIFY) DK/NO PREFERENCE 98	
517	RECORD THE TIME.	HOUR . . . . .  MINUTES	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF SUPERVISOR: _____ DATE: _____

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

NIGERIA MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

NATIONAL MALARIA ELIMINATION PROGRAM
NATIONAL POPULATION COMMISSION
NATIONAL BUREAU OF STATISTICS

National Health Research Ethics Committee
Assigned Number NHREC/01/01/2007-11/05/2015

IDENTIFICATION (INTERVIEWER COMPLETES)

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

LAB SCIENTIST VISITS (LAB SCIENTIST COMPLETES)

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2015)
LAB SCIENTIST NAME				FW NO.
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)

ADDITIONAL INFORMATION (INTERVIEWER COMPLETES)

NAME OF HOUSEHOLD INTERVIEWER: _____

NAME OF TEAM SUPERVISOR: _____

TOTAL ELIGIBLE CHILDREN AGE 0-5 YEARS

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

BIOMARKER QUESTIONNAIRE
HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5 YEARS

19 MARCH 2015

201	CHECK COLUMN 10 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 202. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
202	LINE NUMBER FROM COLUMN 10 NAME FROM COLUMN 2	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________
203	What is (NAME)'s birth date?	DAY . . . . [ ][ ] MONTH . . . . . . [ ][ ] YEAR [ ][ ][ ][ ]	DAY . . . . [ ][ ] MONTH . . . . . . [ ][ ] YEAR [ ][ ][ ][ ]	DAY . . . . [ ][ ] MONTH . . . . . . [ ][ ] YEAR [ ][ ][ ][ ]
204	CHECK 203: CHILD BORN IN JANUARY 2010 OR LATER?	YES . . . . 1 NO . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . 1 NO . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . 1 NO . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)
205	CHECK 203: 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 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) OLDER 2	0-5 MONTHS . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) OLDER 2	0-5 MONTHS . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) OLDER 2
206	NAME OF PARENT/ OTHER ADULT RESPONSIBLE FOR THE CHILD	NAME ________	NAME ________	NAME ________
207	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking children all over the country to take an **anemia** test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2010 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take 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 strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		
208	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED . . . . 1 ________ (SIGN) REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6	GRANTED . . . . 1 ________ (SIGN) REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6	GRANTED . . . . 1 ________ (SIGN) REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6
209	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	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 ask that all children born in 2010 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take 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 or heel prick made for the anemia test). One blood drop will be tested for malaria immediately, and the result will be told to you right away. A few blood drops will be collected on a slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria testing?		
210	CIRCLE THE APPROPRIATE CODE, SIGN YOUR NAME, AND ENTER YOUR FIELDWORKER NUMBER	GRANTED . . . . 1 ________ (SIGN AND ENTER FIELDWORKER NO.) [ ][ ][ ][ ] REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6	GRANTED . . . . 1 ________ (SIGN AND ENTER FIELDWORKER NO.) [ ][ ][ ][ ] REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6	GRANTED . . . . 1 ________ (SIGN AND ENTER FIELDWORKER NO.) [ ][ ][ ][ ] REFUSED . . . . 2 NOT PRESENT . . . . . . 4 OTHER 6

		CHILD 1	CHILD 2	CHILD 3
	NAME FROM COLUMN 2	NAME ________________	NAME ________________	NAME ________________
211	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
212	BAR CODE LABEL FOR MALARIA TEST.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.
213	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	G/DL [ ][ ] . [ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ] . [ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ] . [ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996
214	RECORD RESULT CODE OF THE MALARIA RDT.	TESTED .... 1 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 216)
215	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6
216	CHECK 213: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)
217	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately. **SKIP TO 229**		
218	Does (NAME) suffer from the any of following illnesses or symptoms: Extreme weakness? Heart problems? Loss of consciousness? Rapid or difficult breathing? Seizures? Abnormal bleeding? Jaundice or yellow skin? Dark urine? IF NONE OF THE ABOVE SYMPTOMS, CIRCLE CODE Y	EXTREME WEAKNESS A HEART PROBLEMS ... B LOSS OF CONSCIOUSNESS C RAPID BREATHING ... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NONE OF ABOVE SYMPTOMS .... Y	EXTREME WEAKNESS A HEART PROBLEMS ... B LOSS OF CONSCIOUSNESS C RAPID BREATHING ... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NONE OF ABOVE SYMPTOMS .... Y	EXTREME WEAKNESS A HEART PROBLEMS ... B LOSS OF CONSCIOUSNESS C RAPID BREATHING ... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NONE OF ABOVE SYMPTOMS .... Y
219	CHECK 218: ANY CODE A-H CIRCLED?	ONLY CODE Y CIRCLED .... 1 ANY CODE A-H CIRCLED ...... 2 (SKIP TO 222)	ONLY CODE Y CIRCLED .... 1 ANY CODE A-H CIRCLED ...... 2 (SKIP TO 222)	ONLY CODE Y CIRCLED .... 1 ANY CODE A-H CIRCLED ...... 2 (SKIP TO 222)

		CHILD 1	CHILD 2	CHILD 3
	NAME FROM COLUMN 2	NAME ________	NAME ________	NAME ________
220	CHECK 213: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER 6
221	In the past two weeks has (NAME) taken or is taking [FIRST LINE MEDICATION] **(10)** given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)
222	**SEVERE MALARIA REFERRAL** STATEMENT	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taken to a health facility right away. **SKIP TO 227A**		
223	**ALREADY TAKING [FIRST LINE MEDICATION] REFERRAL STATEMENT**	You have told me that (NAME OF CHILD) has already received ACT for malaria. Therefore, I cannot give you additional ACT. However, the test shows that he/she has malaria. If your child has a fever for two days after the last dose of ACT, you should take the child to the nearest health facility for further examination. **SKIP TO 229**		
224	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD.	The malaria test shows that your child 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 fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
225	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE 1 ________ (SIGN) REFUSED .... 2 OTHER 6	ACCEPTED MEDICINE 1 ________ (SIGN) REFUSED .... 2 OTHER 6	ACCEPTED MEDICINE 1 ________ (SIGN) REFUSED .... 2 OTHER 6
226	CHECK 225: MEDICATION ACCEPTED	ACCEPTED MEDICINE 1 REFUSED .... 2 OTHER .... 6 (SKIP TO 227A)	ACCEPTED MEDICINE 1 REFUSED .... 2 OTHER .... 6 (SKIP TO 227A)	ACCEPTED MEDICINE 1 REFUSED .... 2 OTHER .... 6 (SKIP TO 227A)
227	TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS	(see table below)		

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.

ALSO TELL THE PARENT/ADULT RESPONSIBLE FOR THE CHILD: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in two days, you should take him/her to a health professional for treatment right away.

		CHILD 1	CHILD 2	CHILD 3
227A	CHECK 213: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT ...... 4 REFUSED .... 5 OTHER .... 6 (SKIP TO 229)
227B	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately.		
229	GO BACK TO 203 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			