NIGERIA

Malaria Indicator Survey (MIS)

2021

The Federal Republic of Nigeria

Nigeria
Malaria Indicator Survey
2021

Final Report

National Malaria Elimination Programme
Abuja, Nigeria

National Population Commission
Abuja, Nigeria

The DHS Program
ICF
Rockville, Maryland, USA

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The 2021 Nigeria Malaria Indicator Survey (2021 NMIS) was implemented by the National Malaria Elimination Programme (NMEP) of the Federal Ministry of Health, Nigeria, in collaboration with the National Population Commission (NPC). The funding for the 2021 NMIS was provided by the United States Agency for International Development (USAID) and The Global Fund. ICF provided technical assistance through The DHS Program, a USAID-funded project that provides support and technical assistance in the implementation of population and health surveys in countries worldwide.

Additional information about the 2021 NMIS may be obtained from the headquarters of the National Malaria Elimination Programme (NMEP) of the Federal Ministry of Health, Nigeria, Federal Secretariat Complex, Phase III, Shehu Shagari Way, Central Business District. Abuja. FCT – Nigeria; telephone: +234-9-6712135; email: info@nmep.gov.ng; internet: www.nmcp.gov.ng.

Information about The DHS Program may be obtained from ICF, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA; telephone: +1-301-407-6500; fax: +1-301-407-6501; email: info@DHSprogram.com; internet: www.DHSprogram.com.

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FOREWORD

Malaria is still a major public health challenge in Nigeria, despite substantial efforts to reduce the prevalence and impact of the disease. The last decade of malaria control has witnessed increased support by the Government of Nigeria and its partners to scale up key interventions such as mass campaigns for replacement of insecticide-treated nets (ITNs), intermittent preventive treatment of malaria during pregnancy (IPTp), and malaria case management. There has also been a massive scale up of seasonal malaria chemoprevention, based on the results of the stratification and impact modelling approach for malaria intervention exercise that took place in 2020. The ongoing need is to provide current, evidence-based data on the status of programme implementation and on progress towards malaria control throughout the country.

Nigeria has implemented four National Malaria Strategic Plans (NMSPs) and is presently implementing the fifth NMSP, which covers the period 2021–2025. The 2021–2025 NMSP aims to achieve a parasite prevalence of less than 10% and reduce mortality attributable to malaria to less than 50 deaths per 1,000 live births by 2025. The need to measure the impact of these strategic plans requires 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 2021 NMIS is the third malaria indicator survey conducted in Nigeria, with the first in 2010 and the second in 2015. The 2021 survey is unique in three ways. First, it was conducted in the first year of implementation of the current National Malaria Strategic Plan and therefore provides insights into the impact of the interventions implemented so far and possible revisions of strategies. Second, the survey implementation was conducted during a major pandemic, COVID-19. Finally, the sample size for the 2021 NMIS was much larger than in previous surveys, with a total of 568 clusters covered across the country (195 in urban areas and 373 in rural areas). The 2010 and 2015 surveys covered 240 and 333 clusters, respectively.

It is encouraging to note improvements from previous NMIS surveys in some key indicators. Overall, malaria prevalence fell from 42% in 2010 to 22% in 2021. Ownership of insecticide-treated nets (ITNs) increased from 42% in 2010 to 56% in 2021, while usage among the most vulnerable populations improved from 29% to 41% for children and from 34% to 50% for pregnant women. Among women with a live birth in the 2 years preceding the survey who reported having taken sulfadoxine-pyrimethamine (SP)/Fansidar for the prevention of malaria in pregnancy, 31% received three or more doses, up from 17% in 2018. However, some indicators showed poor performance relative to the results of previous surveys. The impact of COVID-19 may have clouded some of the gains previously recorded. When considering the number of malaria cases and deaths averted between 2000 and 2020 (1.5 billion cases and 7.6 million deaths) according to WHO, we can appreciate the tremendous progress made. However, there is a need to restrategise at the national and subnational levels to ensure that we are on track to achieving the goals of the 2021–2025 NMSP.

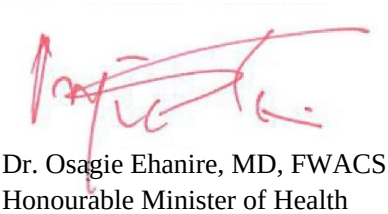
The 2021 NMIS data are disaggregated to provide information by state and geopolitical zone. State-specific indicators will facilitate the enthusiasm for states to continue to develop and implement evidence-based malaria control strategies in the context of the national strategic plan as we move towards malaria elimination.

I would like to use this opportunity to express appreciation to the National Population Commission (NPC) and National Bureau of Statistics (NBS) for working with the National Malaria Elimination Programme (NMEP) and Federal Ministry of Health in the conduct of this important survey. I congratulate the National Malaria Elimination Programme on its success.

My appreciation also goes to ICF for providing technical assistance. I thank PMI-USAID; the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM); and the Health Strategy and Delivery Foundation (HSDF) for providing funding for the survey. State governments, local government authorities, and traditional authorities are well recognized for their contributions and support during survey implementation.

The contributions of the African Network for Drugs and Diagnostics Innovation (ANDI), Department of Medical Microbiology and Parasitology, College of Medicine, University of Lagos, and the Institute of Tropical Disease Research, Prevention, and Control, University of Calabar, Cross River State, as the primary reading and quality control laboratories, respectively, are to be commended.

Finally, I want to express my appreciation to all of the field functionaries for their commitment towards the success of the survey, in spite of challenging circumstances at the time of implementation, as well as the respondents/caregivers and children under age 5 for participating in the survey.



Dr. Osagie Ehanire, MD, FWACS
Honourable Minister of Health

PREFACE

The importance of having appropriate, accurate, and timely data for meaningful planning, programming, and decision making at all levels of governance cannot be overemphasized. To meet this need, the Federal Government of Nigeria, through the National Malaria Elimination Programme (NMEP) and other relevant stakeholders, conducts a malaria indicator survey (MIS) at least every 3 to 4 years.

The 2021 Nigeria Malaria Indicator Survey (NMIS) was implemented by the NMEP in collaboration with the National Population Commission (NPC) and the National Bureau of Statistics (NBS), with technical assistance from ICF. The first NMIS was conducted in 2010 and the second in 2015. The 2021 NMIS is a follow-up to the 2015 NMIS.

The primary objectives of the 2021 NMIS were to provide information on malaria indicators at the national, zonal, and state levels, including the Federal Capital Territory. The survey questions asked about household characteristics, respondents' backgrounds, reproduction, pregnancy, intermittent preventive treatment of malaria during pregnancy, fever management in children, and knowledge of malaria. Blood samples were collected from children age 6–59 months for haemoglobin measurement and malaria testing. Children with positive malaria test results according to rapid diagnostic tests (RDTs) were treated with antimalaria drugs (artemisinin-based combination therapy [ACT]).

The results of this survey not only will provide the NMEP with much-needed data but also will be useful to programme and project managers and policymakers at all levels, development agencies, and nongovernmental organizations within and outside Nigeria.

Dr. M.O Alex – Okoh
Director/Head, Department of Public Health,
Federal Ministry of Health
8 September 2022

ACKNOWLEDGEMENTS

My gratitude goes to the Honourable Minister for Health, Dr. E. Osagie Ehanire, MD, FWACS; the Honourable Minister of State for Health, Dr. (Senator) Adeleke Olorunnimbe Mamora; and the Permanent Secretary, Mahmuda Mamman, for their unwavering support and encouragement in ensuring the implementation of the 2021 Nigeria Malaria Indicator Survey (NMIS) amidst the challenges posed by the COVID-19 pandemic. I also thank the Chairman of the National Population Commission (NPC), Alhaji Nasir Isa Kwarra, and the Statistician General of the National Bureau of Statistics (NBS), Semiu Adeniran, for their great collaboration with the Federal Ministry of Health in the implementation of the survey.

I would like to commend the Director of the Department of Public Health, Federal Ministry of Health, Dr. Morenike Alex-Okoh, for her support and commitment to the success of the survey. The leadership and commitment of the Survey Management Committee and the Survey Implementation Committee are also well acknowledged and appreciated.

I thank the states, local government authorities, and communities and the gatekeepers at these levels for providing the enabling environment for the success of the survey. I also acknowledge the effort of the personnel at the primary testing laboratory (African Network for Drugs and Diagnostics Innovation [ANDI], Department of Medical Microbiology and Parasitology, College of Medicine, University of Lagos) and the secondary laboratory (Institute of Tropical Disease Research, Prevention, and Control, University of Calabar, Cross River State) for the primary reading and quality control of the microscopic slides generated during the survey, respectively.

My appreciation also goes to the PMI/USAID; the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM); and the Health Strategy and Delivery Foundation (HSDF) for providing financial support; and to ICF and the World Health Organization (WHO) for providing technical support for the survey.

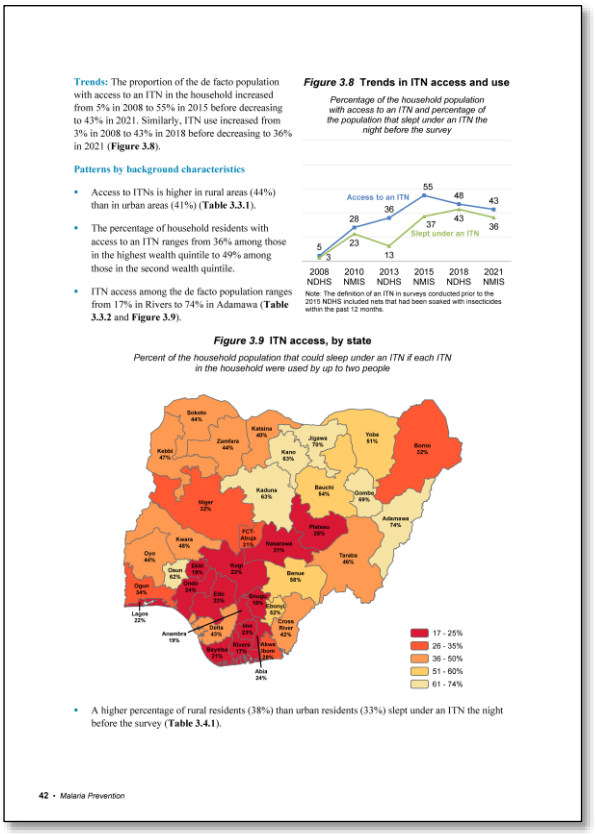
I sincerely appreciate all of the state coordinators, team supervisors, quality control officers, national monitors, data collectors, data processing personnel, drivers, and local guides for their hard work and commitment during the implementation of the survey. Finally, I thank the caregivers and the respondents and children for participating in the survey, enabling the necessary data and blood samples to be collected for analysis and reporting.

Dr. Perpetua Uhomoibhi
National Coordinator,
National Malaria Elimination Programme

READING AND UNDERSTANDING TABLES FROM THE 2021 NIGERIA MALARIA INDICATOR SURVEY (NMIS)

The following pages provide an introduction to the organisation of NMIS tables and the presentation of background characteristics and offer a summary of how to sample and understand denominators. This section also provides exercises for users to practice interpreting NMIS tables.

This report is based on about 60 tables of data, and the tables are located at the end of each chapter instead of being imbedded in the text. While the text and figures featured in each chapter highlight some of the most important findings from the tables, not every finding can be discussed or displayed graphically. For this reason, data users should be comfortable reading and interpreting NMIS tables.



Trends: The proportion of the de facto population with access to an ITN in the household increased from 5% in 2008 to 55% in 2015 before decreasing to 43% in 2021. Similarly, ITN use increased from 3% in 2008 to 43% in 2018 before decreasing to 36% in 2021 (**Figure 3.8**).

Patterns by background characteristics

- Access to ITNs is higher in rural areas (44%) than in urban areas (41%) (**Table 3.3.1**).
- The percentage of household residents with access to an ITN ranges from 36% among those in the highest wealth quintile to 49% among those in the second wealth quintile.
- ITN access among the de facto population ranges from 17% in Rivers to 74% in Adamawa (**Table 3.3.2** and **Figure 3.9**).

Figure 3.8 **Trends in ITN access and use**

Percentage of the household population with access to an ITN and percentage of the population that slept under an ITN the night before the survey

Note: The definition of an ITN in surveys conducted prior to the 2015 NDHS included nets that had been soaked with insecticides within the past 12 months.

Figure 3.9 **ITN access, by state**

Percent of the household population that could sleep under an ITN if each ITN in the household were used by up to two people

- A higher percentage of rural residents (38%) than urban residents (33%) slept under an ITN the night before the survey (**Table 3.4.1**).

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Example 1: Prevalence of Malaria in Children: National

A biomarker measure taken from all eligible respondents

Table 4.8.1 Prevalence of malaria in children: National 1

Percentage of children age 6–59 months classified in two tests as having malaria, according to background characteristics, Nigeria MIS 2021

3 Background characteristic	2 Malaria prevalence according to RDT: RDT positive	Malaria prevalence according to RDT: Number of children	Malaria prevalence according to microscopy: Microscopy positive	Malaria prevalence according to microscopy: Number of children
Age in months				
6–8	20.9	582	11.1	577
9–11	23.7	489	14.8	486
12–17	33.1	1,175	16.7	1,164
18–23	31.2	987	14.6	978
24–35	39.3	2,367	20.6	2,355
36–47	44.2	2,549	24.4	2,533
48–59	47.6	2,954	29.9	2,944
Sex				
Male	40.5	5,701	22.3	5,668
Female	38.6	5,402	22.2	5,369
Mother's interview status				
Interviewed	38.6	9,587	21.6	9,536
Not interviewed and not in the household[1]	46.2	1,516	26.5	1,501
Residence				
Urban	25.0	3,006	10.5	2,996
Rural	45.0	8,097	26.7	8,041
Zone				
North Central	32.3	1,916	17.0	1,899
North East	43.0	1,991	20.1	1,983
North West	51.6	3,967	29.8	3,940
South East	27.3	902	18.7	895
South South	29.9	1,196	17.8	1,192
South West	24.1	1,131	16.2	1,128
Mother's education[2]				
No education	52.1	4,375	30.4	4,345
Primary	42.3	1,481	22.6	1,472
Secondary	24.1	2,797	13.1	2,789
More than secondary	13.0	933	4.5	929
Wealth quintile				
Lowest	55.4	2,431	31.3	2,414
Second	53.6	2,416	32.3	2,395
Middle	40.1	2,321	23.1	2,309
Fourth	28.7	2,035	14.6	2,030
Highest	12.8	1,900	5.3	1,889
Total	4 39.6	11,103	22.3	11,037

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RDT = Rapid diagnostic test (SD BIOLINE P.f)
[1] Includes children whose mothers are deceased
[2] Excludes children whose mothers were not interviewed

Step 1: Read the title and subtitle highlighted in orange in Example 1. They tell you the topic and the specific population group being described. In this case, the table is about children age 6–59 months who were tested for malaria.

Step 2: Scan the column headings highlighted in green in Example 1. They describe how the information is categorised. In this table, the first column of data shows children who tested positive for malaria according to a rapid diagnostic test (RDT). The second column lists the number of children in the survey age 6–59 months who were tested for malaria using RDT. The third column shows children who tested positive for malaria according to microscopy. The last column lists the number of children in the survey age 6–59 months who were tested for malaria using microscopy.

Step 3: Scan the row headings in the first vertical column highlighted in blue in Example 1. These show the different ways the data are divided into categories based on background characteristics. In this case, the table presents the prevalence of malaria by age, sex, mother's interview status, urban-rural residence, zone,

mother's educational level, and wealth quintile. Most of the tables in the NMIS report will be divided into these categories.

Step 4: Look at the row at the bottom of the table highlighted in red in Example 1. These percentages represent the totals of children age 6–59 months who tested positive for malaria according to the different tests. In this case, 39.6%* of children age 6–59 months tested positive for malaria according to RDT, while 22.3% tested positive for malaria according to microscopy.

Step 5: Draw two imaginary lines, as shown on the table, to find out what percentage of children age 6–59 months whose mothers had more than a secondary education tested positive for malaria according to microscopy. This shows that 4.5% of children age 6–59 months whose mothers had more than a secondary education tested positive for malaria according to microscopy.

Step 6: Look at the patterns in the table. By looking at patterns by background characteristics, we can see how malaria prevalence varies across Nigeria. Resources are often limited. Knowing how malaria prevalence varies across groups can help programme planners and policymakers determine how to use resources effectively.

Practice: Use the table in Example 1 to answer the following questions about malaria prevalence:

a) Is malaria prevalence according to RDT higher among boys or girls?
b) Is there a clear pattern in RDT malaria prevalence by age?
c) What are the lowest and highest percentages (the range) of malaria prevalence by microscopy by zone?
d) Is there a clear pattern in RDT malaria prevalence by mother's educational level?
e) Is there a clear pattern in malaria prevalence by microscopy by wealth quintile?

Answers:
a) Boys; 40.5%.
b) Yes, malaria prevalence increases with age: 20.9% of children age 6–8 months were positive for malaria according to RDT, as compared with 47.6% of children age 48–59 months.
c) Malaria prevalence by microscopy is lowest in South West (16.2%) and highest in North West (29.8%).
d) Yes, malaria prevalence by RDT decreases with increasing mother's education; the highest prevalence is 52.1% among children whose mothers have no education, and the lowest prevalence is 13.0% among children whose mothers have more than a secondary education.
e) Yes, malaria prevalence by microscopy decreases as household wealth increases; malaria prevalence by microscopy is highest in the lowest wealth quintile (31.3%) and lowest in the highest wealth quintile (5.3%).

* For the purpose of this document, data are presented exactly as they appear in the table—including decimal places. However, data are rounded to the nearest whole percentage point in the remainder of the report.

Example 2: Use of mosquito nets by pregnant women: States

A question asked of a subgroup of survey respondents

Table 3.7.2 Use of mosquito nets by pregnant women: States 1

Percentage of pregnant women age 15–49 who slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among pregnant women age 15–49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, by state, Nigeria MIS 2021

State	2 Among pregnant women age 15–49 in all households			Among pregnant women age 15–49 in households with at least one ITN[1]	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
North Central					
FCT-Abuja	*	*	11	*	9
Benue	*	*	24	*	19
Kogi	*	*	16	*	8
Kwara	(42.8)	(42.8)	25	*	19
Nasarawa	(23.4)	(19.5)	27	*	12
Niger	(30.7)	(30.7)	53	(53.6)	31
Plateau	(26.6)	(26.6)	27	*	9
North East					
Adamawa	(72.8)	(72.8)	26	(86.1)	22
Bauchi	71.1	71.1	99	(89.8)	79
Borno	(56.6)	(55.3)	23	*	15
Gombe	*	*	12	*	10
Taraba	(52.1)	(52.1)	20	(58.4)	18
Yobe	59.3	59.3	67	(83.9)	47
North West					
Jigawa	(86.0)	(86.0)	57	(88.6)	56
Kaduna	60.8	60.8	95	72.5	79
Kano	76.9	76.9	99	93.0	82
Katsina	51.4	51.4	194	80.9	123
Kebbi	54.1	50.6	81	(66.1)	62
Sokoto	(45.3)	(40.1)	50	(56.9)	36
Zamfara	65.5	56.9	39	(74.8)	30
South East					
Abia	*	*	9	*	2
Anambra	(5.7)	(5.7)	19	*	4
Ebonyi	(66.5)	(66.5)	25	*	19
Enugu	*	*	8	*	2
Imo	*	*	12	*	3
South South					
Akwa Ibom	*	*	16	*	9
Bayelsa	(22.9)	(22.9)	12	*	5
Cross River	*	*	17	*	11
Delta	*	*	18	*	11
Edo	*	*	19	*	2
Rivers	(1.4)	(1.4)	12	*	3
South West					
Ekiti	*	*	5	*	1
Lagos	*	*	30	*	20
Ogun	*	*	12	*	8
Ondo	*	*	14	*	4
Osun	*	*	20	*	9
Oyo	*	*	24	*	16
Total	50.4	49.6	1,320	73.2	895

a b 3 4

Notes: Table is based on women who stayed in the household the night before the interview. Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Step 1: Read the title and subtitle. In this case, the table is about two separate groups of pregnant women age 15–49: pregnant women in all households (a) and pregnant women in households with at least one ITN (b).

Step 2: Identify the two panels. First, identify the columns that refer to pregnant women age 15–49 in all households (a), and then isolate the columns that refer only to pregnant women age 15–49 in households with at least one ITN (b).

Step 3: Look at the first panel. What percentage of pregnant women age 15–49 in all households were interviewed? 1,320. Now look at the second panel. How many pregnant women age 15–49 in households with at least one ITN were interviewed? 895. The second panel is a subset of the first panel.

Step 4: Look across the state rows and note any cells with asterisks or with percentages in parentheses. When these pregnant women are further divided into the state categories, there may be too few cases for the percentages to be reliable.

- What percentage of pregnant women age 15–49 in all households in Bayelsa slept under an ITN the night before the survey? 22.9%. This percentage is in parentheses because there are between 25 and 49 cases (unweighted) in this category. You should use this number with caution—it may not be reliable. (See Example 3 for more information on weighted and unweighted numbers.)

- What percentage of pregnant women age 15–49 in households in Abia with at least one ITN slept under an ITN the night before the survey? There is no number in this cell—only an asterisk. This is because fewer than 25 pregnant women age 15–49 were interviewed in the survey. Results for this group are not reported. The subgroup is too small, and so the data are not reliable.

When parentheses or asterisks are used in a table, the explanation will be noted in the footnote. If there are no parentheses or asterisks in a table, you can proceed with confidence that enough cases were included in all categories for the data to be reliable.

Example 3: Understanding Sampling Weights in NMIS Tables

A sample is a group of people who have been selected for a survey. In the NMIS, the sample is designed to represent the national population age 15–49. In addition to national data, most countries want to collect and report data on smaller geographical or administrative areas. However, doing so requires a minimum sample size per area. For the 2021 NMIS, the survey sample is representative at the national and zonal levels and for urban and rural areas.

Table 2.11.1 Background characteristics of respondents: National

Percent distribution of women age 15–49 by selected background characteristics, Nigeria MIS 2021

Background characteristic	Weighted percent	Weighted number	Unweighted number
Zone			
North Central	16.4	2,377	2,674
North East	16.6	2,399	2,523
North West	33.4	4,832	3,635
South East	7.7	1,111	1,523
South South	12.0	1,734	2,148
South West	14.0	2,023	1,973
Total	100.0	14,476	14,476

3 2 1

To generate statistics that are representative of the country as a whole and the six zones, the number of women surveyed in each zone should contribute to the size of the total (national) sample in proportion to the size of the zone. However, if some zones have small populations, then a sample allocated in proportion to each zone's population may not include sufficient women from each district for analysis. To solve this problem, zones with small populations are oversampled. For example, let's say that you have enough money to interview 14,476 women and want to produce results that are representative of Nigeria as a whole and its zones (as in Table 2.11.1). However, the total population of Nigeria is not evenly distributed among the zones: some zones, such as North West, are heavily populated while others, such as South East, are not. Thus, South East must be oversampled.

To get reliable statistics, a sampling statistician determines how many women should be interviewed in each zone. The blue column (1) in the table above shows the actual number of women interviewed in each zone. Within the zones, the number of women interviewed ranges from 1,523 in South East to 3,635 in North West. The number of interviews is sufficient to get reliable results in each zone.

With this distribution of interviews, some zones are overrepresented and some are underrepresented. For example, the population in North West is 33.4% of the population in Nigeria, while South East's population contributes only 7.7% of the population in Nigeria. The population in North West is about four times greater than that of South East, but the blue column shows that the NMIS interviewed only slightly more than two times the number of women in North West (3,635) than South East (1,523). This unweighted distribution of women does not accurately represent the population.

To get statistics that are representative of Nigeria, the distribution of the women in the sample needs to be weighted (or mathematically adjusted) so that it resembles the true distribution in the country. Women from small zones, like South East, should contribute only a small amount to the national total. Women from large zones, like North West, should contribute much more. Therefore, DHS statisticians mathematically calculate a "weight" that is used to adjust the number of women from each zone so that each zone's contribution to the total is proportional to the actual population of the zone. The numbers in the purple column (2) represent the "weighted" values. The weighted values can be smaller or larger than the unweighted values at the zonal level. The total national sample size of 14,476 women has not changed after weighting, but the distribution of the women in the zones has been changed to represent their contribution to the total population size.

How do statisticians weight each category? They take into account the probability that a woman was selected in the sample. If you were to compare the green column (3) to the actual population distribution of Nigeria, you would see that women in each zone are contributing to the total sample with the same weight that they contribute to the population of the country. The weighted number of women in the survey now accurately represents the proportion of women who live in North West and the proportion of women who live in South East.

With sampling and weighting, it is possible to interview enough women to provide reliable statistics at the national and zonal levels. In general, only the weighted numbers are shown in each of the NMIS tables, so do not be surprised if these numbers seem low: they may represent a larger number of women interviewed.

ACRONYMS AND ABBREVIATIONS

ACSM	advocacy communication and social mobilisation change
ACT	artemisinin-based combination therapy
ADH	Africa Data Hub
AFENET	African Field Epidemiology Network
ANC	antenatal care
ANDI	African Network for Drug and Device Innovation
BA-N	Breakthrough Action, Nigeria
BMGF	Bill & Melinda Gates Foundation
CAPI	computer-assisted personal interviewing
CCM	Country Coordinating Mechanism
CDC	Centers for Disease Control and Prevention
CHW	community health worker
CMUL	College of Medicine, University of Lagos
CRS	Catholic Relief Services
CSPro	Census and Survey Processing System
DFID	Department for International Development
DHS	Demographic and Health Survey
DPH/FMoH	Department of Public Health, Federal Ministry of Health
EA	enumeration area
EAD	Enumeration Area Demarcation
EQC	external quality control
FCT	Federal Capital Territory
FMoH	Federal Ministry of Health
g/dl	grams per decilitre
GF	Global Fund
GFATM	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GF-CT	Global Fund-Country Team
GPS	Global Positioning System
HMH	Honourable Minister of Health
HRP	histidine-rich protein
HSDF	Health Strategy and Delivery Foundation
IFSS	Internet File Streaming System
IPTp	intermittent preventive treatment (of malaria) in pregnancy
ITN	insecticide-treated net
JMP	Joint Monitoring Programme for Water Supply, Sanitation and Hygiene

LGA	local government area
LLIN	long-lasting insecticidal net
LPG	liquefied petroleum gas
MADETS	Malaria Data Entry and Tracking System
MC	Malaria Consortium
MIS	Malaria Indicator Survey
MLSCN	Medical Laboratory Science Council of Nigeria
MSH	Management Sciences for Health
NBS	National Bureau of Statistics
NDHS	Nigeria Demographic and Health Survey
NGO	nongovernmental organization
NHREC	National Health Research Ethics Committee of Nigeria
NMEP	National Malaria Elimination Programme
NMIS	Nigeria Malaria Indicator Survey
NMSP	National Malaria Strategic Plan
NPC	National Population Commission
NPHCDA	National Primary Health Care Development Agency
Pf	*Plasmodium falciparum*
PHC	Population and Housing Census
Pm	*Plasmodium malariae*
PMI-S	U.S. President's Malaria Initiative for States
Po	*Plasmodium ovale*
PPMV	proprietary medicine vendor
PSU	primary sampling unit
RDT	rapid diagnostic test
SBC	social and behaviour change
SDG	Sustainable Development Goal
SIC	Survey Implementation Committee
SMC	Survey Management Committee
SMEOR/NMEP	Surveillance, Monitoring, Evaluation and Operations Research, National Malaria Elimination Programme
SP	sulphadoxine-pyrimethamine
TD/NMEP	Technical Director, National Malaria Elimination Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VIP	ventilated improved pit
WHO	World Health Organization

NIGERIA

** Denotes oversampled area - see Chapter 1 for more information*

INTRODUCTION AND SURVEY METHODOLOGY 1

The 2021 Nigeria Malaria Indicator Survey (NMIS) was implemented by the National Malaria Elimination Programme (NMEP) of the Federal Ministry of Health (FMoH) in collaboration with the National Population Commission (NPC) and National Bureau of Statistics (NBS). Following pre-survey activities (e.g., planning meetings, review of questionnaires, household listing, laboratory assessment, and recruitment and training of field personnel), data collection took place from 12 October to 4 December 2021. ICF provided technical assistance through The Demographic and Health Surveys (DHS) Program, which is funded by the United States Agency for International Development (USAID) and offers financial support and technical assistance for population and health surveys in countries worldwide. The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) also facilitated the implementation of the survey through financial support.

1.1 SURVEY OBJECTIVES

The primary objective of the 2021 NMIS was to provide up-to-date estimates of basic demographic and health indicators related to malaria. Specifically, the NMIS collected information on vector control interventions (such as mosquito nets), intermittent preventive treatment of malaria in pregnant women, exposure to messages on malaria, care-seeking behaviour, treatment of fever in children, and social and behaviour change communication (SBCC). Children age 6–59 months were also tested for anaemia and malaria infection. The information collected through the NMIS is intended to assist policymakers and programme managers in evaluating and designing programmes and strategies for improving the health of the country's population.

1.2 SAMPLE DESIGN

The sample for the 2021 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, which include 36 states and the Federal Capital Territory (FCT). Nigeria's geopolitical zones are as follows:

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

The 2021 NMIS used the sample frame for the proposed 2023 Population and Housing Census (PHC) of the Federal Republic of Nigeria. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), each LGA is divided into wards, and each ward is divided into localities. Localities are further subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster unit for the 2021 NMIS, was defined on the basis of EAs for the proposed 2023 PHC.

A two-stage sampling strategy was adopted for the 2021 NMIS. In the first stage, 568 EAs were selected with probability proportional to the EA size. The EA size is the number of households residing in the EA. The sample selection was done in such a way that it was representative of each state. The result was a total of 568 clusters throughout the country, 195 in urban areas and 373 in rural areas.

A complete listing of households in these clusters was conducted between 26 August and 18 September 2021, with the resulting lists of households serving as the sampling frame for the selection of households in the second stage. GPS dongles were used to capture coordinates during household listing in the 2021 NMIS sample clusters.

In the second stage's selection process, 25 households were selected in each cluster via equal probability systematic sampling. The 2021 NMIS was also designed to provide baseline information on malaria parasite prevalence and other malaria indicators for Bonny Island, which lies in Rivers State. There is an effort to declare the island malaria free in the near future, and it was critical to have baseline information. Oversampling was done for Bonny Island to be able to measure a decline in rapid diagnostic test (RDT) malaria prevalence from 22.3% (the prevalence in Rivers State according to the 2018 Nigeria Demographic and Health Survey [NDHS]) to zero. A total of 25 clusters were selected from Rivers State, with eight clusters selected from Bonny Island and the remaining 17 from the other LGAs in the state.

1.3 QUESTIONNAIRES

Three questionnaires were used in the 2021 NMIS: the Household Questionnaire, the Woman's Questionnaire, and the Biomarker Questionnaire. The questionnaires, based on The DHS Program's model questionnaires, were adapted to reflect the population and health issues relevant to Nigeria. After the questionnaires were finalised in English, they were translated into Hausa, Yoruba, and Igbo. The survey protocol was reviewed and approved by the National Health Research Ethics Committee of Nigeria (NHREC) and the ICF Institutional Review Board.

The Household Questionnaire listed all members of and visitors to selected households. Basic demographic information was collected on each person listed, including age, sex, marital status, education, and relationship to the head of the household. Data on age and sex of household members were used to identify women who were eligible for individual interviews. The Household Questionnaire also collected information on characteristics of the household's dwelling unit such as source of drinking water; type of toilet facilities; materials used for flooring, external walls, and roofing; ownership of various durable goods; and ownership of mosquito nets.

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

- Background characteristics (including age, education, and media exposure)
- Reproduction (birth history and child mortality)
- Pregnancy and intermittent preventive treatment
- Fever in children
- Malaria knowledge and beliefs

The Biomarker Questionnaire was used to record results of anaemia and malaria rapid diagnostic testing of children age 6–59 months.

Another questionnaire, the Fieldworker Questionnaire, was used to collect basic background information on field functionaries collecting data in the field, including team supervisors, interviewers, and medical laboratory scientists (biomarker specialists). Each interviewer completed the self-administered questionnaire after the final selection of interviewers and prior to commencement of fieldwork.

The 2021 NMIS used computer-assisted personal interviewing (CAPI) for data collection.

1.4 ANAEMIA AND MALARIA TESTING

Blood samples for biomarker testing were collected via finger or heel pricks from children age 6–59 months. Each field team included one medical laboratory scientist (biomarker specialist) who carried out

the anaemia and malaria testing and prepared the blood smears. A nurse provided malaria medications for children who tested positive for malaria by RDT, in accordance with the approved treatment guidelines. The biomarker specialist requested informed consent for both tests from the child's parent or guardian before blood samples were collected.

Anaemia testing. A single-use retractable, spring-loaded, sterile lancet was used to make a finger prick (or a heel prick in the case of children age 6–11 months), and a drop of blood from this site was then collected in a microcuvette. Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue®201+ device. Results were provided to the child's parent or guardian verbally and in writing and were recorded in the Biomarker Questionnaire. Parents of children with a haemoglobin level below 8 g/dl (classified as severe anaemia) were provided with a referral and instructed to take the child to a nearby health facility for follow-up care.

Malaria testing using a rapid diagnostic test (RDT). Another drop of blood, taken from the same finger or heel prick that was used for anaemia testing, was tested immediately using the Nigeria-approved SD BIOLINE Malaria Ag P.f. (HRP-II)™ RDT. This qualitative test detects the histidine-rich protein II antigen of *Plasmodium falciparum* in human whole blood. The *P. falciparum* parasite, transmitted by the *Anopheles* mosquito, is the major cause of malaria in Nigeria. The diagnostic test includes a disposable sample applicator that comes in a standard package. A tiny volume of blood is captured on the applicator and placed in the well of the testing device. All biomarker specialists were trained to perform the RDT in the field, in accordance with manufacturers' instructions. RDT results were available in 15 minutes and recorded as either positive or negative, with faint test lines considered positive. As with anaemia testing, RDT results were provided to the child's parent or guardian verbally and in written form and were recorded on the Biomarker Questionnaire.

Children who tested positive for malaria according to the RDT and who had been treated with artemisinin-based combination therapy (ACT) within 2 weeks before the day of the interview were referred to a health facility if they continued to have a fever 2 days after the last dose of ACT. In addition, children who tested positive according to the RDT and met one of the following two criteria—a haemoglobin level below 8 g/dl or symptoms indicative of severe malaria—were considered to have severe malaria and were referred to a health facility for immediate treatment and care. Children who tested positive for uncomplicated malaria were offered a full course of medication according to the standard treatment guidelines in Nigeria. Age-appropriate doses of ACT were provided to the caregiver/mother, along with instructions on how to administer the medicine to the child.

Malaria testing by microscopy. In addition to the RDT, thick and thin blood smears were prepared in the field. Each blood smear slide was given a barcode label, with a duplicate affixed to the Biomarker Questionnaire. An additional copy of the barcode label was affixed to a microscope slide transmittal form to track blood smears from the field to the laboratory. The slides were dried in a dust-free environment and stored in slide boxes. The thick and thin smear slides were collected regularly from the field and transported to 18 staining laboratories nearest to the place of collection, where they were stained with Giemsa stain. The slides were then moved to the African Network for Drug and Device Innovation (ANDI) Centre of Excellence in Lagos for logging, storage, and microscopic reading.

The blood smears were examined to determine the presence or absence of *Plasmodium* parasites and to determine parasite density. Blood smears were considered negative if no parasites were found after 100 high-powered fields had been counted. If parasites were present, the microscopist counted both asexual parasites and white blood cells. All stained slides were read by two independent microscopists. Slides with discrepant results were reanalysed by a third microscopist to determine the final result. Slides were tracked from their arrival in the lab through the examination process using the Malaria Data Entry and Tracking System (MADETS), a Census and Survey Processing System (CSPro) application developed by The DHS Program.

The microscopy results were quality checked through internal and external quality control processes. Routine internal quality control was performed following laboratory standard operating procedures. External quality control was conducted by the University of Calabar Teaching Hospital, which independently read 10% of the slides. The external quality control testing yielded 93% agreement between the ANDI Centre of Excellence and University of Calabar Teaching Hospital results. More information is provided in Appendix C, Tables C.10 and C.11.

Additionally, drops of blood were collected on Whatman filter paper for malaria genomic sequencing. The results are not shown in this report.

1.5 SURVEY IMPLEMENTATION IN THE CONTEXT OF COVID-19

The 2021 NMIS was initially planned for 2020 but had to be postponed to 2021 due to the COVID-19 pandemic, based on the recommendation of the Survey Implementation Committee (SIC). Nigeria reported its first COVID-19 case in February 2020. Subsequently, a lockdown of activities across the country was imposed and various guidelines were released by the Presidential Task Force on COVID-19 for conduct of daily activities within the country (Nigeria Presidential Task Force on COVID-19 2020). The guidelines included limiting gatherings to either 50% capacity or 50 persons, wearing face masks in public places, limiting the number of passengers in vehicles to 50% capacity, using hand sanitiser in public places, and monitoring temperature before entry in public places. Other measures included a ban on international travel and testing of persons with symptoms of COVID-19 at different testing points. With a reported reduction in number of cases in 2021, the SIC, following the approval of the Survey Management Committee (SMC) led by the Honourable Minister of Health, resumed activities for the NMIS in 2021. A COVID-19 mitigation plan for the NMIS was subsequently developed. The plan included procurement and provision of personal protective equipment for all personnel, use of extra halls for training to ensure that training rooms were not congested, daily temperature screening for all participants, provision of hand sanitiser for participants, and provision of an additional vehicle for each survey team. To prevent a shortfall of team members who could become infected during the course of the survey, additional interviewers who served as reserve team members were trained.

1.6 TRAINING OF TRAINERS AND PRETEST

The pretest training was designed to prepare the trainers for the main training, as well as to ensure that they were well versed with the NMIS questionnaires and procedures, and were able to test the questionnaires in the different languages. The training, which incorporated different training manuals (interviewer manual, supervisor manual, biomarker manual, CAPI manual, fieldworker handbook), involved sessions in which NMIS questionnaires were administered and a separate session for biomarker data collection. Thirty-one participants (20 state coordinators, two central coordinators, six biomarker coordinators, and three data processing staff) took part in the pretest training and field practice. The pretest took place over a 2-week period from 6 to 18 September 2021. Most of the participants had previous experience carrying out the NDHS, the NMIS, or other population-based surveys. The idea behind having the data processing staff participate in the pretest was to familiarise them with the CAPI system.

The training, conducted in conjunction with ICF staff, focused on key components of the survey, interview techniques and procedures for completing the NMIS questionnaires, biomarker data collection, and administration of interviews using the CAPI system. The biomarker training included training on testing for anaemia and malaria and how to prepare malaria blood smears. Participants worked in groups using various training techniques, including interactive question-and-answer sessions, case studies, and role-plays. Before starting the fieldwork, participants were given ample opportunities to practice how to administer the questionnaires and practice collection of biomarkers among children. Participants administered questionnaires in the field, provided feedback on the content and language of the questionnaires, tested the CAPI software programme, commented on the biomarker procedure, and learned various training techniques.

The field practice for the pretest was carried out in communities in nearby non-sampled locations where residents spoke English, Hausa, Yoruba, and Igbo. Following the field practice, a debriefing session was held, and modifications to the questionnaires and CAPI skip patterns were made based on lessons learned from the exercise.

1.7 Training of Field Staff

The main training for the 2021 NMIS started on 20 September 2021 and lasted until 7 October 2021. The training included 3 weeks of orientation on data collection instruments and procedures followed by field practice. The 214 participants for the main training were selected through a strict vetting process at the national level. Applicants' curricula vitae received from states were assessed critically based on set criteria, and those who met requirements were further interviewed virtually before they were chosen for the main training. Participants came from all 36 states and the Federal Capital Territory and represented major language groups within the country. Most of the candidates had previous survey fieldwork experience, and some had experience gained through previous rounds of the NDHS and NMIS.

Twenty state coordinators (10 from NMEP, nine from NPC, and one from NBS) who had participated in the pretest training and training of trainers facilitated the training with ICF staff and provided technical support. A total of 37 nurses, 47 medical laboratory scientists (biomarker specialists), 12 quality control officers, and 118 data collectors were trained.

The participants were divided into eight classrooms of about 27 participants, with at least three facilitators for each class. The training sessions included discussions of concepts, procedures, and methodologies for conducting the NMIS survey. Participants were guided through the questionnaires using various training techniques such as role-plays, age probing in pairs, group discussions, in-class exercises, case studies, and presentations. The training also included discussions of the CAPI system, demonstrations of the CAPI DHS menus, and practice in conducting interviews through the CAPI system.

The biomarker training utilised a variety of learning tools. Plenary lectures were held on the technical aspects of data collection and biomarker collection. Other tools used included video and hands-on demonstrations on the process of biomarker collection, instructions on how to fill out the questionnaires and transmittal sheets, and instructions on data quality procedures. In addition, break-out sessions were held at which trainees had the opportunity for hands-on practice with both adults and children. They also had training on using rapid test kits to test for malaria, conducting anaemia testing, and preparing slides for malaria parasitaemia. The nurses, who were also trained on conducting interviews, later joined the biomarker specialists for training on treatment procedures for malaria-positive cases.

All participants were evaluated at intervals through in-class exercises, quizzes, and observations made during field practice. In the end, 37 supervisors were selected based on their performance and previous experience. The team supervisors received additional training on providing logistical support, managing field teams, observing interviews, keeping an inventory of supplies, and collecting biomarker data. They also received additional training on performing supervisory activities with the CAPI system, data quality control procedures, fieldwork coordination and management. In addition, they received training on assigning households and receiving completed interviews from the interviewers, recognizing and dealing with error messages, receiving system updates, distributing updates to interviewers, entering Biomarker Questionnaires, implementing re-visit questionnaires, resolving duplicated cases, and closing clusters. Furthermore, they were trained on transferring completed interviews to the central office via the secure Internet File Streaming System (IFSS) developed by The DHS Program.

1.8 Fieldwork

Fieldworkers were grouped into 37 teams, each team consisting of one supervisor, one medical laboratory scientist/biomarker specialist, one nurse/interviewer, and two interviewers. Overall, 37 supervisors, 74 female interviewers, 37 biomarker specialists, and 37 nurses were deployed (a total of 185 personnel). Five

biomarker specialists and five nurses were kept as reserves. Following deployment, each team developed a schedule to visit the various clusters selected. Prior to fieldwork, each team had entry meetings with the respective states' Ministries of Health and offices of the National Population Commission. Advocacy visits were paid to key community gatekeepers at the community level to enable smooth entrance of the survey team and increase acceptance by community members.

Data collection lasted from 12 October to 4 December 2021. The fieldwork in some states took longer than expected due to the security situation and delays in household listing. During fieldwork, blood from finger pricks (or heel pricks among children age 6–11 months) was collected from eligible children (6–59 months) for rapid diagnostic testing, anaemia testing, and thin and thick film preparation. The slides were counted, recorded in the transmittal sheet, signed, and then sent to staining sites; subsequently, they were transported to the ANDI Centre of Excellence, the primary slide reading laboratory. The teams were closely monitored by the state coordinators, zonal biomarker representatives, quality control officers, and national monitors. The monitors were given orientation and provided with appropriate guidelines and checklists. The IFSS was used for uploading of data from the field in real time while fieldwork and data quality were simultaneously monitored by NMEP, NPC, and ICF. Weekly field check tables generated from the completed interviews sent to the central office were used to monitor fieldwork progress, and regular feedback was sent to the teams.

1.9 DATA PROCESSING

The processing of the 2021 NMIS data began immediately after the start of fieldwork. As data collection was being completed in each cluster, all electronic data files were transferred via the IFSS to the NPC central office in Abuja. Data files were registered and checked for inconsistencies, incompleteness, and outliers. The field teams were alerted on any inconsistencies and errors. Secondary editing, carried out in the central office, involved resolving inconsistencies and coding open-ended questions. The biomarker paper questionnaires were compared with electronic data files to check for any inconsistencies in data entry. Data entry and editing were carried out using the CSPro software package. Concurrent processing of the data offered a distinct advantage because it maximised the likelihood of the data being error-free and accurate. Timely generation of field check tables also allowed for effective monitoring. Secondary editing of the data was completed in February 2022. The data processing team coordinated this exercise at the central office.

Throughout this report, figures in tables reflect weighted numbers. Percentages based on 25 to 49 unweighted cases are shown in parentheses, and percentages based on fewer than 25 unweighted cases are suppressed and replaced with an asterisk. This is to caution readers when interpreting data that a percentage based on fewer than 50 cases may not be statistically reliable.

1.10 RESPONSE RATES

Table 1.1 shows response rates for the 2021 NMIS. A total of 14,185 households were selected for the survey, of which 13,887 were occupied and 13,727 were successfully interviewed, yielding a response rate of 99%. In the interviewed households, 14,647 women age 15–49 were identified for individual interviews. Interviews were completed with 14,476 women, yielding a response rate of 99%.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Nigeria MIS 2021

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	4,876	9,309	14,185
Households occupied	4,753	9,134	13,887
Households interviewed	4,690	9,037	13,727
Household response rate[1]	98.7	98.9	98.8
Interviews with women age 15–49			
Number of eligible women	4,993	9,654	14,647
Number of eligible women interviewed	4,930	9,546	14,476
Eligible women response rate[2]	98.7	98.9	98.8

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

HOUSING, HOUSEHOLD POPULATION, AND RESPONDENT CHARACTERISTICS 2

Key Findings

- ***Source of drinking water:*** 79% of households (95% urban and 71% rural) use an improved drinking water source.
- ***Type of sanitation facility:*** 64% of households (88% urban and 52% rural) use an improved sanitation facility. However, 19% of households rely on open defecation.
- ***Household composition:*** The average household size is 5.3 persons; 15% of households are female headed.
- ***Rooms for sleeping:*** 38% of households have three or more rooms for sleeping.
- ***Electricity:*** 49% of households have access to electricity (76% urban and 36% rural).
- ***Use of clean fuels and technologies for cooking****:* 27% of households use clean fuels for cooking.
- ***Literacy:*** 56% of women in Nigeria are literate.

Information on the socioeconomic characteristics of the household population in the 2021 NMIS provides a context for interpreting demographic and health indicators and gives an indication of the representativeness of the survey. The information also sheds light on the living conditions of the population.

This chapter presents information on sources of drinking water, type of sanitation facility, housing characteristics and household possessions, use of clean fuels and technologies related to cooking, wealth, and the composition of the household population. The chapter also presents information on characteristics of the survey respondents such as age, education, literacy, exposure to mass media, internet usage, and mobile phone ownership. These socioeconomic characteristics are useful for understanding the factors that affect use of health services and other health behaviours related to malaria control.

2.1 DRINKING WATER SOURCES

Improved sources of drinking water

Include piped water, public taps, standpipes, tube wells, boreholes, protected dug wells and springs, rainwater, water delivered via a tanker truck or a cart with a small tank, and bottled or sachet water.

Sample: Households and de jure population[1]

Improved sources of water protect against outside contamination so that water is more likely to be safe to drink. **Table 2.1** shows that 79% of households use an improved source of drinking water. The most common source of drinking water is tube wells or boreholes (34%), followed by protected dug wells (14%), unprotected dug wells (12%), and sachet water (11%). Six percent of households use surface water.

[1] Household, de jure, and de facto populations are defined in Section 2.7.

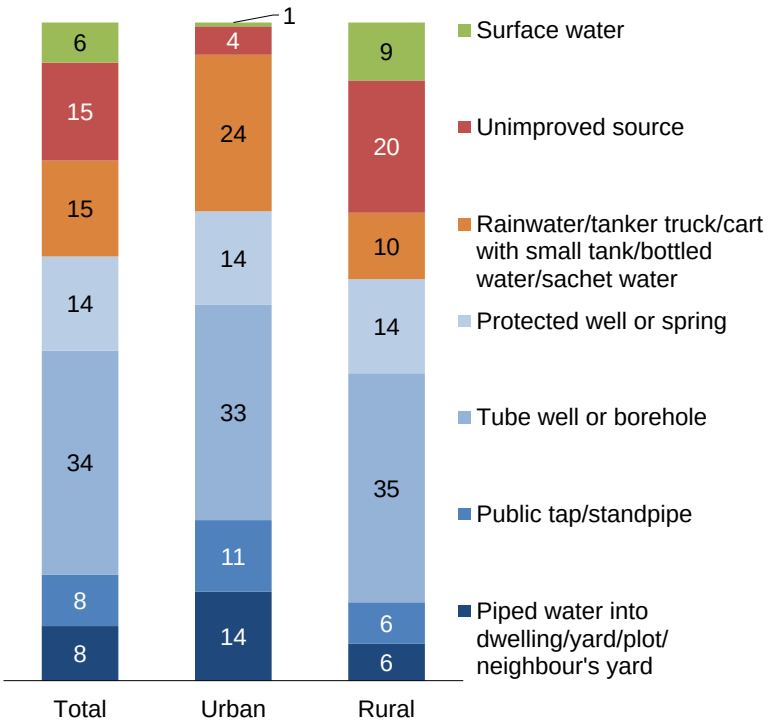
Forty-three percent of households have water on the premises, 51% take 30 minutes or less (round trip) to obtain drinking water, and 5% take more than 30 minutes.

Trends: Use of improved sources of drinking water has increased over the years, from 60% in 2008 to 74% in 2015 and 79% in 2021.

The percentage of households using improved sources of drinking water is higher in urban areas (95%) than in rural areas (71%), suggesting that urban and rural households rely on different sources of drinking water (**Figure 2.1**). About one-third of both urban households (33%) and rural households (35%) obtain water from a tube well or borehole; however, the second most common water source among urban households is sachet water (19%), whereas the second most common source among rural households is an unprotected dug well (16%).

Figure 2.1 **Household drinking water by residence**

Percent distribution of households by source of drinking water



2.2 DRINKING WATER SERVICE LADDER

Drinking water service ladder

Safely managed

Drinking water from an improved water source that is located on the premises, available when needed, and free from faecal and priority chemical contamination.

Basic

Drinking water from an improved source, provided either water is on the premises or round-trip collection time is 30 minutes or less.

Limited

Drinking water from an improved source, and round-trip collection time is more than 30 minutes.

Unimproved

Drinking water from an unprotected dug well or unprotected spring.

Surface water

Drinking water directly from a river, dam, lake, pond, stream, canal, or irrigation canal.

Sample: De jure population

Building off the classification of drinking water sources as improved and unimproved, the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) has devised a five-rung drinking water service ladder to benchmark and compare progress towards achieving Sustainable Development Goal (SDG) targets (UNICEF/WHO 2018). The 2021 NMIS captured information on four out of the five

rungs. Because the survey did not include testing of drinking water for faecal or chemical contamination, safely managed and basic drinking water services cannot be distinguished and are grouped together in **Table 2.2** as "at least basic service."

Overall, 72% of the household population has at least basic drinking water service, and 4% has limited service. The percentage of the population with at least basic drinking water service ranges from 64% in North East to 91% in South West. Ninety percent of urban residents have at least basic drinking water service, as compared with 65% of rural residents. Use of surface water decreases with increasing wealth, from 11% in the lowest wealth quintile to less than 1% in the highest quintile.

2.3 SANITATION

Improved toilet facilities

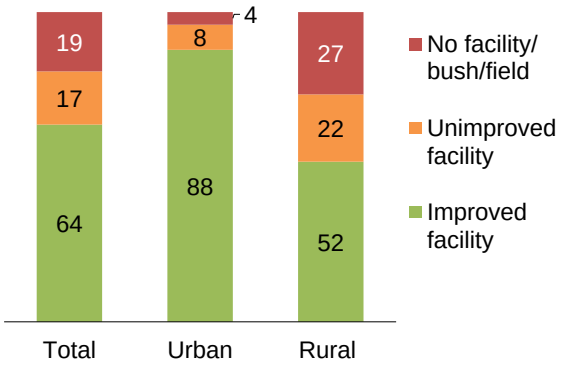
Flush/pour flush toilets that flush water and waste to a piped sewer system, septic tank, pit latrine, or unknown destination; ventilated improved pit (VIP) latrines; pit latrines with slabs; or composting toilets.

Sample: Households and de jure population

Nationally, 64% of households use improved toilet facilities, 17% use unimproved facilities, and 19% engage in open defecation (**Table 2.3** and **Figure 2.2**). A greater percentage of households in urban areas than rural areas use improved sanitation (88% versus 52%). The most commonly used improved toilet facilities in urban areas are flush/pour flush to septic tank facilities (38%), while in rural areas pit latrines with slabs (22%) are primarily used. Use of both unimproved sanitation facilities and open defecation is higher among rural households (22% and 27%, respectively) than urban households (8% and 4%, respectively). Among households with a toilet facility, 44% report that their facility is located inside their dwelling, while 52% report that the facility is located in their own yard/plot.

Figure 2.2 **Household sanitation facilities by residence**

Percent distribution of households by type of sanitation facilities



Trends: The percentage of households with improved sanitation facilities has fluctuated over time, decreasing from 53% in 2008 to 43% in 2010 before increasing to 56% in 2018 and 64% in 2021.

Sanitation service ladder

Safely managed

Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite.

Basic

Use of improved facilities that are not shared with other households.

Limited

Use of improved facilities shared by two or more households.

Unimproved

Use of pit latrines without a slab or platform, hanging latrines, or bucket latrines.

Open defecation

Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches, or other open spaces or with solid waste.

Sample: De jure population

The JMP has also devised a five-rung sanitation service ladder to benchmark and compare progress towards achieving SDG targets related to sanitation. The 2021 NMIS captured information about four of the five rungs but cannot distinguish between safely managed and basic sanitation services. For this reason, safely managed and basic sanitation services are grouped together in **Table 2.4** as "at least basic service."

Overall, 44% of the household population has at least basic service, and 16% has limited service. By zone, the percentage of the household population with at least basic service ranges from 33% in North East to 53% in South South (**Table 2.4**). The percentage of the population engaging in open defecation is highest in North Central (41%). As expected, use of unimproved sanitation facilities and open defecation decreases with increasing wealth.

2.4 HOUSING CHARACTERISTICS

The 2021 NMIS collected data on household features such as access to electricity, construction materials, number of rooms used for sleeping, and types of cooking technology and fuels. These data, along with information on ownership of household durable goods, source of drinking water, and sanitation, contribute to the creation of the household wealth index and provide information that may factor into other health indicators.

2.4.1 Construction Materials

Cement is the most common flooring material in Nigeria, used by 45% of households. A slightly higher percentage of urban households (49%) than rural households (43%) have cement floors. Earth/sand is the second most common flooring material, used by 37% of households, but unlike cement it is much more common in rural households than urban households (45% versus 21%) (**Table 2.5**). Most households in Nigeria (79%) have metal/zinc roofing, with little difference observed in urban and rural households (80% and 78%, respectively). The most common exterior wall material is cement (44%), followed by stone with mud (20%) and cement blocks (19%).

2.4.2 Rooms Used for Sleeping

The number of rooms a household uses for sleeping is an indicator of socioeconomic level and of crowding in the household, which can facilitate the spread of disease. Thirty-eight percent of households use three or more rooms for sleeping, 33% use two rooms, and 29% use only one room (**Table 2.5**).

2.5 Access to Electricity and Use of Clean Fuels and Technologies for Cooking

Forty-nine percent of households have access to electricity, including 76% of urban households and 36% of rural households (**Table 2.6**).

Primary reliance on clean fuels and technologies

The percentage of the population using clean fuels and technologies for cooking, where clean cooking fuels and technologies are defined as follows: stoves/cookers using electricity, LPG/natural gas/biogas, solar, and alcohol/ethanol.

Sample: Households and de jure population

WHO guidelines for indoor air quality (WHO 2014a) highlight the importance of addressing both fuel and technology for protecting public health. The guidelines identify and promote technologies and fuels that are efficient and recommend against the use of technologies that rely on solid fuels such as coal and wood as well as kerosene, a non-solid but highly polluting fuel. Only 27% of households use clean cooking fuels or technologies (48% in urban areas and 16% in rural areas). Twenty-two percent of households use LPG (liquefied petroleum gas) cooking stoves. Over half of households (62%) rely on three stone stoves/open fire for cooking.

The most common solid fuel used for cooking is wood (54% of households); 66% of rural households use wood, as compared with 30% of urban households.

2.6 Household Wealth

2.6.1 Household Durable Goods

The 2021 NMIS collected information on possession of household goods and means of transportation, ownership of agricultural land, and ownership of farm animals (**Table 2.7**). Eighty-two percent of households own a mobile phone. Possession of a mobile phone is more common in urban households (89%) than rural households (79%). Approximately 4 in 10 households have a radio (44%), and 42% of households have a television. Twenty-three percent of households have a refrigerator, and 8% have a computer. Thirteen percent of households own a bicycle, 29% own a motorcycle or scooter, and 11% own a car or truck. Overall, 55% of households own agricultural land and 45% own farm animals. As expected, more households in rural areas than urban areas own agricultural land (66% and 32%, respectively) and farm animals (54% and 26%, respectively).

2.6.2 Wealth Index

Wealth index

Households are given scores based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as source of drinking water, toilet facilities, and flooring materials. These scores are derived using principal component analysis. National wealth quintiles are compiled by assigning the household score to each usual (de jure) household member, ranking each person in the household population by her or his score, and then dividing the distribution into five equal categories, each comprising 20% of the population.

Sample: Households

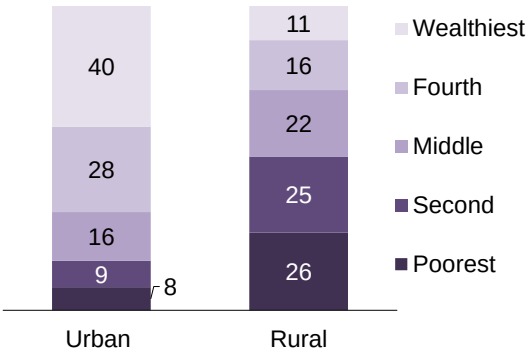
The distribution of the household population by wealth quintile indicates the degree to which wealth is evenly distributed among the population**. Table 2.8** shows the distribution of the de jure household population by wealth quintile, according to residence, zone, and state. Most of the urban population falls in

the upper two wealth quintiles, while most of the rural population falls in the bottom two quintiles (**Figure 2.3**). Forty percent of urban residents are in the highest wealth quintile, while 8% are in the lowest wealth quintile. In contrast, 11% of rural residents are in the highest wealth quintile and 26% are in the lowest quintile.

The concentration of wealth differs markedly by zone. The percentages of the population in the lowest wealth quintile are greatest in North East and North West (38% and 31%, respectively). South West has the greatest percentage of residents in the highest wealth quintile (57%). By state, Lagos has the highest percentage (78%) of residents in the highest wealth quintile, while Borno has the highest percentage of residents in the lowest wealth quintile (67%).

Figure 2.3 **Household wealth by residence**

Percent distribution of de jure population by wealth quintiles



2.7 HOUSEHOLD POPULATION AND COMPOSITION

Household

A person or group of related or unrelated persons who live together in the same dwelling unit(s), who acknowledge one adult male or female as the head of the household, who share the same housekeeping arrangements, and who are considered a single unit.

De facto population

All persons who stayed in the selected households the night before the interview (whether usual residents or visitors).

De jure population

All persons who are usual residents of the selected households, whether or not they stayed in the household the night before the interview.

How data are calculated: All tables are based on the de facto population, unless otherwise specified.

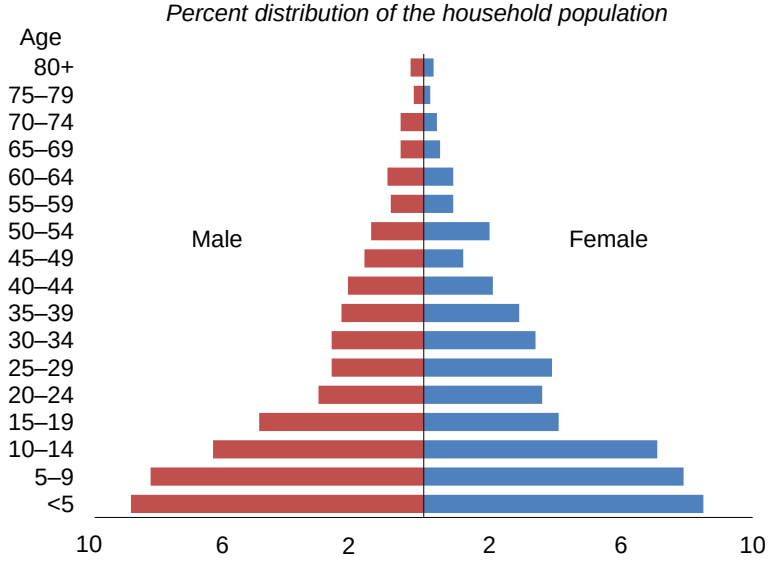
Table 2.9 shows the distribution of the de facto household population in the 2021 NMIS by 5-year age groups, according to sex and residence. A total of 72,258 people stayed overnight in the 13,727 households interviewed in the survey. Nationally, 51% of the population falls into dependency age groups (0–14 and 65 or above). Overall, 53% of household residents are age 0–17, and 23% are classified as adolescents (age 10–19). Differences by urban and rural residence are generally small.

The population pyramid in **Figure 2.4** shows the population distribution by sex and 5-year age groups. The broad base of the pyramid indicates that Nigeria's population is young, with 47% of the population under age 15.

Table 2.10 presents the distribution of households by sex of head of household, household size, and mean size of households, according to residence. Nationally, 85% of households are headed by men and 15% are headed by women. Urban households are slightly more likely than rural households to be headed by women (18% versus 14%). On average, households consist of 5.3 persons; rural households are slightly larger than urban households (5.5 persons versus 5.0 persons).

***Figure 2.4* Population pyramid**

Percent distribution of the household population



2.8 Basic Characteristics of Survey Respondents

A total of 14,476 women age 15–49 were interviewed with the Woman's Questionnaire; their background characteristics are presented in **Table 2.11.1**, and their distribution by state is presented in **Table 2.11.2**. Of note, 19% of respondents were age 15–19 and over half (55%) were under age 30. Fifty-nine percent of respondents practice Islam, 7% are Catholic, and 34% fall in the other Christian category. Close to 7 out of 10 women (68%) live in rural areas.

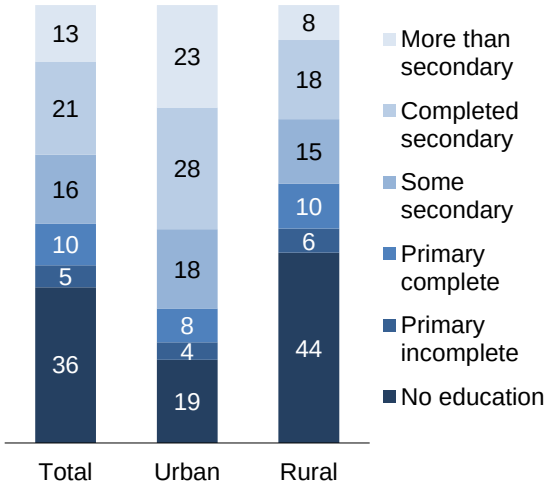
2.9 Educational Attainment

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 use of health care services for herself, her children, and her family.

Table 2.12.1 shows the percent distribution of women age 15–49 by highest formal level of schooling attended or completed, and median years completed, according to background characteristics. Overall, 36% of women have no formal education, 5% have some primary education, 10% completed primary education but have not gone further, 16% have some secondary education, and 21% have completed secondary education. An additional 13% have attended or completed more than secondary education (**Figure 2.5**). Nationally, women have completed a median of 6.0 years of education. Formal educational attainment by state is shown in **Table 2.12.2**.

***Figure 2.5* Education of survey respondents by residence**

Percent distribution of women age 15–49 by highest level of schooling attended or completed



Note: No education includes informal education (adult education, Tsangaya, or Quranic).

In **Tables 2.12.1** and **2.12.2**, respondents who did not attend formal schooling are categorised as having no education. However, some of these respondents attended an informal or religious educational programme such as adult education, Tsangaya, or Quranic. Among women with informal schooling, 76% attended a Quranic school, and 22% attended a Tsangaya school; only 1% attended an adult education programme (**Tables 2.13.1** and **2.13.2**).

Patterns by background characteristics

- The median number of years of education completed generally falls with increasing age, from 8.7 years among women age 15–19 to 4.9 years among women age 45–49.
- By residence, the percentage of women with a secondary education or higher is greater in urban areas than rural areas (51% versus 26%). The median number of years of education completed is 11.0 among urban women and 5.1 among rural women.
- The percentage of women with no formal education ranges from 3% in South East to 58% in North East.
- The percentage of women with a secondary education or higher ranges from 18% in North West to 59% in South South.
- The percentage of women with no formal education varies widely by state, from 1% each in Imo and Anambra to 79% in Kebbi (**Table 2.12.2**).

2.10 LITERACY

Literacy

Respondents who had attended higher than secondary school were assumed to be literate. All other respondents were considered literate if they could read aloud all or part of a sentence shown to them.

Sample: Women age 15–49

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. The 2021 NMIS 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 2.14.1 shows that, overall, 56% of women in Nigeria are literate. Forty-four percent of women cannot read at all.

Patterns by background characteristics

- Literacy is highest in the 15–19 age group (66%) and generally decreases with increasing age.
- Literacy varies by place of residence; 75% of women in urban areas are literate, as compared with 47% of women in rural areas.
- By zone, the percentage of respondents who are literate ranges from 37% in North West to 89% in South East.
- By state, literacy among respondents ranges from 22% in Sokoto to 97% in Anambra (**Table 2.14.2**).

2.11 MASS MEDIA EXPOSURE

Exposure to mass media

Respondents were asked how often they read a newspaper, listened to the radio, or watched television. Those who responded *at least once a week* are considered regularly exposed to that form of media.

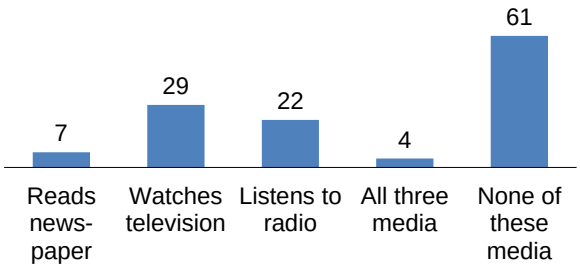
Sample: Women age 15–49

Mass media (e.g., television, newspapers, magazines, and radio) is a means of communication capable of reaching large numbers of people in a short time. Exposure to mass media is key to information dissemination and knowledge expansion. All women were asked how often they listen to a radio or watch television, and women who were literate were asked how often they read a newspaper or magazine.

Seven percent of women read a newspaper at least once a week, 29% watch television at least once a week, and 22% listen to the radio at least once a week (**Table 2.15** and **Figure 2.6**). Four percent of women are exposed to all three media sources at least once a week; 61% access none of the three media sources at least once a week.

Figure 2.6 **Exposure to mass media**

Percentage of women age 15–49 who are exposed to media on a weekly basis



Patterns by background characteristics

- Women in rural areas are more likely than women in urban areas to access none of the three media sources weekly (69% versus 44%).
- The percentage of women accessing none of the three media sources at least once a week ranges from 38% in South East to 84% in North East.
- The percentage of women who access all three media sources increases with increasing wealth, from less than 1% among women in the lowest two wealth quintiles to 12% among women in the highest quintile.

2.12 MOBILE PHONE OWNERSHIP AND INTERNET USAGE

Use of the internet

Respondents were asked if they have ever used the internet from any device, if they used the internet in the last 12 months, and, if so, how often they used it during the last month.

Sample: Women age 15–49

The internet has become an important means of sharing information and transacting business. It has increasingly connected citizens both economically and socially and is one of the defining factors in our information dissemination capability. One of the critical ways in which the internet is accessed is via smart phones. To this end, the 2021 NMIS asked respondents about smart phone ownership and use of the internet from any device.

More than half of women (58%) own a mobile phone, and 23% own a smart phone. Only one in four women (25%) have ever used the internet, with 23% using the internet in the last 12 months (**Table 2.16**). Among women who have used the internet in the past 12 months, 65% use it almost every day.

Patterns by background characteristics

- By age, mobile phone ownership ranges from 40% among women age 15–19 to 67% among women age 35–39.
- Thirty-nine percent of urban women have used the internet in the last 12 months, as compared with 15% of rural women.
- By zone, the percentage of women who use the internet almost every day ranges from 51% in North West to 74% in North Central.

List of Tables

For detailed information on household population, housing characteristics, and respondent characteristics, see the following tables:

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- **Table 2.2 Drinking water service ladder**
- **Table 2.3 Household sanitation facilities**
- **Table 2.4 Sanitation service ladder**
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- **Table 2.7 Household possessions**
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- **Table 2.11.1 Background characteristics of respondents: National**
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Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water and by time to obtain drinking water, according to residence, Nigeria MIS 2021

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	95.1	71.0	79.0	94.1	68.2	76.2
Piped into dwelling/yard/plot	11.6	4.5	6.9	11.2	3.7	6.0
Piped to neighbour	1.9	1.1	1.4	1.8	1.0	1.3
Public tap/standpipe	10.9	6.3	7.8	12.7	6.8	8.6
Tube well or borehole	32.7	34.8	34.1	34.4	35.0	34.8
Protected dug well	13.9	13.6	13.7	14.8	14.0	14.3
Protected spring	0.3	0.7	0.6	0.3	0.7	0.6
Rainwater	1.7	2.4	2.1	1.4	1.9	1.8
Tanker truck/cart with small tank	1.1	0.5	0.7	1.4	0.4	0.7
Bottled water	2.2	0.4	1.0	1.5	0.2	0.6
Sachet water	18.8	6.8	10.8	14.7	4.5	7.6
Unimproved source	4.3	20.1	14.9	5.3	23.4	17.8
Unprotected dug well	3.9	15.8	11.8	4.9	19.0	14.6
Unprotected spring	0.2	4.3	2.9	0.3	4.3	3.1
Other	0.2	0.1	0.1	0.2	0.1	0.1
Surface water	0.6	8.8	6.1	0.6	8.4	6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises[1]	56.3	36.4	43.0	52.8	35.4	40.7
30 minutes or less	39.8	57.1	51.4	42.4	57.8	53.0
More than 30 minutes	3.5	5.5	4.8	4.4	6.0	5.5
Don't know	0.5	0.9	0.8	0.4	0.9	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population	4,546	9,181	13,727	22,518	50,626	73,143

[1] Includes water piped to a neighbour and those reporting a round-trip collection time of zero minutes

Table 2.2 Drinking water service ladder

Percent distribution of de jure population by drinking water service ladder, according to background characteristics, Nigeria MIS 2021

Background characteristic	At least basic service[1]	Limited service[2]	Unimproved[3]	Surface water	Total	Number of persons
Residence						
Urban	89.5	4.6	5.3	0.6	100.0	22,518
Rural	64.6	3.7	23.4	8.4	100.0	50,626
Zone						
North Central	63.5	7.6	15.6	13.3	100.0	12,000
North East	65.2	6.1	18.8	9.9	100.0	12,741
North West	65.8	2.3	30.5	1.3	100.0	24,973
South East	85.5	5.5	3.3	5.7	100.0	5,625
South South	84.2	1.2	5.9	8.7	100.0	8,293
South West	91.3	2.2	5.1	1.4	100.0	9,512
Wealth quintile						
Lowest	41.9	3.6	43.8	10.7	100.0	14,637
Second	62.0	4.3	25.6	8.1	100.0	14,622
Middle	72.1	6.3	14.3	7.3	100.0	14,641
Fourth	88.3	3.6	4.6	3.5	100.0	14,614
Highest	96.9	1.9	0.9	0.3	100.0	14,629
Total	72.2	3.9	17.8	6.0	100.0	73,143

Note: Service ladder concept and definitions are based on the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP).
[1] Defined as drinking water from an improved source, provided either water is on the premises or round-trip collection time is 30 minutes or less. Includes safely managed drinking water, which is not shown separately.
[2] Drinking water from an improved source, provided round-trip collection time is more than 30 minutes or is unknown.
[3] Drinking water from an unprotected dug well, unprotected spring, or other unimproved source

Table 2.3 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities and percent distribution of households and de jure population with a toilet/latrine facility by location of the facility, according to residence, Nigeria MIS 2021

Type and location of toilet/latrine facility	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Improved sanitation facility	87.9	51.7	63.7	87.0	48.7	60.5
Flush/pour flush to piped sewer system	12.2	5.5	7.7	10.6	4.5	6.4
Flush/pour flush to septic tank	38.2	15.5	23.0	33.0	12.2	18.6
Flush/pour flush to pit latrine	11.8	6.9	8.5	11.7	6.3	8.0
Ventilated improved pit (VIP) latrine	5.4	2.0	3.1	6.8	2.3	3.7
Pit latrine with slab	20.2	21.5	21.1	24.7	23.1	23.6
Composting toilet	0.0	0.3	0.2	0.0	0.4	0.3
Unimproved sanitation facility	8.0	21.6	17.1	9.5	25.2	20.4
Flush/pour flush not to sewer/septic tank/pit latrine	0.4	0.2	0.3	0.3	0.2	0.2
Pit latrine without slab/open pit	6.4	20.1	15.6	8.0	23.9	19.0
Bucket	0.6	0.2	0.3	0.5	0.1	0.2
Hanging toilet/hanging latrine	0.6	0.8	0.7	0.6	0.8	0.7
Other	0.1	0.2	0.2	0.1	0.1	0.1
Open defecation (no facility/ bush/field)	4.1	26.6	19.2	3.5	26.1	19.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population	4,546	9,181	13,727	22,518	50,626	73,143
Location of toilet facility						
In own dwelling	51.8	38.5	43.7	50.5	37.4	42.2
In own yard/plot	43.6	56.6	51.5	45.0	58.6	53.6
Elsewhere	4.6	4.9	4.8	4.5	4.0	4.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population with a toilet/latrine facility	4,361	6,736	11,096	21,721	37,417	59,138

Table 2.4 Sanitation service ladder

Percent distribution of de jure population by type of sanitation service, according to background characteristics, Nigeria MIS 2021

Background characteristic	At least basic service[1]	Limited service[2]	Unimproved[3]	Open defecation	Total	Number of persons
Residence						
Urban	59.7	27.3	9.5	3.5	100.0	22,518
Rural	37.3	11.4	25.2	26.1	100.0	50,626
Zone						
North Central	35.8	15.1	8.5	40.6	100.0	12,000
North East	33.3	12.7	34.9	19.1	100.0	12,741
North West	49.4	10.4	29.6	10.6	100.0	24,973
South East	44.5	17.6	10.1	27.9	100.0	5,625
South South	52.7	20.6	12.4	14.2	100.0	8,293
South West	48.4	33.4	4.6	13.6	100.0	9,512
Wealth quintile						
Lowest	15.6	11.0	39.0	34.4	100.0	14,637
Second	31.7	9.9	33.1	25.3	100.0	14,622
Middle	40.8	15.6	19.9	23.7	100.0	14,641
Fourth	53.4	26.5	8.9	11.2	100.0	14,614
Highest	79.6	18.4	0.9	1.1	100.0	14,629
Total	44.2	16.3	20.4	19.1	100.0	73,143

Note: Service ladder concept and definitions are based on the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP).
[1] Defined as use of improved facilities that are not shared with other households. Includes safely managed sanitation service, which is not shown separately.
[2] Defined as use of improved facilities shared by 2 or more households
[3] Use of flush/pour flush toilet not to sewer, septic tank, or pit latrine; pit latrine without a slab/open pit; hanging toilet/latrine; or bucket

Table 2.5 Household characteristics: Construction materials and rooms used for sleeping

Percent distribution of households and de jure population by housing construction materials and rooms used for sleeping, according to residence, Nigeria MIS 2021

Housing characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Flooring material						
Earth/sand	20.6	45.2	37.0	25.6	50.9	43.1
Dung	0.2	0.2	0.2	0.2	0.3	0.2
Wood/planks	0.4	0.5	0.5	0.5	0.5	0.5
Palm/bamboo	0.0	0.2	0.2	0.0	0.3	0.2
Parquet or polished wood	0.6	0.3	0.4	0.5	0.3	0.4
Vinyl or asphalt strips	0.2	0.1	0.1	0.1	0.1	0.1
Ceramic tiles	23.9	8.7	13.8	21.1	7.3	11.5
Cement	48.8	43.2	45.0	47.7	39.2	41.8
Carpet	4.9	1.6	2.7	4.0	1.1	2.0
Other	0.3	0.1	0.1	0.3	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Roof material						
No roof	0.3	0.2	0.2	0.2	0.2	0.2
Thatch/palm leaf	0.8	5.6	4.0	0.9	5.4	4.0
Grass	1.2	4.5	3.4	1.3	4.6	3.6
Rustic mat	1.0	0.7	0.8	1.4	0.8	1.0
Palm/bamboo	1.0	5.0	3.7	1.4	6.5	4.9
Wood planks	0.4	1.1	0.8	0.6	1.1	1.0
Cardboard	0.1	0.2	0.2	0.1	0.2	0.1
Metal/zinc	80.3	77.7	78.6	81.5	77.6	78.8
Wood	0.4	0.6	0.5	0.4	0.5	0.4
Calamine/cement fibre	0.5	0.1	0.2	0.4	0.1	0.2
Ceramic tiles	0.9	0.4	0.6	0.8	0.3	0.4
Cement	1.8	1.2	1.4	1.9	0.8	1.1
Roofing shingles	3.0	0.9	1.6	2.4	0.7	1.2
Asbestos	6.5	1.6	3.2	5.1	1.0	2.3
Other	1.7	0.3	0.8	1.9	0.3	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Exterior wall material						
No walls	1.8	3.1	2.6	2.1	3.4	3.0
Cane/palm/trunks	0.5	3.1	2.3	0.6	3.1	2.3
Dirt	1.3	2.8	2.3	1.5	3.1	2.6
Bamboo with mud	1.0	6.1	4.4	1.2	7.4	5.5
Stone with mud	7.6	26.1	20.0	9.9	30.4	24.1
Uncovered adobe	0.1	0.5	0.4	0.3	0.5	0.5
Plywood	0.2	0.3	0.3	0.2	0.3	0.3
Cardboard	0.0	0.1	0.1	0.0	0.1	0.0
Reused wood	0.3	0.1	0.2	0.3	0.1	0.2
Cement	59.8	36.2	44.1	55.1	32.0	39.1
Stone with lime/cement	1.3	1.6	1.5	1.6	1.6	1.6
Bricks	0.9	2.1	1.7	0.9	2.3	1.9
Cement blocks	22.0	16.8	18.5	22.4	14.7	17.1
Covered adobe	0.3	0.1	0.2	0.6	0.2	0.3
Wood planks/shingles	0.4	0.4	0.4	0.5	0.4	0.4
Other	2.4	0.5	1.1	2.9	0.4	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	32.4	27.6	29.2	21.7	16.0	17.8
Two	33.9	32.7	33.1	32.9	29.2	30.4
Three or more	33.7	39.7	37.7	45.3	54.7	51.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/ population	4,546	9,181	13,727	22,518	50,626	73,143

Table 2.6 Household characteristics: Electricity, cooking technology, and cooking fuel

Percent distribution of households and de jure population by access to electricity and cooking fuels and technologies, according to residence, Nigeria MIS 2021

	Households			Population		
Housing characteristic	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	75.6	35.6	48.9	72.1	31.3	43.8
No	24.4	64.4	51.1	27.9	68.7	56.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main cooking technology						
Clean fuels and technologies	48.0	16.0	26.6	39.0	11.2	19.8
Electric stove	1.9	0.9	1.3	1.7	0.8	1.1
Solar cooker	0.1	0.0	0.1	0.1	0.0	0.1
LPG/cooking gas stove	38.8	13.8	22.1	31.1	9.4	16.1
Piped natural gas stove	3.0	0.7	1.5	2.4	0.5	1.1
Biogas stove	4.2	0.5	1.7	3.7	0.5	1.5
Other fuels and technologies	50.9	82.9	72.3	60.7	88.5	79.9
Kerosene stove/liquid fuel stove not using alcohol/ethanol	9.0	5.8	6.9	7.2	3.8	4.8
Manufactured solid fuel stove	1.3	1.0	1.1	1.5	0.9	1.1
Traditional solid fuel stove	2.7	2.1	2.3	4.0	2.1	2.7
Three stone stove/open fire	37.0	73.8	61.6	46.9	81.6	70.9
Other fuel	0.9	0.1	0.4	1.1	0.1	0.4
No food cooked in household	1.1	1.1	1.1	0.3	0.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Clean fuels and technologies[1]	48.0	16.0	26.6	39.0	11.2	19.8
Solid fuels for cooking	41.3	76.3	64.7	52.9	84.0	74.4
Coal/lignite	0.4	0.1	0.2	0.5	0.1	0.2
Charcoal	8.7	3.3	5.0	10.0	2.9	5.1
Wood	30.1	66.2	54.2	39.3	73.2	62.8
Straw/shrubs/grass	1.2	4.9	3.7	1.5	5.8	4.4
Agricultural crop	0.4	0.9	0.7	0.8	0.9	0.9
Animal dung/waste	0.3	0.4	0.4	0.5	0.5	0.5
Processed biomass (pellets) or woodchips	0.1	0.5	0.4	0.1	0.5	0.4
Garbage/plastic	0.1	0.1	0.1	0.1	0.1	0.1
Sawdust	0.1	0.0	0.1	0.1	0.1	0.1
Other fuels	9.6	6.5	7.6	7.8	4.4	5.5
Gasoline/diesel	0.1	0.1	0.1	0.1	0.1	0.1
Kerosene	9.4	6.4	7.4	7.6	4.4	5.4
Other fuel	0.1	0.0	0.0	0.1	0.0	0.0
No food cooked in household	1.1	1.1	1.1	0.3	0.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population	4,546	9,181	13,727	22,518	50,626	73,143

LPG = Liquefied petroleum gas

[1] Includes stoves/cookers using electricity, LPG/natural gas/biogas, solar, and alcohol/ethanol

Table 2.7 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land, and livestock/farm animals, by residence, Nigeria MIS 2021

	Residence		
Possession	Urban	Rural	Total
Household effects			
Radio	50.3	40.4	43.7
Television	62.4	31.1	41.5
Mobile phone	88.8	79.1	82.3
Non-mobile telephone	2.9	1.1	1.7
Computer	15.6	4.4	8.1
Refrigerator	39.0	15.5	23.3
Table	69.1	51.8	57.5
Chair	83.9	82.0	82.6
Bed	90.4	90.9	90.7
Sofa	50.1	36.9	41.3
Cupboard	61.0	48.5	52.7
Air conditioner	8.4	2.5	4.5
Electric iron	51.0	20.5	30.6
Generator	35.9	20.4	25.5
Fan	68.9	35.0	46.3
Means of transport			
Bicycle	10.3	14.7	13.3
Animal-drawn cart	1.5	4.4	3.5
Motorcycle/scooter	20.8	32.6	28.7
Car/truck	18.6	7.2	11.0
Boat with a motor/canoe	1.7	2.1	1.9
Keke napep	1.7	1.4	1.5
Ownership of agricultural land	31.7	66.4	54.9
Ownership of farm animals[1]	26.2	54.4	45.1
Number	4,546	9,181	13,727

[1] Cows, bulls, other cattle, horses, donkeys, goats, sheep, chickens or other poultry, pigs, or camels

Table 2.8 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini coefficient, according to residence, zone, and state, Nigeria MIS 2021

Residence/zone/state	Wealth quintile					Total	Number of persons	Gini coefficient[1]
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	7.6	8.7	16.0	28.0	39.7	100.0	22,518	0.30
Rural	25.5	25.0	21.8	16.4	11.2	100.0	50,626	0.40
Zone								
North Central	12.9	20.8	27.2	22.8	16.3	100.0	12,000	0.34
North East	37.9	29.1	16.6	10.4	6.1	100.0	12,741	0.38
North West	30.6	28.3	19.9	15.0	6.3	100.0	24,973	0.37
South East	2.4	7.4	25.3	31.9	33.0	100.0	5,625	0.26
South South	2.6	7.8	22.5	30.0	37.1	100.0	8,293	0.24
South West	3.0	3.0	10.6	26.6	56.8	100.0	9,512	0.15
State								
Sokoto	20.5	31.3	21.5	18.1	8.7	100.0	2,426	0.37
Zamfara	29.1	33.7	15.4	12.3	9.5	100.0	1,421	0.42
Katsina	45.3	25.6	14.1	11.5	3.5	100.0	7,037	0.42
Jigawa	37.2	27.9	11.8	13.1	10.0	100.0	2,726	0.46
Yobe	41.3	27.5	14.7	5.0	11.6	100.0	2,261	0.44
Borno	66.5	15.8	15.7	1.2	0.9	100.0	1,971	0.42
Adamawa	27.0	22.3	23.9	18.2	8.5	100.0	1,788	0.33
Gombe	27.4	23.7	19.0	20.6	9.2	100.0	1,581	0.34
Bauchi	35.8	44.0	12.6	5.5	2.0	100.0	3,789	0.33
Kano	19.8	33.2	24.4	18.2	4.4	100.0	4,892	0.32
Kaduna	6.9	20.7	32.1	26.4	13.9	100.0	3,302	0.31
Kebbi	41.7	30.3	20.7	6.6	0.8	100.0	3,169	0.32
Niger	20.9	35.5	28.1	10.5	5.0	100.0	3,212	0.29
FCT	0.7	5.9	20.1	18.1	55.2	100.0	968	0.35
Nasarawa	16.1	19.7	27.3	24.9	11.9	100.0	1,829	0.40
Plateau	16.6	22.5	35.6	17.1	8.3	100.0	1,518	0.29
Taraba	23.1	24.4	19.7	23.9	8.9	100.0	1,351	0.41
Benue	10.9	22.3	32.2	23.6	11.0	100.0	1,887	0.34
Kogi	2.1	7.9	31.1	41.5	17.3	100.0	1,307	0.28
Kwara	7.1	5.7	9.2	40.6	37.4	100.0	1,280	0.26
Oyo	8.2	5.7	6.9	20.5	58.7	100.0	2,398	0.18
Osun	1.0	1.5	12.8	31.0	53.6	100.0	1,456	0.17
Ekiti	0.6	3.9	21.9	38.1	35.5	100.0	572	0.26
Ondo	0.4	4.4	24.7	40.4	30.0	100.0	746	0.31
Edo	3.1	6.5	11.9	28.6	49.9	100.0	1,279	0.23
Anambra	0.0	0.4	2.6	24.1	72.9	100.0	1,305	0.17
Enugu	0.8	12.3	30.0	36.1	20.8	100.0	1,011	0.29
Ebonyi	7.4	16.2	41.4	26.9	8.0	100.0	1,563	0.31
Cross River	2.3	10.7	28.0	27.4	31.6	100.0	1,117	0.30
Akwa Ibom	4.1	11.7	35.8	33.7	14.8	100.0	2,398	0.28
Abia	0.0	1.0	20.2	32.4	46.4	100.0	831	0.22
Imo	1.0	2.7	29.8	46.5	20.0	100.0	915	0.27
Rivers	1.7	3.7	7.4	24.1	63.0	100.0	1,459	0.16
Bayelsa	1.1	5.6	28.1	31.6	33.5	100.0	592	0.29
Delta	1.3	5.4	18.6	32.3	42.4	100.0	1,447	0.26
Lagos	0.0	0.1	2.5	19.6	77.8	100.0	2,946	0.09
Ogun	4.6	5.1	19.4	35.1	35.8	100.0	1,393	0.25
Total	20.0	20.0	20.0	20.0	20.0	100.0	73,143	0.39

[1] The Gini coefficient indicates the level of concentration of wealth, with 0 representing an equal wealth distribution and 1 representing a totally unequal distribution.

Table 2.9 Household population by age, sex, and residence

Percent distribution of the de facto household population by various age groups and percentage of the de facto household population age 10–19, according to sex and residence, Nigeria MIS 2021

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	16.1	15.3	15.7	18.5	17.7	18.1	17.8	17.0	17.4
5–9	14.9	15.5	15.2	17.2	16.1	16.6	16.5	15.9	16.2
10–14	13.0	14.3	13.6	12.7	14.1	13.4	12.8	14.1	13.5
15–19	10.5	8.5	9.5	9.8	8.1	8.9	10.0	8.2	9.1
20–24	6.8	6.7	6.8	6.2	7.4	6.8	6.4	7.2	6.8
25–29	5.7	7.9	6.8	5.5	7.7	6.6	5.6	7.8	6.7
30–34	5.5	7.2	6.3	5.5	6.8	6.1	5.5	6.9	6.2
35–39	5.7	6.6	6.1	4.8	5.3	5.1	5.1	5.7	5.4
40–44	5.1	4.7	4.9	4.4	3.9	4.2	4.7	4.1	4.4
45–49	4.2	2.9	3.5	3.3	2.1	2.7	3.6	2.4	3.0
50–54	3.6	4.0	3.8	3.2	4.0	3.6	3.3	4.0	3.7
55–59	2.3	1.9	2.1	2.0	1.8	1.9	2.1	1.8	2.0
60–64	2.3	1.6	2.0	2.0	1.7	1.9	2.1	1.7	1.9
65–69	1.4	0.9	1.2	1.4	1.0	1.2	1.4	1.0	1.2
70–74	1.1	0.7	0.9	1.5	0.8	1.1	1.4	0.7	1.0
75–79	0.4	0.5	0.4	0.6	0.5	0.6	0.6	0.5	0.5
80+	0.6	0.5	0.6	0.8	0.7	0.7	0.7	0.6	0.7
Don't know	0.7	0.2	0.4	0.4	0.3	0.4	0.5	0.3	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dependency age groups									
0–14	44.0	45.1	44.6	48.5	47.9	48.2	47.1	47.0	47.1
15–64	51.7	52.1	51.9	46.8	48.9	47.9	48.3	49.9	49.1
65+	3.6	2.6	3.1	4.3	2.9	3.6	4.1	2.8	3.4
Don't know	0.7	0.2	0.4	0.4	0.3	0.4	0.5	0.3	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Child and adult populations									
0–17	50.5	50.5	50.5	55.3	52.9	54.1	53.8	52.2	53.0
18+	48.8	49.3	49.0	44.2	46.8	45.5	45.7	47.6	46.6
Don't know	0.7	0.2	0.4	0.4	0.3	0.4	0.5	0.3	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Adolescents 10–19	23.4	22.8	23.1	22.5	22.2	22.3	22.8	22.3	22.6
Number of persons	11,204	11,011	22,215	24,954	25,088	50,042	36,159	36,099	72,258

Table 2.10 Household composition

Percent distribution of households by sex of head of household and by household size, and mean size of households, according to residence, Nigeria MIS 2021

	Residence		
Characteristic	Urban	Rural	Total
Household headship			
Male	82.5	86.3	85.1
Female	17.5	13.7	14.9
Total	100.0	100.0	100.0
Number of usual members			
1	11.1	8.9	9.6
2	9.8	11.1	10.6
3	13.1	12.4	12.6
4	16.1	13.6	14.4
5	14.9	13.0	13.6
6	11.5	11.4	11.5
7	8.1	8.1	8.1
8	4.8	5.7	5.4
9+	10.5	15.9	14.1
Total	100.0	100.0	100.0
Mean size of households	5.0	5.5	5.3
Number of households	4,546	9,181	13,727

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

Table 2.11.1 Background characteristics of respondents: National

Percent distribution of women age 15–49 by selected background characteristics, Nigeria MIS 2021

Background characteristic	Weighted percent	Weighted number	Unweighted number
Age			
15–19	19.3	2,793	2,663
20–24	17.0	2,464	2,466
25–29	18.4	2,660	2,687
30–34	16.3	2,362	2,340
35–39	13.6	1,964	1,998
40–44	9.8	1,420	1,435
45–49	5.6	814	887
Religion			
Catholic	7.3	1,057	1,301
Other Christian	33.8	4,892	5,757
Islam	58.5	8,470	7,344
Traditionalist	0.4	54	70
Other	0.0	3	4
Residence			
Urban	32.1	4,641	4,930
Rural	67.9	9,835	9,546
Zone			
North Central	16.4	2,377	2,674
North East	16.6	2,399	2,523
North West	33.4	4,832	3,635
South East	7.7	1,111	1,523
South South	12.0	1,734	2,148
South West	14.0	2,023	1,973
Education			
No education[1]	35.6	5,156	4,792
Primary	14.4	2,089	1,977
Secondary	37.1	5,364	5,669
More than secondary	12.9	1,867	2,038
Wealth quintile			
Lowest	18.3	2,651	2,434
Second	18.9	2,730	2,431
Middle	19.3	2,799	2,802
Fourth	20.8	3,006	3,225
Highest	22.7	3,289	3,584
Total	100.0	14,476	14,476

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 2.11.2 Distribution of respondents: States

Percent distribution of women age 15–49 by state, Nigeria MIS 2021

State	Weighted percent	Weighted number	Unweighted number
North Central			
FCT-Abuja	1.6	238	359
Benue	2.9	418	463
Kogi	1.7	251	329
Kwara	1.9	277	313
Nasarawa	2.5	358	420
Niger	3.7	537	423
Plateau	2.1	298	367
North East			
Adamawa	2.3	336	387
Bauchi	4.9	703	484
Borno	2.5	358	420
Gombe	1.9	279	365
Taraba	1.9	276	403
Yobe	3.1	447	464
North West			
Jigawa	3.9	566	506
Kaduna	4.8	690	531
Kano	6.4	920	620
Katsina	9.4	1,362	662
Kebbi	4.2	613	479
Sokoto	2.8	399	398
Zamfara	1.9	282	439
South East			
Abia	1.2	178	299
Anambra	2.0	283	357
Ebonyi	2.1	297	312
Enugu	1.4	204	289
Imo	1.0	149	266
South South			
Akwa Ibom	3.3	478	320
Bayelsa	0.9	131	314
Cross River	1.5	224	318
Delta	2.1	298	326
Edo	2.1	300	331
Rivers	2.1	304	539
South West			
Ekiti	0.8	123	278
Lagos	4.3	620	346
Ogun	2.1	308	330
Ondo	1.1	156	306
Osun	2.2	320	354
Oyo	3.4	497	359
Total	100.0	14,476	14,476

Table 2.12.1 Formal 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 MIS 2021

Background characteristic	Highest level of schooling						Total	Median years completed	Number of women
	No education[1]	Some primary	Completed primary[2]	Some secondary	Completed secondary[3]	More than secondary			
Age									
15–24	29.8	4.5	8.0	25.0	25.0	7.7	100.0	8.5	5,257
15–19	24.9	4.3	8.1	35.9	23.5	3.3	100.0	8.7	2,793
20–24	35.4	4.7	7.9	12.6	26.8	12.7	100.0	8.1	2,464
25–29	35.2	4.6	8.5	11.0	24.2	16.6	100.0	8.0	2,660
30–34	41.2	5.5	8.8	10.7	19.8	14.0	100.0	5.4	2,362
35–39	35.5	5.3	11.7	12.3	17.5	17.6	100.0	5.8	1,964
40–44	44.2	5.4	12.8	8.1	14.3	15.3	100.0	5.0	1,420
45–49	43.7	6.4	12.7	8.7	12.7	15.7	100.0	4.9	814
Residence									
Urban	19.0	4.0	7.7	18.1	27.8	23.4	100.0	11.0	4,641
Rural	43.5	5.5	10.3	14.7	18.1	8.0	100.0	5.1	9,835
Zone									
North Central	32.7	5.3	11.1	16.6	20.6	13.7	100.0	7.1	2,377
North East	57.6	6.5	6.7	10.1	11.8	7.3	100.0	0.0	2,399
North West	55.6	5.3	9.8	11.5	12.8	4.9	100.0	0.0	4,832
South East	2.8	4.3	11.5	23.9	39.0	18.4	100.0	11.2	1,111
South South	6.8	3.5	9.6	21.0	37.5	21.6	100.0	11.2	1,734
South West	8.0	3.6	8.7	22.9	29.6	27.2	100.0	11.2	2,023
Wealth quintile									
Lowest	79.5	4.6	7.1	5.8	2.8	0.3	100.0	0.0	2,651
Second	61.0	7.7	11.5	10.3	8.6	0.9	100.0	0.0	2,730
Middle	33.5	7.4	13.7	21.6	20.2	3.6	100.0	5.7	2,799
Fourth	12.5	5.0	11.3	24.7	34.3	12.3	100.0	10.5	3,006
Highest	2.1	0.9	4.4	15.3	35.7	41.5	100.0	11.7	3,289
Total	35.6	5.0	9.5	15.8	21.3	12.9	100.0	6.0	14,476

[1] No education includes informal education (adult education, Tsangaya, or Quranic).
[2] Completed grade 6 at the primary level
[3] Completed 6 years at the secondary level

Table 2.12.2 Formal 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 MIS 2021

State	Highest level of schooling						Total	Median years completed	Number of women
	No education[1]	Some primary	Completed primary[2]	Some secondary	Completed secondary[3]	More than secondary			
North Central									
FCT-Abuja	17.7	3.8	4.5	14.7	20.0	39.3	100.0	11.5	238
Benue	13.4	4.3	19.5	30.9	20.4	11.4	100.0	8.5	418
Kogi	15.4	11.6	13.5	19.4	30.7	9.5	100.0	8.8	251
Kwara	16.2	3.2	14.7	8.2	26.8	30.9	100.0	11.3	277
Nasarawa	44.9	5.1	5.8	13.1	21.0	10.1	100.0	5.0	358
Niger	59.2	5.8	9.3	11.9	10.3	3.5	100.0	0.0	537
Plateau	39.1	4.1	8.7	15.9	25.2	6.9	100.0	5.8	298
North East									
Adamawa	39.7	7.1	9.0	15.9	19.1	9.2	100.0	5.4	336
Bauchi	65.0	9.3	6.2	7.2	10.1	2.1	100.0	0.0	703
Borno	67.5	7.2	6.1	12.0	4.3	3.0	100.0	0.0	358
Gombe	51.2	4.1	4.4	13.5	18.7	8.1	100.0	0.0	279
Taraba	38.8	8.3	12.0	11.8	15.8	13.3	100.0	5.2	276
Yobe	67.2	1.5	4.1	5.6	8.3	13.3	100.0	0.0	447
North West									
Jigawa	56.0	6.2	4.8	9.3	13.8	10.0	100.0	0.0	566
Kaduna	21.4	6.2	13.2	20.9	24.9	13.3	100.0	8.7	690
Kano	49.1	6.6	11.4	16.4	14.4	2.0	100.0	1.6	920
Katsina	57.9	4.3	13.4	10.2	11.2	3.0	100.0	0.0	1,362
Kebbi	79.3	5.6	5.8	3.9	3.8	1.5	100.0	0.0	613
Sokoto	73.8	5.4	5.7	7.2	7.2	0.8	100.0	0.0	399
Zamfara	71.2	1.2	4.0	6.5	11.6	5.4	100.0	0.0	282
South East									
Abia	4.7	2.8	7.1	27.1	35.8	22.5	100.0	11.2	178
Anambra	1.4	2.8	6.4	11.8	49.4	28.1	100.0	11.6	283
Ebonyi	3.0	6.6	19.5	30.1	31.6	9.3	100.0	9.3	297
Enugu	4.2	6.0	14.8	30.3	30.6	14.1	100.0	10.3	204
Imo	1.0	2.0	6.2	22.1	49.2	19.4	100.0	11.4	149
South South									
Akwa Ibom	6.4	4.5	17.4	20.2	37.0	14.5	100.0	11.0	478
Bayelsa	8.4	4.2	10.5	23.2	33.8	19.8	100.0	11.1	131
Cross River	6.4	5.4	7.2	19.8	41.1	20.2	100.0	11.3	224
Delta	11.8	3.0	1.5	31.7	23.4	28.5	100.0	11.1	298
Edo	6.5	1.8	9.7	20.9	32.9	28.1	100.0	11.3	300
Rivers	2.4	2.1	6.7	11.8	55.6	21.5	100.0	11.5	304
South West									
Ekiti	3.7	1.1	8.5	21.8	36.9	28.0	100.0	11.4	123
Lagos	3.1	1.8	5.2	29.1	21.4	39.4	100.0	11.5	620
Ogun	13.4	14.8	5.1	22.0	20.7	24.0	100.0	9.9	308
Ondo	6.8	2.0	13.2	27.0	32.2	18.8	100.0	11.0	156
Osun	4.0	2.0	12.7	30.0	30.8	20.4	100.0	11.0	320
Oyo	14.7	1.2	11.3	10.3	41.8	20.7	100.0	11.3	497
Total	35.6	5.0	9.5	15.8	21.3	12.9	100.0	6.0	14,476

[1] No education includes informal education (adult education, Tsangaya, or Quranic).
[2] Completed grade 6 at the primary level
[3] Completed 6 years at the secondary level

Table 2.13.1 Informal schooling attendance of interviewed women: National

Among women age 15–49 with no formal education, percentage who attended informal schooling, and percent distribution of women age 15–49 who attended informal schooling by type of informal schooling attended, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of women who attended informal schooling	Number of women with no formal education	Type of informal schooling attended			Total	Number of women who attended informal schooling
			Adult education	Tsangaya	Quranic		
Age							
15–19	50.4	695	0.8	26.8	72.4	100.0	350
20–24	52.6	871	0.5	22.3	77.2	100.0	458
25–29	48.2	936	0.8	26.6	72.6	100.0	451
30–34	51.2	974	1.4	23.7	74.8	100.0	499
35–39	48.3	698	1.2	16.5	82.3	100.0	337
40–44	51.3	628	3.3	14.8	81.9	100.0	322
45–49	42.5	356	1.6	23.3	75.1	100.0	151
Residence							
Urban	55.9	882	1.1	16.7	82.2	100.0	494
Rural	48.6	4,274	1.3	23.6	75.0	100.0	2,075
Zone							
North Central	19.6	777	1.3	3.0	95.7	100.0	152
North East	46.0	1,383	0.5	41.1	58.4	100.0	636
North West	65.7	2,687	0.8	17.3	81.9	100.0	1,764
South East	(2.7)	(31)	*	*	*	100.0	1
South South	10.9	118	*	*	*	100.0	13
South West	1.9	161	*	*	*	100.0	3
Wealth quintile							
Lowest	43.4	2,107	0.8	25.2	74.0	100.0	915
Second	54.1	1,666	1.0	24.0	75.0	100.0	901
Middle	56.0	939	2.0	18.0	79.9	100.0	526
Fourth	53.3	376	3.2	15.1	81.7	100.0	200
Highest	39.0	69	*	*	*	100.0	27
Total	49.8	5,156	1.3	22.3	76.4	100.0	2,569

Note: 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 2.13.2 Informal schooling attendance of interviewed women: States

Among women age 15–49 with no formal education, percentage who attended informal schooling, and percent distribution of women age 15–49 who attended informal schooling by type of informal schooling attended, by state, Nigeria MIS 2021

State	Percentage of women who attended informal schooling	Number of women with no formal education	Type of informal schooling attended			Total	Number of women who attended informal schooling
			Adult education	Tsangaya	Quranic		
North Central							
FCT-Abuja	57.7	42	(2.6)	(10.5)	(86.9)	100.0	24
Benue	1.6	56	*	*	*	100.0	1
Kogi	9.7	39	*	*	*	100.0	4
Kwara	9.1	45	*	*	*	100.0	4
Nasarawa	18.0	161	(0.0)	(0.0)	(100.0)	100.0	29
Niger	22.9	318	0.6	2.7	96.7	100.0	73
Plateau	14.8	117	*	*	*	100.0	17
North East							
Adamawa	28.2	133	(0.0)	(4.4)	(95.6)	100.0	38
Bauchi	54.1	457	0.6	42.1	57.3	100.0	247
Borno	55.8	241	0.0	19.3	80.7	100.0	135
Gombe	25.8	143	3.8	61.1	35.1	100.0	37
Taraba	11.8	107	*	*	*	100.0	13
Yobe	55.4	301	0.0	63.6	36.4	100.0	166
North West							
Jigawa	63.2	317	0.0	24.9	75.1	100.0	200
Kaduna	68.7	148	1.5	1.6	96.9	100.0	102
Kano	82.8	452	0.3	18.2	81.5	100.0	375
Katsina	48.4	788	0.0	8.0	92.0	100.0	382
Kebbi	59.6	486	0.0	21.6	78.4	100.0	290
Sokoto	97.3	294	3.5	19.1	77.4	100.0	286
Zamfara	64.6	201	1.5	29.2	69.3	100.0	130
South East							
Abia	nc	nc	nc	nc	nc	nc	nc
Anambra	nc	nc	nc	nc	nc	nc	nc
Ebonyi	nc	nc	nc	nc	nc	nc	nc
Enugu	*	*	*	*	*	100.0	0
Imo	*	*	*	*	*	100.0	1
South South							
Akwa Ibom	*	*	*	*	*	100.0	10
Bayelsa	nc	nc	nc	nc	nc	nc	nc
Cross River	*	*	*	*	*	100.0	1
Delta	(5.1)	(35)	*	*	*	100.0	2
Edo	(0.0)	(20)	*	*	*	100.0	0
Rivers	nc	nc	nc	nc	nc	nc	nc
South West							
Ekiti	*	*	*	*	*	100.0	0
Lagos	nc	nc	nc	nc	nc	nc	nc
Ogun	2.8	41	*	*	*	100.0	1
Ondo	*	*	*	*	*	100.0	0
Osun	nc	nc	nc	nc	nc	nc	nc
Oyo	1.6	73	*	*	*	100.0	1
Total	49.8	5,156	1.3	22.3	76.4	100.0	2,569

Note: 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.
nc = No cases

Table 2.14.1 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 MIS 2021

Background characteristic	Higher than secondary schooling	No schooling, informal education only, primary school, or secondary school: Can read a whole sentence	Can read part of a sentence	Cannot read at all	No card with required language	Blind/visually impaired	Total	Percentage literate[1]	Number of women
Age									
15–24	7.7	30.3	23.3	38.4	0.1	0.1	100.0	61.3	5,257
15–19	3.3	36.4	26.0	34.1	0.0	0.1	100.0	65.7	2,793
20–24	12.7	23.4	20.2	43.3	0.2	0.1	100.0	56.4	2,464
25–29	16.6	21.0	20.9	41.4	0.1	0.0	100.0	58.5	2,660
30–34	14.0	16.8	19.7	49.2	0.1	0.2	100.0	50.5	2,362
35–39	17.6	15.9	22.4	43.8	0.2	0.2	100.0	55.8	1,964
40–44	15.3	12.3	18.8	53.1	0.1	0.3	100.0	46.4	1,420
45–49	15.7	12.3	19.6	52.2	0.2	0.0	100.0	47.6	814
Residence									
Urban	23.4	29.0	22.7	24.9	0.0	0.1	100.0	75.1	4,641
Rural	8.0	18.2	21.0	52.5	0.2	0.2	100.0	47.1	9,835
Zone									
North Central	13.7	17.6	20.6	47.8	0.2	0.1	100.0	52.0	2,377
North East	7.3	10.7	22.9	58.4	0.6	0.0	100.0	41.0	2,399
North West	4.9	13.7	18.7	62.6	0.0	0.2	100.0	37.2	4,832
South East	18.4	43.2	27.6	10.7	0.0	0.0	100.0	89.3	1,111
South South	21.6	40.1	21.1	16.8	0.0	0.3	100.0	82.9	1,734
South West	27.2	30.8	24.5	17.2	0.0	0.2	100.0	82.6	2,023
Wealth quintile									
Lowest	0.3	3.6	11.7	84.2	0.2	0.1	100.0	15.5	2,651
Second	0.9	8.1	21.8	68.9	0.2	0.1	100.0	30.8	2,730
Middle	3.6	20.9	26.9	48.2	0.2	0.3	100.0	51.3	2,799
Fourth	12.3	33.7	31.1	22.8	0.1	0.1	100.0	77.1	3,006
Highest	41.5	37.2	15.8	5.3	0.0	0.1	100.0	94.6	3,289
Total	12.9	21.7	21.5	43.7	0.1	0.1	100.0	56.1	14,476

[1] Refers to women who attended schooling higher than the secondary level and women with less schooling who can read a whole sentence or part of a sentence

Table 2.14.2 Literacy of interviewed women: States

Percent distribution of women age 15–49 by level of schooling attended and level of literacy, and percentage literate, according to background characteristics, Nigeria MIS 2021

Background characteristic	Higher than secondary schooling	No schooling, informal education only, primary school, or secondary school: Can read a whole sentence	Can read part of a sentence	Cannot read at all	No card with required language	Blind/visually impaired	Total	Percentage literate[1]	Number of women
North Central									
FCT-Abuja	10.7	18.7	31.9	38.8	0.0	0.0	100.0	61.2	669
Benue	11.4	18.6	34.5	35.5	0.0	0.0	100.0	64.5	418
Kogi	9.5	18.7	27.5	44.3	0.0	0.0	100.0	55.7	251
Kwara	30.9	19.0	23.3	26.7	0.0	0.0	100.0	73.3	277
Nasarawa	10.1	17.5	18.4	53.0	0.3	0.7	100.0	46.0	358
Niger	3.5	11.2	9.4	75.9	0.0	0.0	100.0	24.1	537
Plateau	6.9	20.5	21.3	51.4	0.0	0.0	100.0	48.6	298
North East									
Adamawa	9.2	17.1	20.4	53.2	0.0	0.0	100.0	46.8	336
Bauchi	2.1	10.5	20.9	66.4	0.0	0.0	100.0	33.6	703
Borno	3.0	3.2	17.9	74.9	1.0	0.0	100.0	24.1	358
Gombe	8.1	13.3	24.4	50.4	3.7	0.0	100.0	45.9	279
Taraba	13.3	20.5	20.8	45.4	0.0	0.0	100.0	54.6	276
Yobe	13.3	4.7	32.4	49.5	0.1	0.0	100.0	50.4	447
North West									
Jigawa	10.0	16.2	14.9	58.9	0.0	0.0	100.0	41.1	566
Kaduna	13.3	27.6	22.0	36.8	0.0	0.4	100.0	62.9	690
Kano	2.0	16.3	25.3	56.3	0.0	0.0	100.0	43.7	920
Katsina	3.0	8.2	15.1	73.4	0.0	0.4	100.0	26.2	1,362
Kebbi	1.5	8.3	19.6	70.5	0.0	0.0	100.0	29.5	613
Sokoto	0.8	9.1	11.8	78.3	0.0	0.0	100.0	21.7	399
Zamfara	5.4	10.5	21.9	62.2	0.0	0.0	100.0	37.8	282
South East									
Abia	22.5	49.6	19.5	8.4	0.0	0.0	100.0	91.6	178
Anambra	28.1	44.4	23.9	3.5	0.0	0.0	100.0	96.5	283
Ebonyi	9.3	39.3	29.1	22.3	0.0	0.0	100.0	77.7	297
Enugu	14.1	39.3	37.7	8.9	0.0	0.0	100.0	91.1	204
Imo	19.4	46.5	27.5	6.6	0.0	0.0	100.0	93.4	149
South South									
Akwa Ibom	14.5	43.2	27.8	13.8	0.0	0.8	100.0	85.4	478
Bayelsa	19.8	33.8	20.3	26.1	0.0	0.0	100.0	73.9	131
Cross River	20.2	34.7	24.5	20.6	0.0	0.0	100.0	79.4	224
Delta	28.5	37.9	15.5	17.6	0.0	0.3	100.0	82.0	298
Edo	28.1	34.5	16.4	20.9	0.0	0.0	100.0	79.1	300
Rivers	21.5	49.7	18.7	10.0	0.0	0.0	100.0	90.0	304
South West									
Ekiti	28.0	36.7	27.4	7.9	0.0	0.0	100.0	92.1	123
Lagos	39.4	32.3	16.1	11.5	0.0	0.7	100.0	87.8	620
Ogun	24.0	9.7	42.0	24.2	0.0	0.0	100.0	75.8	308
Ondo	18.8	29.2	32.2	19.7	0.0	0.0	100.0	80.3	156
Osun	20.4	37.1	22.8	19.8	0.0	0.0	100.0	80.2	320
Oyo	20.7	37.1	22.2	20.0	0.0	0.0	100.0	80.0	497
Total	12.9	21.7	21.5	43.7	0.1	0.1	100.0	56.1	14,476

[1] Refers to women who attended schooling higher than the secondary level and women with less schooling who can read a whole sentence or part of a sentence

Table 2.15 Exposure to mass media

Percentage of women age 15–49 who are exposed to specific media on a weekly basis, according to background characteristics, Nigeria MIS 2021

Background characteristic	Reads a newspaper at least once a week	Watches television at least once a week	Listens to the radio at least once a week	Accesses all three media at least once a week	Accesses none of the three media at least once a week	Number of women
Age						
15–19	6.6	28.9	18.1	3.3	62.8	2,793
20–24	6.5	28.3	19.0	3.3	62.8	2,464
25–29	7.5	31.1	21.9	4.5	60.8	2,660
30–34	8.3	28.2	25.7	5.3	60.7	2,362
35–39	7.2	31.4	26.9	5.0	57.9	1,964
40–44	6.0	26.9	23.1	3.8	62.7	1,420
45–49	7.8	27.8	24.2	4.5	62.5	814
Residence						
Urban	10.8	45.7	29.2	6.4	44.4	4,641
Rural	5.4	21.4	18.9	3.2	69.4	9,835
Zone						
North Central	9.1	32.9	29.3	5.3	55.0	2,377
North East	2.4	12.9	6.1	1.3	84.2	2,399
North West	3.8	14.4	16.4	1.7	74.6	4,832
South East	16.5	49.4	37.0	10.1	38.0	1,111
South South	9.1	50.3	29.1	6.8	42.6	1,734
South West	11.4	50.1	32.8	6.8	39.4	2,023
Education						
No education[1]	0.2	4.5	8.9	0.1	88.5	5,156
Primary	1.3	18.6	19.9	0.3	70.2	2,089
Secondary	9.3	43.8	28.8	5.0	45.3	5,364
More than secondary	26.5	67.0	42.5	17.6	22.9	1,867
Wealth quintile						
Lowest	0.4	1.0	5.2	0.1	94.4	2,651
Second	1.2	2.3	9.3	0.3	88.8	2,730
Middle	4.0	14.5	18.5	1.7	72.7	2,799
Fourth	9.2	46.5	33.4	5.0	41.3	3,006
Highest	18.2	70.8	39.6	12.2	20.8	3,289
Total	7.1	29.2	22.2	4.2	61.4	14,476

[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 2.16 Mobile phone ownership and internet usage

Percentage of women age 15–49 who own any mobile phone, who own a smart phone, who have ever used the internet, and who have used the internet in the last 12 months, and among women who have used the internet in the last 12 months, percent distribution by frequency of internet use in the last month, according to background characteristics, Nigeria MIS 2021

Background characteristic	Owns any mobile phone	Owns a smart phone	Ever used the internet	Used the internet in the last 12 months	Number of women	Among respondents who have used the internet in the last 12 months, percentage who, in the last month, used the internet: Almost every day	At least once a week	Less than once a week	Not at all	Total	Number of women
Age											
15–19	39.5	15.0	21.4	19.9	2,793	53.6	27.6	16.1	2.7	100.0	557
20–24	59.9	26.8	29.3	27.7	2,464	64.3	22.7	9.8	3.2	100.0	681
25–29	63.5	26.8	28.6	26.4	2,660	71.5	17.7	8.2	2.6	100.0	701
30–34	60.7	22.2	22.7	21.0	2,362	66.9	22.6	8.0	2.5	100.0	495
35–39	66.7	25.0	25.8	23.8	1,964	69.1	20.7	8.6	1.6	100.0	467
40–44	59.0	19.8	19.4	17.6	1,420	57.4	28.5	13.1	1.0	100.0	250
45–49	62.7	23.3	19.2	18.1	814	65.9	23.9	9.3	1.0	100.0	147
Residence											
Urban	75.8	38.8	41.3	38.8	4,641	67.1	22.3	8.2	2.5	100.0	1,800
Rural	49.2	15.0	16.7	15.3	9,835	61.7	23.2	12.8	2.4	100.0	1,500
Zone											
North Central	64.6	21.9	23.1	22.0	2,377	74.2	16.8	6.7	2.4	100.0	523
North East	44.6	10.6	11.0	10.3	2,399	62.3	22.9	11.4	3.4	100.0	247
North West	40.6	9.6	10.2	9.2	4,832	50.6	25.7	16.5	7.2	100.0	444
South East	75.6	34.5	38.4	35.9	1,111	65.4	25.6	8.0	1.1	100.0	399
South South	72.4	37.1	44.9	40.3	1,734	64.8	21.6	11.9	1.8	100.0	700
South West	83.8	50.2	51.7	48.8	2,023	66.0	24.0	9.0	1.0	100.0	988
Education											
No education[1]	29.5	1.6	1.0	0.7	5,156	(43.6)	(29.3)	(18.2)	(8.9)	100.0	34
Primary	57.8	6.3	5.2	4.2	2,089	33.2	29.9	28.9	8.0	100.0	87
Secondary	71.2	29.0	33.3	30.0	5,364	53.3	29.8	14.0	2.9	100.0	1,609
More than secondary	97.0	80.7	86.2	84.1	1,867	78.4	14.8	5.3	1.5	100.0	1,570
Wealth quintile											
Lowest	20.8	0.9	0.8	0.5	2,651	*	*	*	*	100.0	14
Second	33.7	2.9	2.9	2.4	2,730	27.3	39.1	24.2	9.3	100.0	65
Middle	56.4	8.2	10.3	8.9	2,799	33.2	35.4	27.5	3.9	100.0	248
Fourth	76.3	26.1	29.1	26.0	3,006	54.7	27.1	13.6	4.6	100.0	783
Highest	91.7	65.8	69.7	66.6	3,289	73.0	19.1	6.6	1.3	100.0	2,190
Total	57.7	22.7	24.6	22.8	14,476	64.6	22.7	10.3	2.4	100.0	3,300

Note: 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] No education includes informal education (adult education, Tsangaya, or Quranic).

MALARIA PREVENTION 3

Key Findings

- ***Ownership of insecticide-treated nets:*** 56% of households own at least one insecticide-treated net (ITN).
- ***Sources of ITNs:*** 79% of ITNs owned by households were obtained from a mass distribution campaign.
- ***Access to an ITN:*** 43% of the de facto population has access to an ITN in the household.
- ***Use of ITNs:*** 36% of the de facto population slept under an ITN the night before the survey.
- ***Use of ITNs by children under age 5:*** 41% of children under age 5 slept under an ITN the night before the survey.
- ***Use of ITNs by pregnant women:*** 50% of pregnant women age 15–49 slept under an ITN the night before the survey.
- ***Antenatal care coverage:*** 63% of women age 15–49 who gave birth in the 2 years preceding the survey received antenatal care (ANC) from a skilled provider during the pregnancy for their most recent birth. Fifty-two percent had at least four ANC visits.
- ***Intermittent preventive treatment (IPTp):*** 31% of women age 15–49 with a live birth in the 2 years preceding the survey reported taking three or more doses of sulfadoxine-pyrimethamine (SP)/Fansidar during their last pregnancy.

This chapter describes population coverage rates of some of the key malaria control interventions in Nigeria, including ownership, source, and use of mosquito nets and prophylactic use of antimalarial drugs among pregnant women. This is in line with Objective 1 of the 2014–2020 National Malaria Strategic Plan, which was to provide at least 80% of the targeted population with appropriate preventive measures by 2020 (NMEP 2013).

3.1 OWNERSHIP AND COVERAGE OF INSECTICIDE-TREATED NETS

Ownership of insecticide-treated nets

Households that have at least one insecticide-treated net (ITN). An ITN is defined as a factory-treated net that does not require any further treatment.

Sample: Households

Full household ITN coverage

Percentage of households with at least one ITN for every two people.

Sample: Households (with at least one person who stayed in the household the night before the survey)

ITNs repel and kill mosquitoes, thus providing protection against mosquito bites and reducing the transmission of malaria parasites. When high coverage of ITNs is achieved, ITNs help decrease malaria risk at the individual level as well as at the community level by reducing the vector population. The distribution and use of ITNs is one of the core interventions for preventing malaria infection in Nigeria.

ITNs, the primary vector control intervention in Nigeria, are distributed through mass campaigns and through routine platforms to pregnant women at antenatal care (ANC) facilities and children under age 5 during immunisations (NMEP 2020b).

ITN Mass Distribution Campaigns by States in Nigeria from 2009 to 2021

The ITN replacement strategy for Nigeria is every 3 years (NMEP 2013). However, many states have not been able to implement this strategy accordingly, since ITN distribution in Nigeria is donor driven. Hence, ITN mass distribution campaigns have occurred at different times in different states and not necessarily at 3-years intervals, as shown in **Figure 3.1**.

Figure 3.1 **Year of last ITN mass distribution by state**

State	Year of previous ITN campaign	Year of most recent ITN campaign	State	Year of previous ITN campaign	Year of most recent ITN campaign
Abia	2012	2015	Kano	2015	2019
Adamawa	2017	2021	Katsina	2015	2022
Akwa Ibom	2014	2018	Kebbi	2015	2018
Anambra	2014	2021	Kogi	2013	2017
Bauchi	2014	2018	Kwara	2017	2020
Bayelsa	2011	2011	Lagos	2011	2011
Benue	2016	2020	Nasarawa	2018	2022
Borno	2011	2011	Niger	2014	2019
Cross River	2015	2019	Ogun	2014	2018
Delta	2013	2019	Ondo	2017	2021
Ebonyi	2015	2019	Osun	2013	2020
Edo	2012	2017	Oyo	2016	2021
Ekiti	2009	2014	Plateau	2015	2020
Enugu	2011	2011	Rivers	2014	2014
FCT	2011	2011	Sokoto	2013	2017
Gombe	2018	2021	Taraba	2011	2019
Imo	2012	2017	Yobe	2011	2019
Jigawa	2018	2021	Zamfara	2015	2020
Kaduna	2015	2019			

Nationally, 58% of households have at least one mosquito net, while 56% have at least one ITN. This implies that almost all mosquito nets owned by households in Nigeria are ITNs. The average number of ITNs per household is 1.3 (**Table 3.1.1**).

Twenty-five percent of households have at least one ITN for every two persons who stayed in the household in the night preceding the survey. In other words, 25% of households own enough ITNs to cover all household members if it is assumed that one net is shared by two people (**Table 3.1.1** and **Figure 3.2**).

Thus, to ensure sufficient household coverage of one net per two persons, the scope of distribution needs to expand to reach the 44% of households that do not own any ITNs (**Figure 3.2**). In addition, the quantity of ITNs distributed needs to increase to provide sufficient ITNs for the 31% of households that own at least one ITN but have an insufficient supply for the number of household members.

Trends: The percentage of households that own at least one ITN increased from 8% in 2008 to 69% in 2015 before decreasing to 56% in 2021 (**Figure 3.3**).

Patterns by background characteristics

- Household ownership of ITNs is higher in rural (58%) than urban (53%) areas (**Table 3.1.1**).
- ITN ownership ranges from 44% in the highest wealth quintile to 68% in the second wealth quintile (**Figure 3.4**).
- By zone, household ownership of ITNs is highest in North West (76%) and lowest in South East (37%) (**Table 3.1.1**).
- By state, the percentage of households owning at least one ITN for every two persons who stayed in the household the night preceding the survey is highest in Adamawa (56%) and lowest in Rivers (6%) (**Table 3.1.2**).

Figure 3.2 Household coverage of ITNs

Percent distribution of households

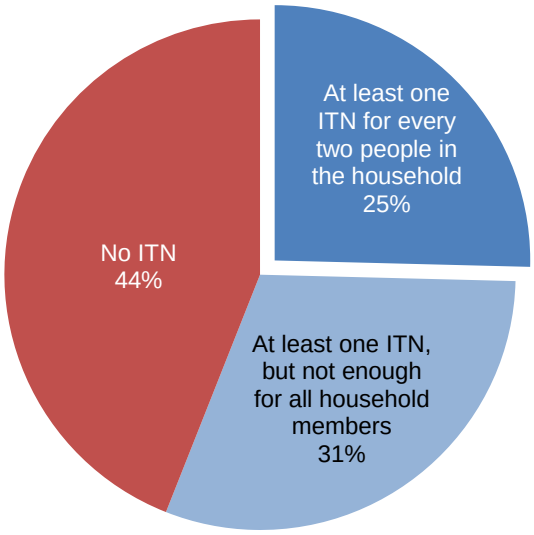
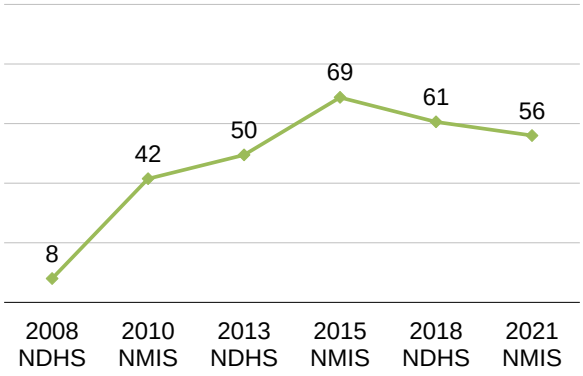


Figure 3.3 Trends in household ownership of ITNs

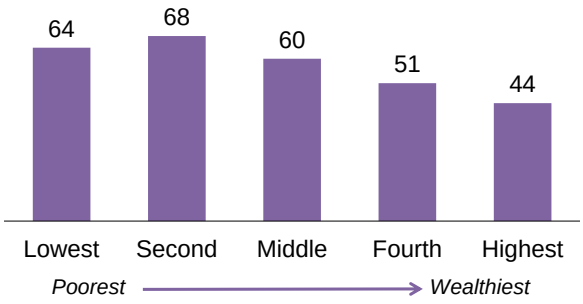
Percentage of households owning at least one ITN



Note: The definition of an ITN in surveys conducted prior to the 2015 NDHS included nets that had been soaked with insecticides within the past 12 months.

Figure 3.4 ITN ownership, by household wealth

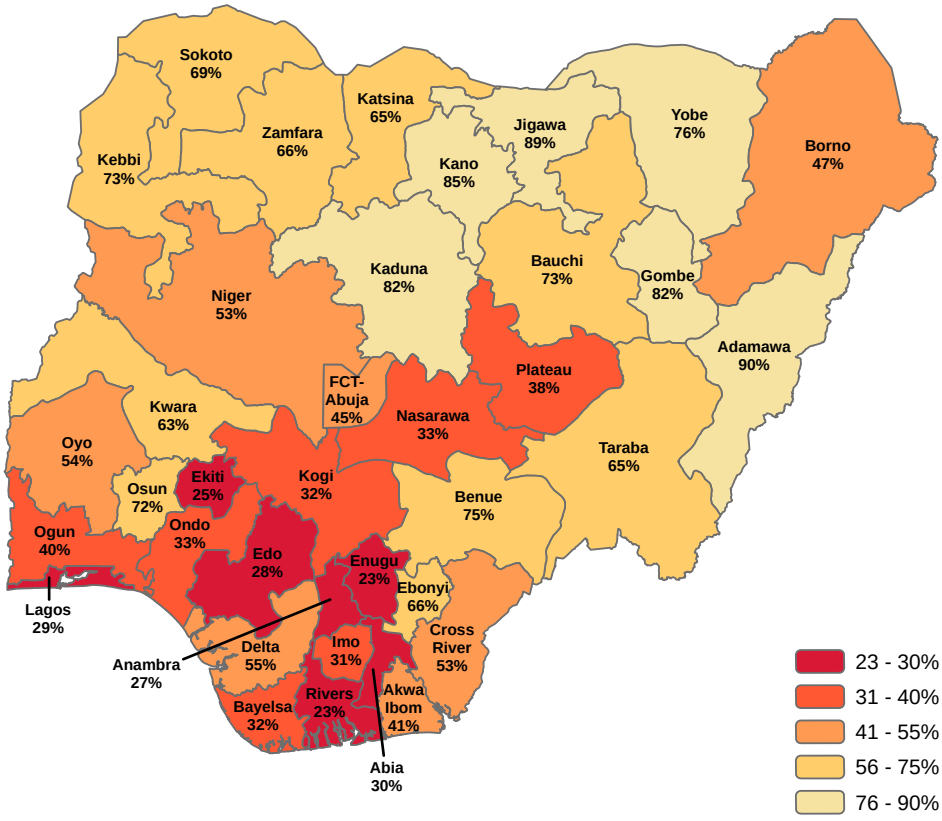
Percentage of households with at least one ITN



- By state, household ownership of an ITN is lowest in Rivers and Enugu (23%) and highest in Adamawa (90%). Only five states (Adamawa, Jigawa, Kano, Kaduna, and Gombe) have achieved the national target of 80% household ownership of ITNs (**Figure 3.5**).

Figure 3.5 **ITN ownership, by state**

Percentage of households with at least one ITN

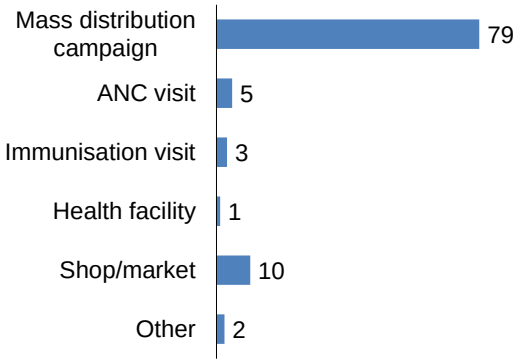


Source of Nets

Over three quarters (79%) of ITNs in Nigerian households were obtained through mass distribution campaigns, while 10% were obtained from shops/markets, 5% were obtained during ANC visits, 3% were obtained during immunisation visits, 2% were obtained from other sources, and 1% were obtained from government or private health facilities (**Table 3.2.1** and **Figure 3.6**).

Figure 3.6 **Source of ITNs**

Percent distribution of ITNs in interviewed households



Patterns by background characteristics

- Eighty percent of nets in rural areas and 74% in urban areas were obtained through mass distribution campaigns (**Table 3.2.1**).
- The percentage of households obtaining nets through mass campaigns is highest in Gombe (98%) and lowest in FCT-Abuja (13%) (**Table 3.2.2**).

- The percentage of households obtaining nets in a shop/market is highest in FCT-Abuja (63%) and lowest in Osun, Gombe, Ebonyi, Cross River, Imo, and Akwa Ibom (1% or less).

3.2 HOUSEHOLD ACCESS TO AND USE OF INSECTICIDE-TREATED NETS

Access to an ITN

Percentage of the population that could sleep under an ITN if each ITN in the household were used by up to two people.

Sample: De facto household population

Use of ITNs

Percentage of the population that slept under an ITN the night before the survey.

Sample: De facto household population

ITNs act as both a physical and a chemical barrier against mosquitoes. By reducing the vector population, ITNs can help reduce malaria risk at the community level, as well as reduce the risk to the individuals who use them.

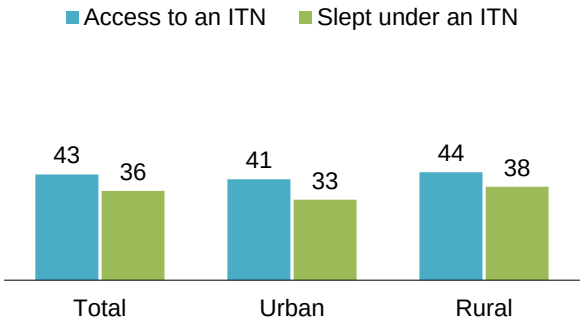
Access to an ITN is measured by the proportion of the population that could sleep under an ITN if each ITN in the household were used by up to two people. Comparing ITN access and ITN use indicators can help programmes identify behavioural gaps. Such gaps indicate that available ITNs are not being used. If the difference between these indicators is substantial, the programme may need to focus on behaviour change and on how to identify the main drivers of or barriers to ITN use to design appropriate interventions. These data help ITN programmes determine whether they need to achieve higher ITN coverage, promote ITN use, or both.

Nationally, 43% of de facto household members in Nigeria who stayed in the household the night before the survey could sleep inside an ITN if each ITN were used by up to two people (**Table 3.3.1**). The results showed that 36% of the population slept under an ITN the night before the survey (**Table 3.4.1** and **Figure 3.7**). There is only a small difference between ITN access and ITN use at the population level.

Overall, 75% of ITNs were used the night before the survey (**Table 3.5.1**).

Figure 3.7 **Access to and use of ITNs, by residence**

Percentage of the household population with access to an ITN and that slept under an ITN the night before the survey



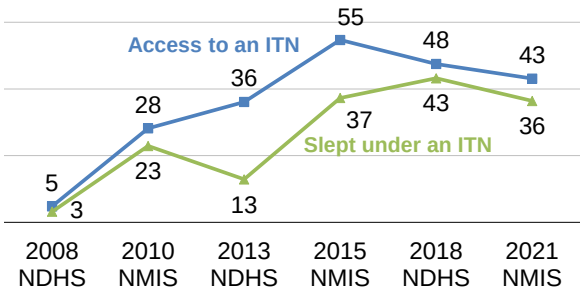
Trends: The proportion of the de facto population with access to an ITN in the household increased from 5% in 2008 to 55% in 2015 before decreasing to 43% in 2021. Similarly, ITN use increased from 3% in 2008 to 43% in 2018 before decreasing to 36% in 2021 (**Figure 3.8**).

Patterns by background characteristics

- Access to ITNs is higher in rural areas (44%) than in urban areas (41%) (**Table 3.3.1**).
- The percentage of household residents with access to an ITN ranges from 36% among those in the highest wealth quintile to 49% among those in the second wealth quintile.
- ITN access among the de facto population ranges from 17% in Rivers to 74% in Adamawa (**Table 3.3.2** and **Figure 3.9**).

Figure 3.8 Trends in ITN access and use

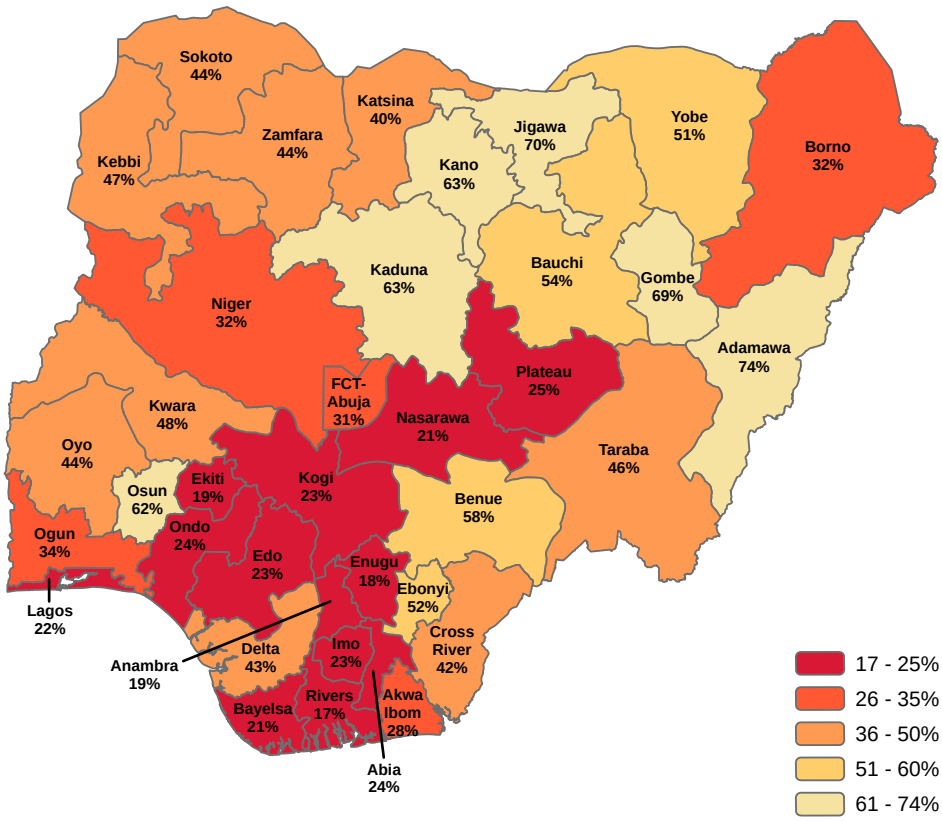
Percentage of the household population with access to an ITN and percentage of the population that slept under an ITN the night before the survey



Note: The definition of an ITN in surveys conducted prior to the 2015 NDHS included nets that had been soaked with insecticides within the past 12 months.

Figure 3.9 ITN access, by state

Percent of the household population that could sleep under an ITN if each ITN in the household were used by up to two people

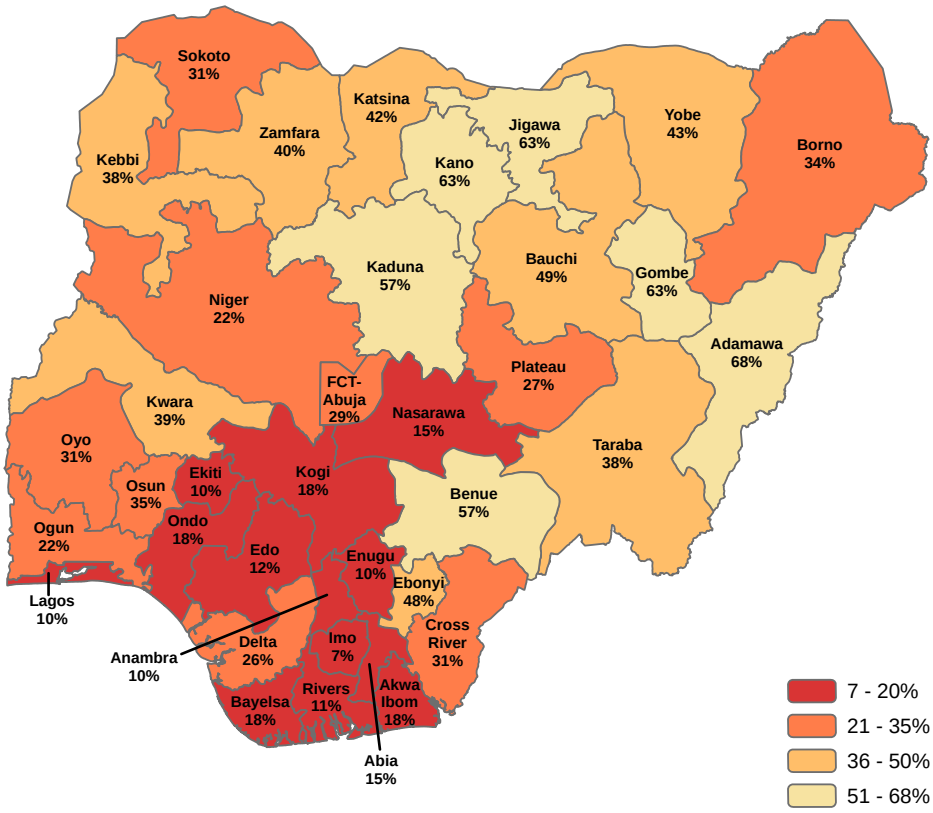


- A higher percentage of rural residents (38%) than urban residents (33%) slept under an ITN the night before the survey (**Table 3.4.1**).

- The percentage of the household population that slept under an ITN the night before the survey is highest in Adamawa (68%) and lowest in Imo (7%) (**Table 3.4.2** and **Figure 3.10**).

Figure 3.10 **ITN use, by state**

Percentage of the household population that slept under an ITN the previous night



- Use of ITNs decreases with increasing household wealth (**Table 3.4.1**). Use of existing ITNs is more common in households in the lowest wealth quintile (85%) than in households in the highest quintile (58%) (**Table 3.5.1**).

- Use of existing ITNs is highest in Borno (92%) and lowest in Imo (27%) (**Table 3.5.2**).

3.3 USE OF INSECTICIDE-TREATED NETS BY CHILDREN AND PREGNANT WOMEN

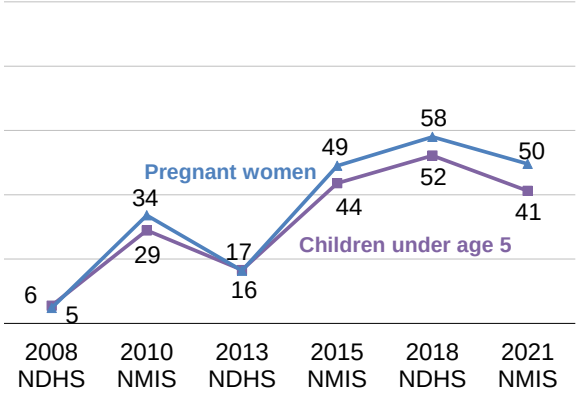
Malaria is endemic in Nigeria, and transmission occurs year-round. Pregnant women and children under age 5 are the populations most at risk. While ITN mass distribution campaigns target the general population, Nigeria also conducts routine distribution campaigns through health facilities that target pregnant women and children under age 5.

Forty-one percent of children less than age 5 and 50% of pregnant women slept under an ITN the night before the survey (**Table 3.6.1** and **Table 3.7.1**).

Trends: Use of ITNs among children under age 5 increased from 6% in 2008 to 52% in 2018 before decreasing to 41% in 2021. Similarly, use of ITNs by pregnant women increased from 5% in 2008 to 58% in 2018 and then decreased to 50% in 2021 (**Figure 3.11**).

***Figure 3.11* ITN use by children and pregnant women**

Percentage of children and pregnant women using an ITN the night before the survey



Note: The definition of an ITN in surveys conducted prior to the 2015 NDHS included nets that had been soaked with insecticides within the past 12 months.

Patterns by background characteristics

- The percentage of children who slept under an ITN decreases with increasing age, from 46% among those less than age 12 months to 38% among those age 48–59 months (**Table 3.6.1**).
- A higher percentage of children in rural (43%) than urban (38%) areas slept under an ITN the night before the survey.
- The proportion of children under age 5 who slept under an ITN the night before the survey is highest in North West (55%) and lowest in South West (22%).
- A higher percentage of pregnant women in rural (52%) than urban (44%) areas slept under an ITN the night before the survey (**Table 3.7.1**).
- The proportion of pregnant women who slept under an ITN the night before the survey is highest in North East (65%) and lowest in South South (21%).
- Children under age 5 from households in the second wealth quintile (48%) and pregnant women from households in the middle wealth quintile (57%) were more likely to have slept under an ITN the night before the survey than their counterparts in the highest wealth quintile (29% and 30%, respectively) (**Tables 3.6.1** and **3.7.1**).
- By state the proportion of children under age 5 who slept under an ITN the night before the survey ranges from 9% in Lagos to 65% in Gombe and Kano (**Table 3.6.2**).

3.4 Reasons Mosquito Nets Were Not Used

Table 3.8.1 presents reasons given by respondents for not sleeping under a mosquito net the night before the survey. This information is important to the National Malaria Elimination Programme (NMEP) and other stakeholders for identifying barriers to net use. Overall, 24% of mosquito nets were not used the night before the survey.

The main reasons given for not using a mosquito net the night before the survey were that net was not needed (24%), there were no mosquitoes (18%), it was too hot (16%) and other (12%).

Patterns by background characteristics

- The proportion of respondents reporting that they did not use a net the night before the survey because it was not needed was higher in rural (26%) than urban (20%) areas (**Table 3.8.1**).
- By zone, the proportion of respondents who reported that they did not use a net because it was not needed was highest in South East (35%) and lowest in North Central (16%).

- The proportion of respondents reporting that they did not use a net the night before the survey because it was not needed was highest in the lowest wealth quintile (30%) and lowest in the highest quintile (20%) (**Table 3.8.1**).
- By state, the percentage of respondents who reported not using a mosquito net because it was not needed ranges from 0% in Niger to 50% in Gombe (**Table 3.8.2**).
- Ten percent of respondents reported not using a net because it was too old/torn. By zone, this reason was most often reported by respondents in North West (16%) (**Table 3.8.1**).

3.5 MALARIA IN PREGNANCY

Malaria infection during pregnancy is a major public health problem in Nigeria, with substantial risks for the mother, her foetus, and the neonate. The World Health Organization (WHO) recommends a package of interventions for reducing the negative health effects associated with malaria in pregnancy (MIP): prompt diagnosis and treatment of confirmed infections, use of ITNs, and intermittent preventive treatment of malaria in pregnancy (IPTp) (WHO 2014b).

The 2021 NMIS assessed use of antenatal care services for the last birth in the 2 years preceding the survey and IPTp usage during the pregnancy for the last birth in the 2 years preceding the survey among women age 15–49.

3.5.1 Antenatal Care Coverage

Antenatal care (ANC) from a skilled provider

Pregnancy care received from skilled providers such as doctors, nurses/ midwives, and auxiliary nurses/midwives.

Sample: Women age 15–49 who had a live birth in the 2 years before the survey

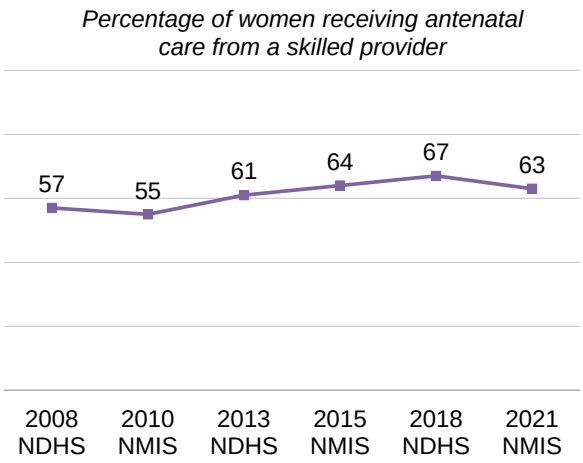
Health care services during pregnancy and childbirth and after delivery are important for the survival and well-being of both the mother and the infant. Ensuring access to a continuum of care for women during antenatal, intrapartum, and postpartum periods is critical for maternal and new-born survival and is a priority of the Federal Ministry of Health.

Access to quality ANC services during pregnancy can help prevent maternal death. ANC visits allow providers to identify and manage infections as well as obstetric complications and to provide preventive injections, medications, and supplements to women. During ANC visits, women receive education about health behaviours during pregnancy, counselling on pregnancy danger signs, and information on family planning.

Overall, 63% of women received antenatal care from a skilled provider for their last birth in the past 2 years (**Table 3.9.1**). Thirty percent received care from a doctor, 33% received care from a nurse/midwife or auxiliary midwife, and 9% received care from a community health worker (CHW). Less than 1% of women received care from a traditional birth attendant, and 24% did not receive antenatal care.

Trends: The proportion of women with a live birth in the 2 years preceding the survey who received antenatal care during the pregnancy for their most recent live birth from a skilled provider increased from 57% in 2008 to 67% in 2018 before decreasing slightly to 63% in 2021 (**Figure 3.12**).

Figure 3.12 **ANC from a skilled provider**



Patterns by background characteristics

- More women age 20–34 (66%) received antenatal care services from a skilled provider than women in other age groups (**Table 3.9.1**).
- Urban women (81%) were more likely than rural women (56%) to receive antenatal care from a skilled provider (**Table 3.9.1**).
- The proportion of pregnant women who received antenatal care from a skilled provider ranged from 24% in Katsina to 94% in FCT-Abuja (**Table 3.9.2**).
- Disparities along socioeconomic characteristics exist in use of ANC services. For example, 41% of women with no formal education received ANC services from a skilled provider, as compared with 94% of women with more than a secondary education.
- Women in the highest wealth quintile (93%) were more likely to receive ANC from a skilled provider than women in the lowest wealth quintile (37%) (**Table 3.9.2**).

3.5.2 Timing and Number of Antenatal Care Visits

Fifty-two percent of women had at least four ANC visits for their most recent birth in the 2 years preceding the survey (**Table 3.10.1**). The majority of women (42%) had their antenatal care visits in the fourth month to the seventh month of pregnancy. Only 26% of women started ANC in the first trimester, 7% did not seek care until the seventh month of pregnancy, and 24% did not seek care at all. Among those who received ANC, the median number of months pregnant at the first visit was 4.7 (**Table 3.10.1**).

Trends: The proportion of women who had at least four ANC visits for their most recent birth in the 2 years preceding the survey increased from 44% in 2008 to 56% in 2018 before decreasing to 52% in 2021.

Patterns by background characteristics

- Urban women (63%) were more likely than rural women (47%) to have had four or more ANC visits (**Table 3.10.1**).
- The proportion of women age 15–49 who reported having had at least four ANC visits ranges from 24% in Zamfara to 90% in Abia (**Table 3.10.2**).

3.5.3 Intermittent Preventive Treatment

Intermittent preventive treatment (IPTp) during pregnancy (IPTp3+)

Percentage of women who took at least three doses of SP/Fansidar during their last pregnancy.

Sample: Women age 15–49 with a live birth in the 2 years before the survey

Intermittent preventive treatment of malaria in pregnancy (IPTp) is a full therapeutic course of antimalarial medicine given to pregnant women at routine antenatal care visits to prevent malaria. IPTp helps prevent

maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality (WHO 2019).

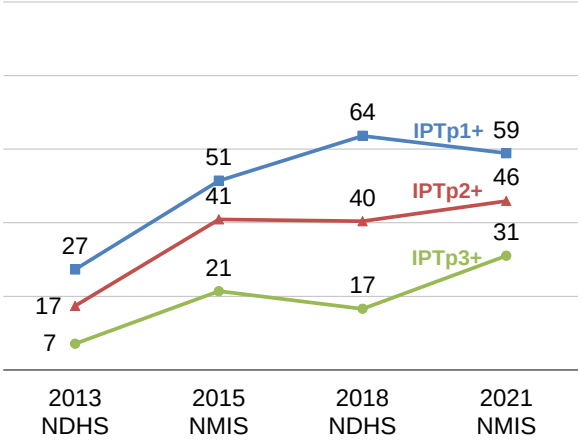
Sulfadoxine-pyrimethamine (SP) is the recommended medicine for IPTp in Nigeria. The Federal Ministry of Health has been implementing IPTp, defined as provision of at least two doses of SP/Fansidar to protect the mother and her child from malaria during routine antenatal care visits in the second and third trimesters of pregnancy (IPTp2+), for more than 15 years. In 2014, NMEP adopted the 2012 WHO recommendation to administer one dose of SP/Fansidar at each antenatal care visit after the first trimester, with at least a 1-month interval. The household survey indicator used to measure coverage of this intervention was the percentage of women with a live birth in the 2 years preceding the survey who received three or more doses of SP/Fansidar (IPTp3+) to prevent malaria during their most recent pregnancy.

Fifty-nine percent of women with a live birth in the 2 years preceding the survey reported having taken one or more doses of SP/Fansidar; 46% reported taking two or more doses, and 31% reported taking three or more doses (**Table 3.11.1**).

Trends: The percentage of pregnant women who reported taking one or more doses of SP/Fansidar increased from 27% in 2013 to 64% in 2018 but then decreased slightly to 59% in 2021. There were increases between 2013 and 2021 in the percentage of women taking two or more doses (from 17% to 46%) and three or more doses (from 7% to 31%) (**Figure 3.13**).

Figure 3.13 **Trends in IPTp use**

Percentage of women with a live birth in the 2 years before the survey who received at least 1, 2, or 3 doses of SP/Fansidar



Patterns by background characteristics

- The proportion of women with a live birth in the 2 years preceding the survey who received three or more doses of SP/Fansidar is higher in urban areas (39%) than in rural areas (28%) (**Table 3.11.1**).
- Forty-one percent of women in South East received three or more doses of SP/Fansidar, as compared with 27% of women in North East (**Table 3.11.1**).
- The percentages of women receiving one or more, two or more, and three or more doses of SP/Fansidar increase with increasing education and wealth (**Table 3.11.1**).
- The proportion of women receiving three or more doses is highest in Anambra (52%) and lowest in Akwa Ibom (7%) (**Table 3.11.2**).

LIST OF TABLES

For more information on malaria prevention, see the following tables:

Table 3.1.1 Household possession of mosquito nets: National

Percentage of households with at least one mosquito net (treated or untreated) and insecticide-treated net (ITN), average number of nets and ITNs per household, and percentage of households with at least one net and ITN per two persons who stayed in the household last night, according to background characteristics, Nigeria MIS 2021

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]	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	
Residence								
Urban	55.2	52.8	1.2	1.2	4,546	25.4	23.8	4,521
Rural	59.0	57.5	1.4	1.4	9,181	27.2	26.2	9,154
Zone								
North Central	51.8	49.9	1.1	1.0	2,210	21.3	20.3	2,202
North East	74.1	72.0	1.9	1.9	2,089	34.6	32.9	2,085
North West	77.6	75.8	2.0	2.0	3,629	32.3	31.1	3,624
South East	36.9	36.9	0.8	0.7	1,356	18.8	18.6	1,349
South South	40.0	39.3	0.8	0.7	2,037	19.5	19.2	2,034
South West	45.9	42.5	1.0	0.9	2,406	26.2	24.1	2,381
Wealth quintile								
Lowest	65.5	64.0	1.7	1.6	2,219	25.5	24.3	2,219
Second	69.6	68.3	1.7	1.7	2,365	28.0	27.4	2,363
Middle	61.3	59.9	1.4	1.4	2,707	28.7	27.9	2,698
Fourth	53.0	50.9	1.2	1.2	3,018	26.6	25.2	3,001
Highest	45.8	43.5	1.0	0.9	3,418	24.5	22.9	3,394
Total	57.7	56.0	1.4	1.3	13,727	26.6	25.4	13,675

[1] De facto household members
[2] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.1.2 Household possession of mosquito nets: States

Percentage of households with at least one mosquito net (treated or untreated) and insecticide-treated net (ITN), average number of nets and ITNs per household, and percentage of households with at least one net and ITN per two persons who stayed in the household last night, by state, Nigeria MIS 2021

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]	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	
North Central								
FCT-Abuja	48.2	45.0	0.9	0.8	202	14.4	12.4	198
Benue	74.8	74.8	1.7	1.7	381	38.5	38.5	381
Kogi	34.2	31.5	0.7	0.6	286	14.8	13.2	285
Kwara	64.8	62.9	1.3	1.2	298	29.9	29.2	298
Nasarawa	36.9	33.4	0.8	0.7	290	13.2	11.4	290
Niger	54.4	53.3	1.2	1.2	442	16.7	16.0	440
Plateau	39.5	37.8	0.7	0.7	311	16.4	15.1	309
North East								
Adamawa	90.2	90.2	2.4	2.3	334	56.9	55.9	334
Bauchi	74.7	72.7	2.0	1.9	591	34.0	32.3	587
Borno	52.3	47.4	1.0	0.9	339	10.1	8.9	339
Gombe	82.1	81.7	2.6	2.6	239	44.4	44.0	239
Taraba	69.2	64.6	1.6	1.4	258	35.1	30.0	258
Yobe	77.0	76.4	2.0	1.9	328	30.9	29.8	328
North West								
Jigawa	89.1	88.5	2.6	2.6	433	49.0	48.4	433
Kaduna	83.3	82.3	2.2	2.1	581	41.9	41.4	579
Kano	86.8	85.3	2.5	2.5	683	39.2	38.7	683
Katsina	64.9	64.6	1.7	1.7	871	19.2	18.9	871
Kebbi	78.1	72.9	1.7	1.6	474	22.0	19.5	471
Sokoto	73.5	68.5	1.7	1.6	374	31.6	27.5	374
Zamfara	67.6	66.3	1.6	1.6	214	27.2	26.1	212
South East								
Abia	30.5	30.3	0.6	0.6	206	15.2	15.0	205
Anambra	26.7	26.7	0.4	0.4	325	12.6	12.1	324
Ebonyi	66.2	66.2	1.5	1.5	334	32.9	32.7	334
Enugu	22.8	22.8	0.4	0.4	279	11.3	11.3	275
Imo	30.9	30.9	0.7	0.6	211	19.5	19.5	211
South South								
Akwa Ibom	41.9	41.3	0.8	0.8	585	22.5	22.3	585
Bayelsa	37.8	31.6	0.7	0.6	129	16.6	14.2	129
Cross River	52.9	52.9	1.0	1.0	274	26.0	26.0	274
Delta	54.8	54.8	1.0	1.0	373	28.0	28.0	372
Edo	28.0	27.9	0.6	0.6	311	15.0	14.6	310
Rivers	22.8	22.6	0.4	0.4	364	5.8	5.6	363
South West								
Ekiti	25.4	25.4	0.4	0.4	151	8.7	8.7	149
Lagos	38.3	29.0	0.7	0.5	811	19.0	13.2	796
Ogun	39.7	39.7	0.8	0.8	375	21.6	21.6	372
Ondo	33.4	32.8	0.7	0.7	167	15.6	15.6	167
Osun	72.2	71.9	2.0	2.0	340	53.2	52.6	338
Oyo	54.1	53.7	1.2	1.1	562	30.8	30.5	559
Total	57.7	56.0	1.4	1.3	13,727	26.6	25.4	13,675

[1] De facto household members
[2] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.2.1 Source of mosquito nets: National

Percent distribution of insecticide-treated nets (ITNs), non-ITNs, and all mosquito nets by source of net, according to background characteristics, Nigeria MIS 2021

Background characteristic	Mass distri-bution cam-paign	ANC visit	Immu-nisation visit	Govern-ment health facility	Private health facility	Phar-macy	Shop/ market	Com-munity health worker	Reli-gious insti-tution	School	Other	Don't know	Total	Number of mosquito nets
							ITNs[1]							
Residence														
Urban	74.0	5.6	2.3	1.4	0.3	0.5	12.7	0.1	0.2	0.1	2.0	0.9	100.0	5,314
Rural	80.3	4.4	3.5	0.8	0.1	0.1	9.0	0.0	0.0	0.1	1.4	0.2	100.0	12,780
Zone														
North Central	80.2	2.2	2.4	0.1	0.0	0.5	13.1	0.0	0.1	0.0	1.2	0.2	100.0	2,306
North East	82.4	2.8	2.1	0.2	0.0	0.0	11.3	0.0	0.0	0.0	1.2	0.0	100.0	3,882
North West	74.9	6.3	3.8	1.4	0.0	0.2	11.1	0.0	0.0	0.2	1.9	0.2	100.0	7,212
South East	80.7	4.0	3.1	0.9	0.1	0.1	8.6	0.0	0.2	0.0	1.7	0.5	100.0	1,013
South South	74.8	8.5	6.6	1.6	0.4	0.5	4.8	0.0	0.2	0.0	1.8	0.8	100.0	1,518
South West	83.0	3.5	1.4	1.6	0.7	0.2	5.9	0.1	0.1	0.3	1.6	1.5	100.0	2,163
Wealth quintile														
Lowest	77.3	4.4	3.1	0.8	0.0	0.0	11.4	0.0	0.0	0.3	2.6	0.1	100.0	3,595
Second	80.8	4.5	2.9	1.0	0.0	0.2	9.4	0.0	0.0	0.1	1.1	0.0	100.0	4,002
Middle	81.7	4.0	3.4	0.7	0.0	0.0	8.9	0.0	0.1	0.0	1.0	0.1	100.0	3,792
Fourth	80.9	5.2	3.4	0.5	0.0	0.2	7.7	0.1	0.0	0.1	1.5	0.4	100.0	3,491
Highest	70.3	5.9	3.0	2.1	0.8	0.8	13.4	0.1	0.2	0.1	1.9	1.5	100.0	3,216
Total	78.5	4.7	3.2	1.0	0.1	0.2	10.1	0.0	0.1	0.1	1.6	0.4	100.0	18,095
							NON-ITNs							
Total	na	na	na	na	0.0	1.6	77.1	0.0	0.9	0.0	12.0	8.4	100.0	614
							ALL MOSQUITO NETS							
Total	75.9	4.6	3.1	1.0	0.1	0.3	12.3	0.0	0.1	0.1	2.0	0.7	100.0	18,709

ANC = Antenatal care
na = Not applicable
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.2.2 Source of mosquito nets: States

Percent distribution of insecticide-treated nets (ITNs) by source of net, by state, Nigeria MIS 2021

State	Mass distri-bution cam-paign	ANC visit	Immu-nisation visit	Govern-ment health facility	Private health facility	Phar-macy	Shop/ market	Com-munity health worker	Reli-gious insti-tution	School	Other	Don't know	Total	Number of mosquito nets
North Central														
FCT-Abuja	13.4	6.6	7.6	0.0	0.4	0.7	63.4	0.0	1.4	0.3	5.5	0.5	100.0	159
Benue	93.1	0.3	0.0	0.0	0.0	0.3	5.0	0.0	0.0	0.0	1.3	0.0	100.0	648
Kogi	81.6	0.8	1.3	0.7	0.0	0.0	15.4	0.0	0.0	0.0	0.2	0.0	100.0	176
Kwara	86.7	2.7	1.9	0.0	0.0	2.5	3.7	0.0	0.0	0.0	2.5	0.0	100.0	370
Nasarawa	75.0	5.2	3.9	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0	0.3	100.0	201
Niger	78.1	1.1	4.3	0.4	0.0	0.0	15.8	0.0	0.0	0.0	0.0	0.4	100.0	541
Plateau	88.3	4.6	0.8	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.8	0.0	100.0	210
North East														
Adamawa	94.0	1.1	1.1	0.0	0.0	0.0	2.4	0.0	0.0	0.0	1.3	0.0	100.0	784
Bauchi	82.5	3.1	4.6	0.2	0.0	0.0	8.3	0.0	0.0	0.0	1.3	0.0	100.0	1,149
Borno	54.7	2.5	0.6	2.1	0.0	0.0	35.4	0.0	0.0	0.0	4.7	0.0	100.0	322
Gombe	97.8	1.6	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	100.0	629
Taraba	74.9	4.4	4.3	0.0	0.0	0.0	15.9	0.0	0.0	0.0	0.3	0.2	100.0	366
Yobe	71.0	4.6	0.1	0.1	0.0	0.0	23.7	0.0	0.0	0.0	0.5	0.0	100.0	633
North West														
Jigawa	80.3	8.2	2.0	0.2	0.1	0.1	7.3	0.0	0.1	0.0	0.8	1.0	100.0	1,105
Kaduna	78.0	5.7	4.7	5.7	0.1	0.0	4.4	0.2	0.1	0.0	1.0	0.1	100.0	1,237
Kano	85.4	3.4	0.5	0.2	0.0	0.0	9.9	0.0	0.0	0.1	0.5	0.0	100.0	1,686
Katsina	65.6	11.2	10.1	0.5	0.0	0.0	11.2	0.0	0.0	0.0	1.3	0.0	100.0	1,486
Kebbi	57.2	2.1	1.5	2.3	0.0	0.0	24.0	0.0	0.0	1.3	11.2	0.4	100.0	768
Sokoto	68.7	5.4	3.8	0.1	0.0	0.0	21.6	0.0	0.0	0.0	0.1	0.2	100.0	588
Zamfara	84.7	5.5	0.6	0.0	0.0	3.9	5.2	0.0	0.0	0.0	0.2	0.0	100.0	342
South East														
Abia	70.5	4.6	2.7	4.2	0.4	0.5	10.6	0.0	1.3	0.0	5.2	0.0	100.0	130
Anambra	54.8	3.0	7.4	0.6	0.0	0.5	32.2	0.0	0.0	0.0	0.0	1.5	100.0	142
Ebonyi	92.5	3.0	2.8	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.7	100.0	501
Enugu	58.4	11.5	0.8	2.0	0.0	0.0	24.2	0.0	0.0	0.0	3.1	0.0	100.0	104
Imo	90.9	2.2	2.2	0.4	0.0	0.0	0.5	0.0	0.0	0.0	3.9	0.0	100.0	137
South South														
Akwa Ibom	95.6	1.2	0.5	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.9	100.0	467
Bayelsa	26.9	14.5	16.6	5.7	0.0	4.8	15.2	0.0	3.0	1.0	10.9	1.4	100.0	71
Cross River	66.4	15.4	17.5	0.2	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	100.0	274
Delta	71.5	11.1	4.2	2.1	0.0	0.8	7.2	0.0	0.3	0.0	1.3	1.4	100.0	389
Edo	78.8	5.0	5.8	1.5	3.0	0.0	2.5	0.0	0.0	0.0	3.1	0.3	100.0	181
Rivers	49.4	13.6	8.2	6.6	0.0	0.8	16.9	0.0	0.0	0.0	3.3	1.2	100.0	136
South West														
Ekiti	74.6	10.0	3.8	3.7	0.0	0.7	3.4	2.0	0.0	1.9	0.0	0.0	100.0	61
Lagos	41.3	9.4	2.8	5.9	4.0	0.7	23.9	0.0	0.6	1.5	4.6	5.2	100.0	403
Ogun	93.8	1.3	0.4	1.0	0.0	0.0	3.2	0.0	0.0	0.0	0.2	0.0	100.0	281
Ondo	69.5	13.9	5.5	0.0	0.0	0.6	6.1	0.0	0.8	0.0	3.7	0.0	100.0	111
Osun	94.2	0.2	1.3	0.8	0.0	0.0	0.1	0.2	0.0	0.0	1.6	1.6	100.0	670
Oyo	96.1	1.9	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	100.0	637
Total	78.5	4.7	3.2	1.0	0.1	0.2	10.1	0.0	0.1	0.1	1.6	0.4	100.0	18,095

Note: An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).
ANC = Antenatal care

Table 3.3.1 Access to an insecticide-treated net (ITN): National

Percentage of the de facto population with access to an ITN in the household, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of the de facto population with access to an ITN[1,2]	Number of persons
Residence		
Urban	41.1	22,215
Rural	44.0	50,042
Zone		
North Central	34.1	11,843
North East	53.9	12,609
North West	52.4	24,618
South East	29.2	5,546
South South	29.4	8,240
South West	35.6	9,402
Wealth quintile		
Lowest	45.0	14,464
Second	49.3	14,468
Middle	44.7	14,439
Fourth	40.3	14,456
Highest	36.1	14,430
Total	43.1	72,258

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).
[2] Percentage of the de facto household population that could sleep under an ITN if each ITN in the household were used by up to two people

Table 3.3.2 Access to an insecticide-treated net (ITN): States

Percentage of the de facto population with access to an ITN in the household, by state, Nigeria MIS 2021

State	Percentage of the de facto population with access to an ITN[1,2]	Number of persons
North Central		
FCT-Abuja	31.1	954
Benue	58.3	1,857
Kogi	22.6	1,308
Kwara	48.1	1,278
Nasarawa	20.5	1,816
Niger	31.9	3,139
Plateau	25.4	1,490
North East		
Adamawa	73.9	1,762
Bauchi	54.4	3,759
Borno	31.5	1,947
Gombe	68.5	1,580
Taraba	45.8	1,333
Yobe	51.2	2,228
North West		
Jigawa	69.6	2,709
Kaduna	63.3	3,246
Kano	63.3	4,869
Katsina	40.0	7,009
Kebbi	46.9	3,048
Sokoto	44.3	2,320
Zamfara	43.7	1,417
South East		
Abia	24.1	814
Anambra	18.5	1,299
Ebonyi	52.3	1,532
Enugu	17.6	1,001
Imo	22.8	901
South South		
Akwa Ibom	28.1	2,388
Bayelsa	21.4	575
Cross River	41.8	1,097
Delta	43.0	1,476
Edo	23.2	1,263
Rivers	16.9	1,442
South West		
Ekiti	19.4	579
Lagos	22.1	2,863
Ogun	33.7	1,381
Ondo	24.2	738
Osun	61.8	1,445
Oyo	44.4	2,395
Total	43.1	72,258

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).
[2] Percentage of the de facto household population that could sleep under an ITN if each ITN in the household were used by up to two people

Table 3.4.1 Use of mosquito nets by persons in the household: National

Percentage of the de facto household population that slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among the de facto household population in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Nigeria MIS 2021

	Household population			Household population in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of persons	Percentage who slept under an ITN[1] last night	Number of persons
Age					
<5	42.3	41.2	12,742	64.3	8,159
5–14	36.1	35.0	21,262	55.2	13,469
15–34	36.1	35.0	20,792	57.4	12,675
35–49	38.2	37.3	9,249	63.5	5,424
50+	36.9	36.1	7,935	62.6	4,578
Don't know	22.2	20.5	279	49.9	115
Sex					
Male	35.3	34.3	36,159	56.2	22,039
Female	39.7	38.6	36,099	62.3	22,381
Residence					
Urban	34.1	32.8	22,215	56.0	12,991
Rural	39.0	38.1	50,042	60.6	31,429
Zone					
North Central	29.8	28.8	11,843	55.9	6,108
North East	50.4	48.8	12,609	65.5	9,392
North West	50.0	48.8	24,618	64.3	18,714
South East	20.9	20.9	5,546	50.5	2,295
South South	19.2	18.9	8,240	44.8	3,475
South West	22.8	21.5	9,402	45.5	4,435
Wealth quintile					
Lowest	42.8	41.7	14,464	62.2	9,698
Second	45.8	45.0	14,468	63.3	10,279
Middle	41.4	40.5	14,439	63.5	9,215
Fourth	32.9	31.7	14,456	55.9	8,198
Highest	24.5	23.3	14,430	47.8	7,030
Total	37.5	36.4	72,258	59.3	44,420

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.4.2 Use of mosquito nets by persons in the household: States

Percentage of the de facto household population that slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among the de facto household population in households with at least one ITN, percentage who slept under an ITN the night before the survey, by state, Nigeria MIS 2021

	Household population			Household population in households with at least one ITN[1]	
State	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of persons	Percentage who slept under an ITN[1] last night	Number of persons
North Central					
FCT-Abuja	32.5	28.6	954	55.9	488
Benue	56.8	56.6	1,857	73.4	1,434
Kogi	18.9	18.0	1,308	52.2	451
Kwara	39.6	39.0	1,278	56.6	880
Nasarawa	16.1	14.5	1,816	44.7	590
Niger	22.7	22.1	3,139	40.9	1,694
Plateau	27.5	26.7	1,490	69.6	571
North East					
Adamawa	67.7	67.5	1,762	74.1	1,605
Bauchi	51.5	48.9	3,759	64.9	2,832
Borno	36.7	34.2	1,947	66.5	1,002
Gombe	63.9	63.3	1,580	72.8	1,373
Taraba	40.9	38.2	1,333	54.3	939
Yobe	43.2	42.7	2,228	57.9	1,641
North West					
Jigawa	64.2	63.4	2,709	70.8	2,428
Kaduna	58.0	57.1	3,246	68.1	2,721
Kano	63.8	63.0	4,869	73.8	4,158
Katsina	42.0	41.8	7,009	63.7	4,597
Kebbi	42.2	38.2	3,048	51.5	2,261
Sokoto	33.1	31.1	2,320	45.4	1,592
Zamfara	41.2	40.2	1,417	59.6	957
South East					
Abia	15.4	15.3	814	47.9	260
Anambra	10.3	10.3	1,299	36.4	368
Ebonyi	48.1	48.1	1,532	66.0	1,117
Enugu	9.8	9.8	1,001	36.1	272
Imo	7.4	7.4	901	23.9	279
South South					
Akwa Ibom	17.9	17.8	2,388	43.8	968
Bayelsa	21.4	17.9	575	53.8	192
Cross River	30.6	30.6	1,097	51.6	651
Delta	26.2	26.2	1,476	44.5	870
Edo	12.5	12.3	1,263	38.3	404
Rivers	10.6	10.5	1,442	38.8	391
South West					
Ekiti	10.0	9.9	579	28.5	200
Lagos	13.7	9.6	2,863	29.9	916
Ogun	21.7	21.7	1,381	48.7	617
Ondo	17.9	17.7	738	50.1	260
Osun	35.3	35.3	1,445	48.0	1,063
Oyo	31.5	31.2	2,395	54.2	1,379
Total	37.5	36.4	72,258	59.3	44,420

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.5.1 Use of existing ITNs: National

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
Residence		
Urban	70.8	5,314
Rural	76.8	12,780
Zone		
North Central	77.4	2,306
North East	82.0	3,882
North West	84.0	7,212
South East	57.0	1,013
South South	55.9	1,518
South West	52.6	2,163
Wealth quintile		
Lowest	84.6	3,595
Second	81.8	4,002
Middle	78.4	3,792
Fourth	70.1	3,491
Highest	57.6	3,216
Total	75.1	18,095

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.5.2 Use of existing ITNs: States

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, by state, Nigeria MIS 2021

State	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
North Central		
FCT-Abuja	82.3	159
Benue	87.2	648
Kogi	74.9	176
Kwara	69.1	370
Nasarawa	66.4	201
Niger	72.3	541
Plateau	84.0	210
North East		
Adamawa	84.8	784
Bauchi	84.7	1,149
Borno	91.6	322
Gombe	79.4	629
Taraba	72.3	366
Yobe	76.6	633
North West		
Jigawa	88.3	1,105
Kaduna	77.6	1,237
Kano	90.8	1,686
Katsina	89.8	1,486
Kebbi	73.6	768
Sokoto	64.3	588
Zamfara	90.8	342
South East		
Abia	50.2	130
Anambra	63.6	142
Ebonyi	65.9	501
Enugu	53.4	104
Imo	26.5	137
South South		
Akwa Ibom	53.3	467
Bayelsa	70.8	71
Cross River	66.9	274
Delta	53.8	389
Edo	45.9	181
Rivers	54.0	136
South West		
Ekiti	52.9	61
Lagos	36.8	403
Ogun	65.5	281
Ondo	63.3	111
Osun	43.2	670
Oyo	64.7	637
Total	75.1	18,095

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.6.1 Use of mosquito nets by children: National

Percentage of children under age 5 who slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among children under age 5 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Nigeria MIS 2021

	Children under age 5 in all households			Children under age 5 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age in months					
<12	47.6	46.1	2,273	69.1	1,516
12–23	42.5	41.2	2,262	63.9	1,458
24–35	42.0	41.0	2,457	62.9	1,602
36–47	42.0	40.6	2,645	64.4	1,668
48–59	38.9	38.2	3,104	61.9	1,914
Sex					
Male	42.0	40.9	6,509	64.1	4,154
Female	42.7	41.5	6,233	64.5	4,005
Residence					
Urban	38.7	37.5	3,545	62.1	2,140
Rural	43.7	42.6	9,196	65.1	6,019
Zone					
North Central	31.9	30.5	2,212	60.8	1,110
North East	53.0	50.8	2,264	67.5	1,702
North West	55.5	54.6	4,618	70.0	3,602
South East	29.5	29.5	994	60.6	483
South South	24.0	23.7	1,357	49.3	654
South West	23.7	22.2	1,296	47.2	609
Wealth quintile					
Lowest	46.3	45.2	2,772	67.3	1,860
Second	49.2	48.3	2,784	66.9	2,012
Middle	45.0	43.9	2,660	67.0	1,743
Fourth	38.3	36.7	2,313	61.1	1,391
Highest	29.7	28.6	2,213	54.8	1,153
Total	42.3	41.2	12,742	64.3	8,159

Note: Table is based on children who stayed in the household the night before the interview.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.6.2 Use of mosquito nets by children: States

Percentage of children under age 5 who slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among children under age 5 in households with at least one ITN, percentage who slept under an ITN the night before the survey, by state, Nigeria MIS 2021

	Children under age 5 in all households			Children under age 5 in households with at least one ITN[1]	
State	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of children	Percentage who slept under an ITN[1] last night	Number of children
North Central					
FCT-Abuja	48.2	42.3	196	76.0	109
Benue	57.6	57.6	327	76.8	246
Kogi	23.1	21.0	178	59.7	63
Kwara	46.7	44.2	203	58.5	153
Nasarawa	15.1	14.4	427	47.9	129
Niger	22.1	21.4	565	41.7	290
Plateau	30.8	29.5	314	78.0	119
North East					
Adamawa	78.1	78.1	274	83.5	256
Bauchi	56.1	52.7	716	67.3	561
Borno	41.7	38.3	367	75.2	187
Gombe	65.2	64.9	232	73.2	205
Taraba	41.9	38.1	289	56.1	196
Yobe	41.3	40.7	385	53.1	296
North West					
Jigawa	71.2	70.1	524	75.3	488
Kaduna	63.0	62.4	661	74.2	556
Kano	64.8	64.8	971	75.6	833
Katsina	48.1	48.1	1,139	71.9	762
Kebbi	46.2	43.0	629	57.9	467
Sokoto	42.3	40.0	457	55.0	332
Zamfara	46.2	46.1	238	67.0	163
South East					
Abia	21.9	21.9	163	63.3	56
Anambra	20.4	20.4	180	61.2	60
Ebonyi	53.9	53.9	340	68.2	269
Enugu	12.9	12.9	183	45.1	52
Imo	10.6	10.6	128	29.6	46
South South					
Akwa Ibom	19.5	19.5	302	43.4	135
Bayelsa	25.9	22.8	121	60.8	45
Cross River	38.7	38.7	205	59.8	133
Delta	28.1	28.1	350	44.7	220
Edo	17.4	17.4	126	52.4	42
Rivers	14.4	14.4	254	46.2	79
South West					
Ekiti	10.8	10.8	83	26.0	34
Lagos	14.0	9.2	391	27.9	129
Ogun	18.2	18.2	206	38.5	97
Ondo	25.7	24.9	121	63.3	48
Osun	35.1	35.1	176	54.5	113
Oyo	35.6	35.6	318	60.5	187
Total	42.3	41.2	12,742	64.3	8,159

Note: Table is based on children who stayed in the household the night before the interview.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.7.1 Use of mosquito nets by pregnant women: National

Percentage of pregnant women age 15–49 who slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among pregnant women age 15–49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Nigeria MIS 2021

	Among pregnant women age 15–49 in all households			Among pregnant women age 15–49 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
Residence					
Urban	45.8	44.1	357	67.7	233
Rural	52.2	51.7	963	75.1	662
Zone					
North Central	35.7	35.1	184	60.8	106
North East	65.2	65.0	247	84.2	191
North West	60.9	59.5	615	78.3	467
South East	27.4	27.4	73	(66.9)	30
South South	20.6	20.6	94	46.9	41
South West	23.2	22.8	106	40.9	59
Education					
No education[2]	53.3	52.9	614	74.2	437
Primary	58.6	56.8	175	79.7	125
Secondary	46.4	45.4	420	73.1	261
More than secondary	36.8	36.2	111	55.8	72
Wealth quintile					
Lowest	54.6	54.6	273	78.4	190
Second	55.0	54.6	308	77.3	218
Middle	58.0	57.0	298	77.3	219
Fourth	46.2	44.0	257	70.9	159
Highest	30.3	29.9	184	50.8	109
Total	50.4	49.6	1,320	73.2	895

Notes: Table is based on women who stayed in the household the night before the interview. Figures in parentheses are based on 25–49 unweighted cases.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).
[2] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 3.7.2 Use of mosquito nets by pregnant women: States

Percentage of pregnant women age 15–49 who slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN) the night before the survey, and among pregnant women age 15–49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, by state, Nigeria MIS 2021

	Among pregnant women age 15–49 in all households			Among pregnant women age 15–49 in households with at least one ITN[1]	
State	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
North Central					
FCT-Abuja	*	*	11	*	9
Benue	*	*	24	*	19
Kogi	*	*	16	*	8
Kwara	(42.8)	(42.8)	25	*	19
Nasarawa	(23.4)	(19.5)	27	*	12
Niger	(30.7)	(30.7)	53	(53.6)	31
Plateau	(26.6)	(26.6)	27	*	9
North East					
Adamawa	(72.8)	(72.8)	26	(86.1)	22
Bauchi	71.1	71.1	99	(89.8)	79
Borno	(56.6)	(55.3)	23	*	15
Gombe	*	*	12	*	10
Taraba	(52.1)	(52.1)	20	(58.4)	18
Yobe	59.3	59.3	67	(83.9)	47
North West					
Jigawa	(86.0)	(86.0)	57	(88.6)	56
Kaduna	60.8	60.8	95	72.5	79
Kano	76.9	76.9	99	93.0	82
Katsina	51.4	51.4	194	80.9	123
Kebbi	54.1	50.6	81	(66.1)	62
Sokoto	(45.3)	(40.1)	50	(56.9)	36
Zamfara	65.5	56.9	39	(74.8)	30
South East					
Abia	*	*	9	*	2
Anambra	(5.7)	(5.7)	19	*	4
Ebonyi	(66.5)	(66.5)	25	*	19
Enugu	*	*	8	*	2
Imo	*	*	12	*	3
South South					
Akwa Ibom	*	*	16	*	9
Bayelsa	(22.9)	(22.9)	12	*	5
Cross River	*	*	17	*	11
Delta	*	*	18	*	11
Edo	*	*	19	*	2
Rivers	(1.4)	(1.4)	12	*	3
South West					
Ekiti	*	*	5	*	1
Lagos	*	*	30	*	20
Ogun	*	*	12	*	8
Ondo	*	*	14	*	4
Osun	*	*	20	*	9
Oyo	*	*	24	*	16
Total	50.4	49.6	1,320	73.2	895

Notes: Table is based on women who stayed in the household the night before the interview. Figures in parentheses are based on 25–49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.8.1 Main reason mosquito net was not used the night before the survey: National

Among ITNs, non-ITNs, and all mosquito nets, percentage that were not used by anyone the night before the survey, and among mosquito nets that were not used by anyone the night before the survey, percent distribution by the main reason each net was not used, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of nets not used the night before the survey	Total number of mosquito nets	Main reason each net was not used the night before the survey													Total	Number of mosquito nets not used the night before the survey
			No mosquitoes	No malaria	Too hot	Don't like smell	Feel "closed in"	Net too old/torn	Net too dirty	Net not available last night (washing)	Usual users did not sleep here last night	Net not needed last night	Bed bugs	Other	Don't know		
								ITNs[1]									
Residence																	
Urban	28.4	5,314	16.1	0.9	19.6	2.1	2.4	9.3	2.7	3.7	5.1	20.1	0.3	14.0	3.7	100.0	1,510
Rural	22.7	12,780	18.9	0.8	14.7	0.8	0.9	10.5	3.0	2.8	8.8	25.8	0.0	10.7	2.2	100.0	2,900
Zone																	
North Central	21.5	2,306	22.2	0.7	22.1	0.4	0.3	9.9	3.4	2.9	6.8	16.2	0.0	13.2	2.0	100.0	495
North East	17.3	3,882	23.9	0.2	9.6	1.4	4.3	6.9	1.0	2.9	10.8	26.5	0.2	6.5	5.7	100.0	671
North West	15.8	7,212	19.2	0.6	6.4	0.4	0.1	16.0	5.8	5.5	11.0	27.1	0.1	7.1	0.8	100.0	1,140
South East	42.6	1,013	8.8	0.9	23.2	1.5	0.7	8.7	2.2	0.7	6.5	35.0	0.0	10.7	1.0	100.0	432
South South	43.8	1,518	15.8	0.8	27.6	0.2	1.1	10.9	2.4	0.6	4.7	17.7	0.1	14.3	3.9	100.0	665
South West	46.6	2,163	15.9	1.6	19.2	3.1	2.2	5.7	1.3	3.3	4.3	21.5	0.1	18.7	3.1	100.0	1,007
Wealth quintile																	
Lowest	14.9	3,595	20.3	0.8	7.2	0.1	0.7	17.4	4.6	2.1	10.0	30.1	0.0	4.9	1.9	100.0	537
Second	17.7	4,002	26.3	0.8	9.7	0.2	0.6	13.8	5.5	4.0	9.9	21.9	0.2	5.3	1.8	100.0	708
Middle	21.0	3,792	13.7	0.8	16.7	0.8	1.1	7.5	2.6	3.0	11.4	24.9	0.3	14.0	3.3	100.0	798
Fourth	29.6	3,491	15.1	0.9	18.8	2.3	0.9	8.3	2.5	3.7	6.1	25.5	0.0	12.8	3.2	100.0	1,032
Highest	41.5	3,216	17.4	0.8	21.7	1.7	2.9	8.1	1.3	2.8	4.2	20.4	0.1	15.9	2.8	100.0	1,335
Total	24.4	18,095	18.0	0.8	16.4	1.2	1.5	10.1	2.9	3.1	7.6	23.8	0.1	11.8	2.7	100.0	4,410
								NON-ITNs									
Total	30.4	614	14.5	0.0	9.6	0.3	2.4	8.4	4.2	0.8	4.2	28.1	0.0	18.7	8.9	100.0	187
								ALL MOSQUITO NETS									
Total	24.6	18,709	17.8	0.8	16.1	1.2	1.5	10.0	3.0	3.0	7.4	24.0	0.1	12.1	2.9	100.0	4,597

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.8.2 Main reason mosquito net was not used the night before the survey: States

Among ITNs, non-ITNs, and all mosquito nets, percentage that were not used by anyone the night before the survey, and among mosquito nets that were not used by anyone the night before the survey, percent distribution by the main reason each net was not used, by state, Nigeria MIS 2021

State	Percentage of nets not used the night before the survey	Total number of mosquito nets	Main reason each net was not used the night before the survey													Total	Number of mosquito nets not used the night before the survey
			No mosquitoes	No malaria	Too hot	Don't like smell	Feel "closed in"	Net too old/torn	Net too dirty	Net not available last night (washing)	Usual users did not sleep here last night	Net not needed last night	Bed bugs	Other	Don't know		
			ITNs[1]														
North Central																	
FCT-Abuja	17.7	159	(23.1)	(0.0)	(28.0)	(3.8)	(3.7)	(1.8)	(0.0)	(0.0)	(4.9)	(19.0)	(0.0)	(11.8)	(3.8)	(100.0)	28
Benue	12.8	648	1.1	0.0	17.7	0.0	0.0	3.4	2.5	0.0	17.5	41.2	0.0	16.6	0.0	100.0	83
Kogi	25.1	176	21.5	0.0	1.2	0.0	0.0	5.8	10.4	0.0	4.4	32.7	0.0	17.7	6.4	100.0	44
Kwara	30.9	370	31.2	0.7	20.0	0.7	0.5	3.4	1.8	0.0	0.0	18.1	0.0	22.3	1.5	100.0	114
Nasarawa	27.8	201	0.0	0.0	31.6	0.0	0.0	51.7	2.1	0.0	3.5	5.5	0.0	4.2	1.4	100.0	56
Niger	25.1	541	41.1	1.1	29.7	0.0	0.0	7.0	3.4	5.3	4.8	0.0	0.0	5.5	2.1	100.0	136
Plateau	16.0	210	(4.2)	(3.6)	(15.6)	(0.0)	(0.0)	(2.1)	(6.5)	(20.9)	(22.3)	(7.7)	(0.0)	(15.7)	(1.5)	(100.0)	34
North East																	
Adamawa	14.9	784	7.6	0.0	12.8	3.7	2.3	9.3	3.9	1.8	9.2	29.0	0.0	20.3	0.0	100.0	117
Bauchi	15.1	1,149	35.5	0.0	4.4	0.0	0.0	7.4	0.0	6.9	25.5	18.1	0.0	2.1	0.0	100.0	174
Borno	6.1	322	(16.7)	(0.0)	(0.0)	(0.0)	(0.0)	(60.0)	(0.0)	(0.0)	(0.0)	(7.5)	(0.0)	(0.0)	(15.9)	(100.0)	20
Gombe	20.6	629	3.6	0.8	21.2	3.1	2.5	2.5	0.0	0.0	0.0	50.4	0.0	0.6	15.2	100.0	130
Taraba	24.5	366	15.9	0.0	7.2	1.0	12.5	3.2	0.0	0.0	6.0	34.0	0.9	13.8	5.3	100.0	90
Yobe	22.2	633	48.0	0.0	5.4	0.3	8.3	3.5	1.5	4.0	8.6	10.5	0.4	1.9	7.5	100.0	141
North West																	
Jigawa	11.7	1,105	3.4	0.0	2.0	0.0	0.9	5.4	9.2	34.2	20.5	20.6	0.0	3.8	0.0	100.0	130
Kaduna	22.2	1,237	5.7	0.3	11.2	0.0	0.0	6.7	2.6	2.0	10.1	39.5	0.5	21.4	0.0	100.0	275
Kano	9.2	1,686	24.7	0.0	0.0	0.0	0.0	10.0	7.3	1.3	10.2	44.3	0.0	1.5	0.7	100.0	156
Katsina	10.2	1,486	5.1	0.0	6.2	0.0	0.0	41.3	11.4	3.1	9.7	20.2	0.0	3.1	0.0	100.0	151
Kebbi	25.2	768	19.1	0.9	12.3	2.1	0.0	22.4	7.7	2.2	7.7	19.4	0.0	3.7	2.6	100.0	194
Sokoto	35.2	588	49.8	0.9	2.6	0.0	0.0	16.8	1.0	0.9	9.6	16.2	0.0	0.5	1.6	100.0	207
Zamfara	8.4	342	41.7	8.1	5.1	0.0	0.0	2.3	6.3	0.0	19.5	9.9	0.0	7.3	0.0	100.0	29
South East																	
Abia	47.4	130	10.8	0.0	28.3	2.8	1.3	14.5	0.0	0.0	6.5	28.6	0.0	7.3	0.0	100.0	62
Anambra	35.8	142	0.0	3.6	6.3	0.0	1.0	19.0	0.0	0.7	17.9	47.3	0.0	0.0	4.2	100.0	51
Ebonyi	34.0	501	11.5	0.3	18.0	2.2	0.3	3.2	2.7	1.0	3.8	44.7	0.0	11.6	0.6	100.0	170
Enugu	46.6	104	16.1	2.3	37.6	0.0	1.0	9.6	7.8	0.0	8.4	14.2	0.0	1.0	1.9	100.0	48
Imo	73.5	137	3.9	0.5	30.6	0.9	0.7	8.9	1.1	1.1	4.5	26.4	0.0	21.2	0.3	100.0	101
South South																	
Akwa Ibom	46.7	467	15.2	1.3	39.2	0.0	1.5	2.5	0.0	0.0	11.0	13.1	0.0	14.7	1.4	100.0	218
Bayelsa	29.2	71	(18.6)	(0.0)	(13.6)	(0.0)	(0.0)	(13.6)	(0.0)	(0.0)	(5.9)	(26.0)	(0.0)	(11.0)	(11.4)	(100.0)	21
Cross River	32.6	274	10.0	1.8	13.8	0.0	1.1	12.0	5.7	0.9	3.6	9.1	0.0	28.0	13.8	100.0	89
Delta	46.2	389	28.9	0.4	32.7	0.0	0.4	8.6	2.2	1.8	0.0	14.3	0.4	9.4	1.0	100.0	180
Edo	52.3	181	4.8	0.0	18.9	1.4	1.5	4.1	7.2	0.0	2.7	37.9	0.0	15.8	5.7	100.0	95
Rivers	46.0	136	3.9	0.0	10.1	0.0	1.2	54.6	0.0	0.5	0.0	22.2	0.0	6.4	1.1	100.0	63

(continued…)

Table 3.8.2—*Continued*

State	Percentage of nets not used the night before the survey	Total number of mosquito nets	Main reason each net was not used the night before the survey													Total	Number of mosquito nets not used the night before the survey
			No mosquitoes	No malaria	Too hot	Don't like smell	Feel "closed in"	Net too old/torn	Net too dirty	Net not available last night (washing)	Usual users did not sleep here last night	Net not needed last night	Bed bugs	Other	Don't know		
South West																	
Ekiti	46.5	61	26.1	0.0	15.4	0.0	14.4	22.8	2.1	1.5	4.1	8.6	0.0	5.0	0.0	100.0	28
Lagos	61.3	403	6.1	0.0	21.5	0.0	1.9	14.2	0.9	0.0	2.2	13.5	0.0	35.0	4.8	100.0	247
Ogun	34.5	281	61.6	8.3	8.7	5.8	0.6	0.0	0.0	0.0	0.0	10.7	0.0	3.2	1.2	100.0	97
Ondo	36.3	111	16.3	0.0	16.6	2.3	1.1	30.5	0.0	0.0	1.8	16.4	0.0	6.8	8.2	100.0	40
Osun	56.4	670	15.4	0.0	15.2	0.9	1.2	1.1	1.2	2.4	8.8	28.8	0.0	22.4	2.7	100.0	378
Oyo	34.1	637	6.2	3.7	29.0	9.7	3.8	0.0	2.8	11.1	1.2	25.3	0.5	4.6	2.1	100.0	217
NON-ITNs																	
Total	24.4	18,095	18.0	0.8	16.4	1.2	1.5	10.1	2.9	3.1	7.6	23.8	0.1	11.8	2.7	100.0	4,410
ALL MOSQUITO NETS																	
Total	24.6	18,709	17.8	0.8	16.1	1.2	1.5	10.0	3.0	3.0	7.4	24.0	0.1	12.1	2.9	100.0	4,597

Note: Figures in parentheses are based on 25-49 unweighted cases.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2008 NDHS, 2010 NMIS, 2013 NDHS, and 2015 NMIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.9.1 Antenatal care: National

Percent distribution of women age 15–49 who had a live birth in the 2 years preceding the survey by antenatal care (ANC) provider during the pregnancy for the most recent live birth and percentage receiving antenatal care from a skilled provider for the most recent live birth, according to background characteristics, Nigeria MIS 2021

Background characteristic	Antenatal care provider							No ANC	Total	Percentage receiving antenatal care from a skilled provider[1]	Number of women
	Doctor	Nurse/ midwife	Auxiliary midwife	Community extension health worker	Traditional birth attendant	Community health worker/ fieldworker	Other				
Age at birth											
<20	17.0	30.3	0.4	12.3	0.5	4.1	0.1	35.2	100.0	47.7	592
20–34	32.2	32.6	1.4	9.3	1.0	2.3	0.3	20.9	100.0	66.2	2,870
35–49	32.7	29.3	0.8	6.8	0.9	3.3	0.4	25.9	100.0	62.8	624
Birth order											
1	34.6	31.4	0.6	10.4	0.8	2.9	0.2	19.2	100.0	66.5	773
2–3	34.1	30.3	1.0	8.4	1.0	2.0	0.1	23.3	100.0	65.3	1,435
4–5	30.6	33.2	1.3	8.8	0.9	2.6	0.6	21.9	100.0	65.1	975
6+	19.3	33.0	1.6	10.6	1.1	3.8	0.3	30.2	100.0	53.9	903
Residence											
Urban	46.5	33.5	0.7	5.4	1.5	1.9	0.4	10.2	100.0	80.7	1,162
Rural	23.6	31.1	1.3	10.9	0.7	3.0	0.2	29.1	100.0	56.0	2,924
Zone											
North Central	38.8	23.7	1.6	10.1	0.4	1.5	0.3	23.6	100.0	64.2	716
North East	21.5	39.0	1.1	8.3	0.8	5.8	0.4	23.1	100.0	61.6	690
North West	15.6	29.5	0.7	15.4	0.6	3.6	0.0	34.5	100.0	45.8	1,528
South East	39.9	51.9	1.7	2.4	0.5	0.9	0.1	2.8	100.0	93.4	284
South South	45.8	33.9	0.6	0.4	1.2	0.1	0.4	17.6	100.0	80.2	403
South West	57.4	26.7	2.2	2.0	3.1	0.4	0.7	7.4	100.0	86.3	465
Education											
No education[2]	14.1	25.9	1.2	12.2	0.8	4.6	0.2	41.0	100.0	41.2	1,825
Primary	26.0	39.1	1.3	11.9	1.0	1.6	0.4	18.5	100.0	66.5	624
Secondary	44.0	38.3	1.0	6.2	1.5	1.1	0.3	7.6	100.0	83.3	1,229
More than secondary	66.0	27.0	1.0	2.2	0.0	0.5	0.1	3.1	100.0	94.0	408
Wealth quintile											
Lowest	9.2	26.1	1.3	12.4	1.3	4.1	0.2	45.3	100.0	36.6	840
Second	16.1	29.7	1.3	13.4	0.4	4.4	0.3	34.5	100.0	47.0	906
Middle	26.7	35.0	1.3	10.8	0.6	3.2	0.2	22.2	100.0	63.0	836
Fourth	39.2	41.6	0.9	6.6	1.4	1.3	0.4	8.6	100.0	81.7	734
Highest	64.3	27.6	0.8	2.4	1.2	0.0	0.2	3.5	100.0	92.7	770
Total	30.1	31.8	1.1	9.4	0.9	2.7	0.3	23.7	100.0	63.0	4,087

Notes: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.
[1] Skilled provider includes doctor, nurse/midwife, or auxiliary midwife.
[2] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 3.9.2 Antenatal care: States

Percent distribution of women age 15–49 who had a live birth in the 2 years preceding the survey by antenatal care (ANC) provider during the pregnancy for the most recent live birth and percentage receiving antenatal care from a skilled provider for the most recent live birth, by state, Nigeria MIS 2021

State	Antenatal care provider							No ANC	Total	Percentage receiving antenatal care from a skilled provider[1]	Number of women
	Doctor	Nurse/ midwife	Auxiliary midwife	Community extension health worker	Traditional birth attendant	Community health worker/ fieldworker	Other				
North Central											
FCT-Abuja	71.0	22.6	0.0	0.0	0.0	0.0	0.0	6.4	100.0	93.6	66
Benue	28.3	24.2	0.0	25.6	1.9	0.0	0.9	19.1	100.0	52.6	120
Kogi	41.8	38.4	0.0	1.3	0.0	2.6	0.0	15.9	100.0	80.2	51
Kwara	41.4	36.3	3.7	2.6	0.0	0.0	0.0	16.1	100.0	81.4	77
Nasarawa	48.3	13.2	0.0	13.3	0.0	0.0	1.1	24.2	100.0	61.4	123
Niger	29.6	16.1	4.7	9.7	0.4	4.6	0.0	34.8	100.0	50.5	187
Plateau	31.7	34.6	0.0	4.6	0.0	0.5	0.0	28.6	100.0	66.4	92
North East											
Adamawa	18.5	23.6	0.0	25.9	0.9	15.0	0.0	16.1	100.0	42.1	96
Bauchi	13.4	51.4	2.4	1.5	0.0	0.0	0.0	31.2	100.0	67.2	255
Borno	28.6	52.2	0.0	1.9	2.3	8.3	0.0	6.7	100.0	80.8	88
Gombe	28.5	27.2	2.4	12.1	4.1	5.7	0.0	19.9	100.0	58.2	66
Taraba	39.6	29.2	0.0	2.3	0.0	2.4	3.0	23.6	100.0	68.7	76
Yobe	20.1	26.8	0.0	15.9	0.0	11.4	0.4	25.4	100.0	46.8	107
North West											
Jigawa	17.9	27.8	0.5	28.5	0.0	4.9	0.0	20.4	100.0	46.2	160
Kaduna	31.6	43.7	0.0	7.4	0.0	4.3	0.0	13.0	100.0	75.3	227
Kano	16.8	31.2	0.9	29.4	2.8	2.0	0.0	17.1	100.0	48.8	296
Katsina	0.4	27.9	0.0	14.1	0.0	3.3	0.0	54.3	100.0	28.3	373
Kebbi	15.9	30.8	1.3	4.5	0.0	0.4	0.0	47.2	100.0	48.0	234
Sokoto	22.6	16.7	0.0	11.8	0.6	12.1	0.0	36.2	100.0	39.2	156
Zamfara	18.0	16.2	4.4	5.4	0.5	0.3	0.4	54.8	100.0	38.6	83
South East											
Abia	47.4	36.7	0.7	5.9	0.0	2.7	0.7	5.9	100.0	84.9	56
Anambra	53.1	37.8	4.5	1.7	1.4	0.0	0.0	1.5	100.0	95.4	53
Ebonyi	23.2	70.8	1.5	2.8	0.0	0.0	0.0	1.8	100.0	95.4	91
Enugu	49.2	50.1	0.0	0.0	0.0	0.0	0.0	0.7	100.0	99.3	46
Imo	38.8	50.6	1.5	0.0	1.5	2.7	0.0	4.8	100.0	90.9	38
South South											
Akwa Ibom	33.3	39.0	0.0	0.0	3.5	0.0	0.0	24.2	100.0	72.3	105
Bayelsa	36.1	15.4	0.0	1.9	0.0	0.0	0.0	46.6	100.0	51.5	29
Cross River	37.3	44.7	0.0	1.3	0.0	0.9	2.6	13.2	100.0	82.0	68
Delta	61.8	24.7	0.5	0.0	0.0	0.0	0.0	13.0	100.0	87.0	82
Edo	52.7	35.3	1.3	0.0	0.0	0.0	0.0	10.7	100.0	89.3	53
Rivers	52.8	32.6	2.1	0.0	1.7	0.0	0.0	10.8	100.0	87.5	66
South West											
Ekiti	61.1	10.3	4.0	3.8	5.9	1.7	6.5	6.8	100.0	75.3	25
Lagos	65.4	24.5	1.5	0.0	5.6	0.0	0.0	2.9	100.0	91.5	147
Ogun	51.8	31.7	1.5	0.9	5.5	1.5	0.0	7.0	100.0	85.1	73
Ondo	33.0	41.2	4.2	4.5	2.3	0.0	0.0	14.8	100.0	78.4	33
Osun	60.1	28.5	1.5	5.8	0.0	0.6	0.0	3.5	100.0	90.2	64
Oyo	55.6	24.8	2.7	2.1	0.0	0.0	1.5	13.3	100.0	83.1	123
Total	30.1	31.8	1.1	9.4	0.9	2.7	0.3	23.7	100.0	63.0	4,087

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.
[1] Skilled provider includes doctor, nurse/midwife, or auxiliary midwife.

Table 3.10.1 Number of antenatal care visits and timing of first visit: National

Percent distribution of women age 15–49 who had a live birth in the 2 years preceding the survey by number of antenatal care (ANC) visits during the pregnancy for the most recent live birth and by the timing of the first visit, and among women with ANC, median months pregnant at first visit, according to background characteristics, Nigeria MIS 2021

Background characteristic	Number of ANC visits									Number of months pregnant at time of first ANC visit							Median months pregnant at first visit (for those with ANC)	Number of women with ANC
	None	1	2	3	4–7	8+	Don't know	Total	4+ ANC visits	No ante-natal care	<4	4–7	7+	Don't know	Total	Number of women		
Age at birth																		
<20	35.2	6.2	7.3	12.1	32.5	4.4	2.3	100.0	36.9	35.2	22.2	32.9	8.8	0.9	100.0	592	4.9	384
20–34	20.9	3.6	5.0	11.0	41.4	13.3	4.9	100.0	54.7	20.9	27.5	43.5	7.0	1.1	100.0	2,870	4.6	2,271
35–49	25.9	3.4	6.6	7.6	37.6	13.0	5.8	100.0	50.6	25.9	21.7	44.5	6.1	1.8	100.0	624	4.7	462
Birth order																		
1	19.2	4.3	4.8	10.0	40.1	14.7	6.9	100.0	54.8	19.2	31.8	41.0	6.6	1.3	100.0	773	4.5	625
2–3	23.3	3.3	4.6	10.0	40.6	13.5	4.7	100.0	54.1	23.3	26.7	42.8	5.8	1.5	100.0	1,435	4.6	1,101
4–5	21.9	5.1	6.4	11.5	38.5	11.2	5.2	100.0	49.8	21.9	24.3	46.3	6.7	0.7	100.0	975	4.7	762
6+	30.2	3.4	6.8	11.3	38.3	7.9	2.1	100.0	46.2	30.2	21.0	37.4	10.3	1.2	100.0	903	4.9	630
Residence																		
Urban	10.2	3.0	4.8	10.1	46.8	16.5	8.6	100.0	63.3	10.2	31.1	51.0	6.3	1.5	100.0	1,162	4.5	1,044
Rural	29.1	4.3	5.9	10.8	36.6	10.1	3.1	100.0	46.8	29.1	23.8	38.5	7.5	1.1	100.0	2,924	4.7	2,073
Zone																		
North Central	23.6	3.5	5.1	9.2	42.6	11.4	4.6	100.0	54.0	23.6	30.9	38.7	5.2	1.6	100.0	716	4.4	548
North East	23.1	6.0	8.3	16.3	41.7	3.9	0.7	100.0	45.6	23.1	26.5	40.0	10.0	0.4	100.0	690	4.7	530
North West	34.5	4.0	5.6	10.8	39.3	4.2	1.6	100.0	43.5	34.5	17.3	39.4	8.0	0.8	100.0	1,528	5.0	1,001
South East	2.8	1.6	4.9	8.1	52.5	27.8	2.4	100.0	80.3	2.8	34.8	55.3	7.0	0.1	100.0	284	4.6	276
South South	17.6	2.4	2.5	9.7	34.2	21.8	11.9	100.0	55.9	17.6	26.3	47.5	6.5	2.0	100.0	403	4.8	332
South West	7.4	4.1	5.3	6.4	29.1	32.1	15.6	100.0	61.2	7.4	39.1	46.5	3.8	3.1	100.0	465	4.2	431
Education																		
No education[1]	41.0	5.2	6.3	11.6	30.0	4.4	1.6	100.0	34.4	41.0	18.5	31.3	7.8	1.3	100.0	1,825	4.8	1,077
Primary	18.5	2.3	6.5	12.0	48.3	9.7	2.6	100.0	58.0	18.5	27.1	43.8	9.6	1.0	100.0	624	4.8	509
Secondary	7.6	2.9	5.0	10.0	48.4	18.0	8.0	100.0	66.5	7.6	31.1	54.3	6.0	1.0	100.0	1,229	4.6	1,136
More than secondary	3.1	3.9	2.6	6.3	41.7	31.0	11.4	100.0	72.7	3.1	40.4	50.7	4.0	1.7	100.0	408	4.3	396
Wealth quintile																		
Lowest	45.3	5.2	7.3	13.0	26.4	1.4	1.4	100.0	27.8	45.3	14.7	29.4	9.0	1.6	100.0	840	5.0	459
Second	34.5	5.8	7.0	11.2	34.9	5.3	1.3	100.0	40.2	34.5	22.5	34.8	7.3	0.9	100.0	906	4.7	593
Middle	22.2	3.0	5.2	11.4	45.5	9.8	2.9	100.0	55.3	22.2	24.9	43.5	8.7	0.7	100.0	836	4.8	650
Fourth	8.6	2.6	4.2	11.5	51.7	15.8	5.5	100.0	67.5	8.6	31.1	53.1	5.5	1.7	100.0	734	4.7	671
Highest	3.5	2.6	3.8	5.8	41.2	29.9	13.2	100.0	71.1	3.5	38.0	52.3	4.9	1.3	100.0	770	4.4	743
Total	23.7	3.9	5.6	10.6	39.5	11.9	4.6	100.0	51.5	23.7	25.8	42.1	7.1	1.2	100.0	4,087	4.7	3,117

[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 3.10.2 Number of antenatal care visits and timing of first visit: States

Percent distribution of women age 15–49 who had a live birth in the 2 years preceding the survey by number of antenatal care (ANC) visits during the pregnancy for the most recent live birth and by the timing of the first visit, and among women with ANC, median months pregnant at first visit, by state, Nigeria MIS 2021

	Number of ANC visits									Number of months pregnant at time of first ANC visit							Median months pregnant at first visit (for those with ANC)	Number of women with ANC
State	None	1	2	3	4–7	8+	Don't know	Total	4+ ANC visits	No ante-natal care	<4	4–7	7+	Don't know	Total	Number of women		
North Central																		
FCT-Abuja	6.4	0.0	0.0	6.6	44.9	10.1	31.9	100.0	55.1	6.4	34.9	53.7	2.3	2.8	100.0	66	4.4	62
Benue	19.1	6.6	6.3	12.8	50.7	4.5	0.0	100.0	55.2	19.1	45.9	32.4	2.6	0.0	100.0	120	3.7	97
Kogi	15.9	8.0	4.0	8.7	37.8	22.5	3.2	100.0	60.3	15.9	44.2	32.2	5.4	2.4	100.0	51	3.9	43
Kwara	16.1	1.2	3.6	4.8	45.4	26.4	2.6	100.0	71.8	16.1	38.6	39.9	5.4	0.0	100.0	77	4.1	65
Nasarawa	24.2	0.6	3.6	9.5	54.8	5.5	1.7	100.0	60.3	24.2	28.0	44.0	2.2	1.6	100.0	123	4.4	93
Niger	34.8	5.6	8.4	11.3	29.3	7.3	3.2	100.0	36.7	34.8	21.8	33.6	7.1	2.7	100.0	187	5.0	122
Plateau	28.6	1.3	4.4	5.7	41.5	18.5	0.0	100.0	60.0	28.6	17.0	42.1	11.0	1.4	100.0	92	5.0	66
North East																		
Adamawa	16.1	4.3	9.0	19.2	49.5	1.9	0.0	100.0	51.4	16.1	22.2	51.0	10.8	0.0	100.0	96	4.7	81
Bauchi	31.2	4.8	10.7	14.8	29.6	8.7	0.3	100.0	38.2	31.2	13.5	40.0	15.3	0.0	100.0	255	5.4	176
Borno	6.7	5.4	5.5	23.5	56.5	0.9	1.6	100.0	57.4	6.7	45.7	40.6	5.6	1.4	100.0	88	4.0	82
Gombe	19.9	10.1	9.3	21.5	35.1	0.0	4.1	100.0	35.1	19.9	32.5	38.4	7.1	2.1	100.0	66	4.5	53
Taraba	23.6	3.7	7.0	10.9	51.7	3.0	0.0	100.0	54.7	23.6	30.9	36.2	9.3	0.0	100.0	76	4.4	58
Yobe	25.4	9.6	4.5	12.0	48.0	0.0	0.4	100.0	48.0	25.4	38.7	33.1	2.5	0.4	100.0	107	3.9	80
North West																		
Jigawa	20.4	3.3	8.2	22.2	41.6	3.8	0.5	100.0	45.4	20.4	26.1	43.7	9.7	0.0	100.0	160	4.8	127
Kaduna	13.0	1.9	6.5	8.7	55.3	11.1	3.5	100.0	66.4	13.0	24.0	57.1	5.0	0.9	100.0	227	4.9	197
Kano	17.1	7.3	9.8	12.8	51.0	0.0	2.0	100.0	51.0	17.1	14.3	56.2	11.7	0.7	100.0	296	5.3	245
Katsina	54.3	2.0	1.7	9.8	31.5	0.7	0.0	100.0	32.2	54.3	11.2	30.2	4.3	0.0	100.0	373	5.0	170
Kebbi	47.2	6.9	5.3	8.0	26.3	5.2	1.1	100.0	31.5	47.2	24.2	17.4	9.2	2.0	100.0	234	4.2	124
Sokoto	36.2	3.3	2.5	4.3	38.1	10.9	4.8	100.0	48.9	36.2	15.0	36.6	10.8	1.4	100.0	156	4.9	100
Zamfara	54.8	1.8	7.5	11.7	23.0	1.3	0.0	100.0	24.3	54.8	5.4	31.7	6.8	1.3	100.0	83	5.5	37
South East																		
Abia	5.9	0.0	0.0	1.2	61.8	27.8	3.3	100.0	89.6	5.9	38.2	49.3	6.7	0.0	100.0	56	4.4	53
Anambra	1.5	0.0	6.6	5.2	59.5	27.2	0.0	100.0	86.7	1.5	56.7	39.7	2.1	0.0	100.0	53	3.7	53
Ebonyi	1.8	3.3	4.6	9.0	50.5	30.3	0.6	100.0	80.8	1.8	17.4	69.3	11.5	0.0	100.0	91	5.4	90
Enugu	0.7	2.1	8.1	17.7	52.9	18.6	0.0	100.0	71.5	0.7	40.9	56.9	1.5	0.0	100.0	46	4.3	46
Imo	4.8	1.4	6.3	8.6	33.3	33.7	11.8	100.0	67.1	4.8	33.6	50.2	10.4	1.0	100.0	38	4.8	36
South South																		
Akwa Ibom	24.2	4.0	2.6	13.2	44.2	7.8	4.1	100.0	52.0	24.2	6.0	53.8	16.0	0.0	100.0	105	6.2	79
Bayelsa	46.6	0.0	1.6	4.9	9.2	29.4	8.4	100.0	(38.6)	46.6	23.0	23.4	3.9	3.1	100.0	29	4.2	15
Cross River	13.2	6.2	8.4	15.9	46.8	7.0	2.5	100.0	53.8	13.2	32.3	42.5	9.0	3.0	100.0	68	4.5	59
Delta	13.0	1.2	0.7	13.0	32.0	17.2	22.9	100.0	49.2	13.0	42.2	42.1	0.6	2.2	100.0	82	4.0	71
Edo	10.7	0.0	0.0	1.0	29.7	44.1	14.5	100.0	(73.8)	10.7	24.4	58.1	1.7	5.2	100.0	53	4.7	48
Rivers	10.8	0.2	0.9	2.4	22.3	43.6	19.9	100.0	65.9	10.8	35.5	51.5	1.2	1.0	100.0	66	4.3	59
South West																		
Ekiti	6.8	0.0	3.2	2.3	43.1	44.6	0.0	100.0	87.7	6.8	29.3	61.8	2.1	0.0	100.0	25	4.5	23
Lagos	2.9	0.0	1.7	4.1	14.9	44.7	31.7	100.0	59.6	2.9	51.3	40.1	4.5	1.2	100.0	147	3.9	142
Ogun	7.0	0.8	6.5	13.2	15.5	49.4	7.6	100.0	64.9	7.0	51.8	31.5	1.2	8.4	100.0	73	3.8	68
Ondo	14.8	0.0	0.0	16.6	49.3	8.7	10.6	100.0	58.0	14.8	23.2	53.8	2.1	6.2	100.0	33	4.8	28
Osun	3.5	0.8	2.4	3.5	26.6	46.4	16.9	100.0	73.0	3.5	44.0	47.6	5.0	0.0	100.0	64	4.5	62
Oyo	13.3	14.8	12.3	4.7	47.0	3.0	4.8	100.0	50.0	13.3	20.9	57.3	4.8	3.7	100.0	123	4.6	107
Total	23.7	3.9	5.6	10.6	39.5	11.9	4.6	100.0	51.5	23.7	25.8	42.1	7.1	1.2	100.0	4,087	4.7	3,117

Note: Figures in parentheses are based on 25–49 unweighted cases.

Table 3.11.1 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 that resulted in the last live birth, received one or more doses of SP/Fansidar, received two or more doses of SP/Fansidar, and received three or more doses of SP/Fansidar, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage who received one or more doses of SP/Fansidar	Percentage who received two or more doses of SP/Fansidar	Percentage who received three or more doses of SP/Fansidar	Number of women with a live birth in the 2 years preceding the survey
Birth order				
1	62.5	50.9	35.6	773
2–3	59.0	45.3	31.3	1,435
4–5	59.4	47.3	29.3	975
6+	55.1	41.2	28.4	903
Residence				
Urban	72.1	57.5	38.6	1,162
Rural	53.6	41.3	28.0	2,924
Zone				
North Central	57.0	48.1	35.5	716
North East	54.5	40.2	27.3	690
North West	56.5	40.8	30.1	1,528
South East	80.5	72.7	41.2	284
South South	61.0	49.0	29.3	403
South West	61.1	48.8	27.9	465
Education				
No education[1]	45.0	33.6	23.5	1,825
Primary	65.2	52.5	34.2	624
Secondary	69.7	54.1	36.5	1,229
More than secondary	78.9	66.2	43.2	408
Wealth quintile				
Lowest	40.5	30.1	19.5	840
Second	48.8	34.8	25.5	906
Middle	61.7	50.2	34.2	836
Fourth	70.2	55.1	38.2	734
Highest	77.0	62.9	39.7	770
Total	58.9	45.9	31.0	4,087

[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 3.11.2 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 that resulted in the last live birth, received one or more doses of SP/Fansidar, received two or more doses of SP/Fansidar, and received three or more doses of SP/Fansidar, by state, Nigeria MIS 2021

State	Percentage who received one or more doses of SP/Fansidar	Percentage who received two or more doses of SP/Fansidar	Percentage who received three or more doses of SP/Fansidar	Number of women with a live birth in the 2 years preceding the survey
North Central				
FCT-Abuja	67.4	59.3	35.9	66
Benue	66.2	59.1	47.7	120
Kogi	54.3	46.7	25.7	51
Kwara	59.2	43.1	27.4	77
Nasarawa	62.6	51.1	43.8	123
Niger	46.3	37.4	22.9	187
Plateau	51.4	48.8	45.8	92
North East				
Adamawa	77.5	53.9	41.9	96
Bauchi	40.3	29.1	18.8	255
Borno	78.7	61.3	41.5	88
Gombe	57.2	43.3	26.7	66
Taraba	63.0	46.8	25.2	76
Yobe	40.1	30.3	24.3	107
North West				
Jigawa	62.9	43.1	28.5	160
Kaduna	65.4	43.0	28.1	227
Kano	76.3	48.4	32.6	296
Katsina	41.8	37.0	30.2	373
Kebbi	44.5	35.8	31.4	234
Sokoto	61.6	43.0	29.2	156
Zamfara	40.0	30.6	27.3	83
South East				
Abia	85.3	82.7	51.1	56
Anambra	87.2	77.3	52.3	53
Ebonyi	92.3	82.1	42.9	91
Enugu	70.6	65.9	29.9	46
Imo	47.5	36.6	20.6	38
South South				
Akwa Ibom	43.4	30.0	6.9	105
Bayelsa	44.7	38.5	25.3	29
Cross River	77.7	62.3	48.7	68
Delta	60.2	49.9	38.2	82
Edo	61.7	56.3	26.2	53
Rivers	79.2	63.0	38.0	66
South West				
Ekiti	74.0	62.6	40.0	25
Lagos	69.1	58.7	30.7	147
Ogun	54.8	41.7	35.7	73
Ondo	60.0	50.1	28.2	33
Osun	55.7	44.8	25.2	64
Oyo	55.8	40.1	18.9	123
Total	58.9	45.9	31.0	4,087

MALARIA IN CHILDREN 4

Key Findings

- ***Malaria:*** 22% of children age 6–59 months tested positive for malaria according to microscopy.
- ***Malaria trends:*** The percentage of children age 6–59 months testing positive for malaria according to microscopy decreased from 42% in 2010 to 22% in 2021.
- ***Malaria prevalence by zone:*** 29% of children in North West were positive for malaria according to microscopy, as compared with 17% of children in North Central.
- ***Malaria prevalence by residence:*** 26% of children in rural areas were positive for malaria according to microscopy, compared with 11% of urban children.
- ***Fever:*** 37% of children under age 5 had a fever in the 2 weeks before the survey.
- ***Testing:*** 24% of children with a fever had blood taken from a finger or heel for testing.
- ***Artemisinin-based combination therapy (ACT):*** Among children under age 5 with a fever in the 2 weeks preceding the survey who took an antimalarial, 74% received ACT.

This chapter presents data useful for assessing how well fever management strategies are being implemented. Specific topics include care seeking for febrile children, diagnostic testing of children with fever, and therapeutic use of antimalarial drugs. The prevalence of anaemia and malaria among children age 6–59 months is also discussed.

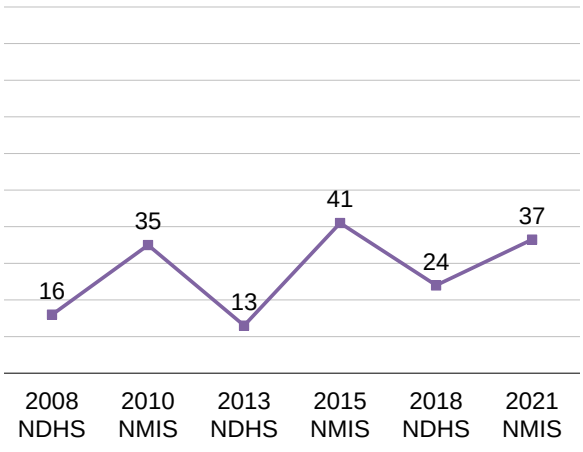
4.1 CHILDREN WITH FEVER

Fever is a key symptom of malaria and other acute infections in children and an important entry point into case management for malaria. Malaria fevers require prompt and effective treatment to prevent malaria morbidity and mortality. Thirty-seven percent of children under age 5 had a fever in the 2 weeks preceding the survey (**Table 4.1.1**).

Trends: The prevalence of fever among children under age 5 in the 2 weeks before the survey increased from 16% in 2008 to 41% in 2015 and then decreased to 37% in 2021 (**Figure 4.1**).

Figure 4.1 **Trends in recent fever among children under age 5**

Percentage of children under age 5 with a fever in the 2 weeks preceding the survey

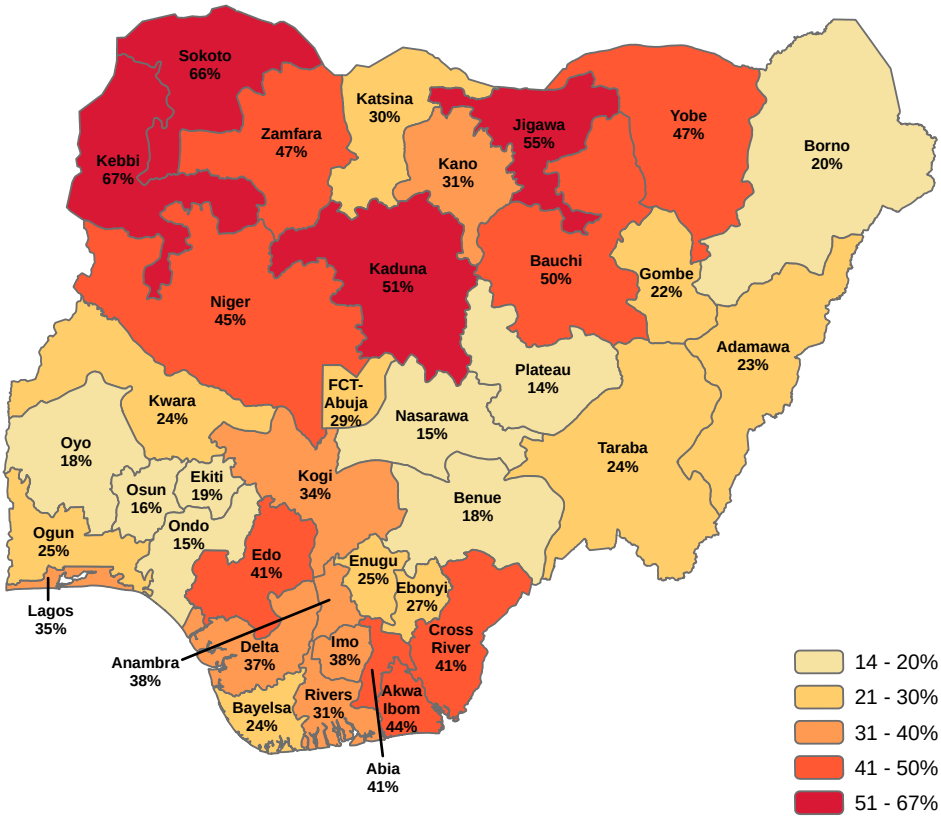


Patterns by background characteristics

- The prevalence of fever among children under age 5 is 39% in rural areas, as compared with 31% in urban areas (**Table 4.1.1**).
- By state, fever prevalence ranges from 14% in Plateau to 67% in Kebbi (**Table 4.1.2** and **Figure 4.2**).

Figure 4.2 **Children with fever, by state**

Percentage of children under 5 with a fever in the 2 weeks preceding the survey



4.2 CARE SEEKING FOR FEVER IN CHILDREN

Care seeking for children under age 5 with a fever

Percentage of children under age 5 with a fever in the 2 weeks before the survey for whom advice or treatment was sought from the public sector, the private medical sector, the NGO medical sector, a chemist shop/patent and proprietary medicine vendor (PPMV), a market, or an itinerant drug seller.

Sample: Children under age 5 with a fever in the 2 weeks before the survey

The revised National Guidelines for the Diagnosis, Treatment, and Prevention of Malaria recommend prompt presentation of fever cases at health facilities. Advice or treatment was sought for 63% of children with a fever. Thirty-two percent of children with a recent fever received timely care (sought advice or treatment the same or next day) following fever onset (**Table 4.1.1**). Among children under age 5 with a fever in the 2 weeks preceding the survey for whom advice or treatment was sought, 18% were referred to a higher level of care (**Table 4.2**).

Among children with a recent fever for whom advice or treatment was sought, 45% received advice or treatment from the public health sector and 31% received advice or treatment from the private health

sector. Less than 1% received care from the nongovernmental organisation (NGO) private medical sector, and 25% received advice from other private sector sources. Among public sector facilities, the most common sources of advice or treatment were government hospitals (18%) and government health centres (14%). Among other private sector sources, the largest percentage of children received care at chemist shops/patent and proprietary medicine vendors (PPMVs) (23%) (**Table 4.3**).

Patterns by background characteristics

- The percentage of children for whom advice or treatment was sought ranges from 59% among those under age 12 months to 66% among those age 12–23 months (**Table 4.1.1**).
- The percentage of children for whom advice or treatment was sought the same or next day ranges from 23% among those whose mothers have no formal or informal education to 41% among those whose mothers have a secondary education.
- The percentage of children with a fever who were taken for advice or treatment and referred to a higher level of care ranges from 4% in South South to 25% in North East (**Table 4.2**).

4.3 Diagnostic Testing of Children with Fever

Diagnosis of malaria in children under age 5 with a fever

Percentage of children under age 5 with a fever in the 2 weeks before the survey who had blood taken from a finger or heel for testing. This is a proxy measure of diagnostic testing for malaria.

Sample: Children under age 5 with a fever in the 2 weeks before the survey

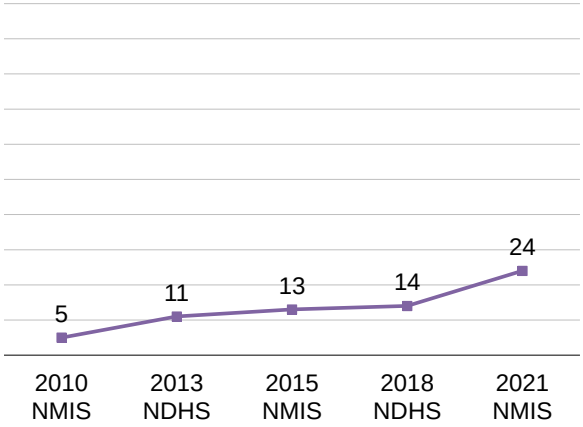
The national treatment policy for the management of malaria recommends confirmation of malaria by microscopy or rapid diagnostic testing for all persons with a fever prior to commencement of treatment (NMEP 2020a). Adherence to this policy cannot be directly measured through household surveys; however, the 2021 NMIS asked interviewed women with children under age 5 who had a fever in the 2 weeks before the survey if the child had blood taken from a finger or heel for testing during the illness. This information is used as a proxy measure for adherence to the NMEP policy of conducting diagnostic testing for all suspected malaria cases.

In the 2021 NMIS, 24% of children with a fever in the 2 weeks before the survey had blood taken from a finger or heel for testing, presumably for malaria testing (**Table 4.1.1**).

Trends: The percentage of children with a fever in the 2 weeks preceding the survey who had blood taken from a finger or heel for testing increased from 5% in 2010 to 24% in 2021 (**Figure 4.3**).

Figure 4.3 Trends in diagnostic testing of children with fever

Percentage of children under age 5 who had blood taken from a finger or heel for testing



Patterns by background characteristics

- By age, diagnosis of malaria by a health care provider is highest among children age 48–59 months (52%) (**Table 4.1.1**).
- The percentage of children who were reported to have had blood taken from a finger or heel for testing is similar among those residing in urban (23%) and rural (25%) areas.
- By zone, the percentage of children who had blood taken for testing ranges from 13% in South East to 28% in North East.
- The percentage of children who were reported to have had blood taken from a finger or heel for testing was highest in the lowest wealth quintile (29%).

4.4 USE OF RECOMMENDED ANTIMALARIALS

Artemisinin-based combination therapy (ACT) for children under age 5 with a fever

Percentage of children under age 5 with a fever in the 2 weeks before the survey who received artemisinin-based combination therapy (ACT).

Sample: Children under age 5 with a fever in the 2 weeks before the survey who took any antimalaria drug

Artemisinin-based combination therapy (ACT) is the recommended first-line antimalarial drug for the treatment of uncomplicated malaria in Nigeria. Among children who took any antimalarial, 74% received ACT, 9% received chloroquine, 7% received artesunate injection, and 6% received sulfadoxine-pyrimethamine (SP)/Fansidar (**Table 4.4**).

In 90% of children under age 5 with a fever in the 2 weeks preceding the survey who received ACT, the fever went away after they received ACT (**Table 4.5**).

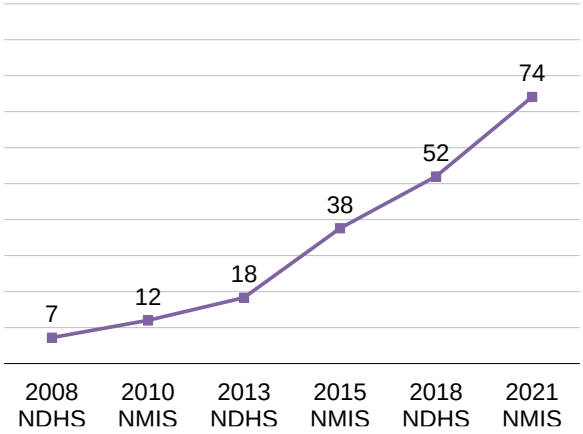
Trends: Among children under age 5 who took an antimalarial, there has been a sustained and remarkable increase in the percentage who received ACT, from 7% in 2008 to 74% in 2021 (**Figure 4.4**).

Patterns by background characteristics

- The percentage of children who received ACT is highest in North East (81%) and lowest in North West (58%) (**Table 4.4**).
- Children age 24–35 months (79%) had the highest percentage of ACT use.
- The percentage of children whose fever went away after they received ACT ranges from 80% in South South to 95% in South West (**Table 4.5**).

Figure 4.4 **Trends in ACT use among children under age 5**

Among children under age 5 with recent fever who took an antimalarial, percentage who received ACT



4.5 PREVALENCE OF LOW HAEMOGLOBIN LEVELS IN CHILDREN

Prevalence of low haemoglobin in children

Percentage of children age 6–59 months who had a haemoglobin measurement of less than 8 grams per decilitre (g/dl) of blood. The cutoff of 8 g/dl is often used to classify malaria-related anaemia.

Sample: Children age 6–59 months

Anaemia, defined as a reduced level of haemoglobin in the blood, decreases the amount of oxygen reaching the tissues and organs of the body and reduces their capacity to function. Anaemia is associated with impaired motor and cognitive development in children. The main causes of anaemia in children are malaria and inadequate intake of iron, folate, vitamin B12, and other nutrients. Other causes of anaemia include intestinal worms, haemoglobinopathy, and sickle cell disease. Although anaemia is not specific to malaria, trends in anaemia prevalence can reflect malaria morbidity, and they respond to changes in the coverage of malaria interventions (Korenromp et al. 2004). A haemoglobin level below 8.0 g/dl is classified as severe anaemia.

During the 2021 NMIS, consent was obtained and testing for anaemia was conducted among almost all (96%) eligible children age 6–59 months from the interviewed households (**Table 4.6.1**). Results detailed in **Table 4.7.1** show that the overall national percentage of children age 6–59 months classified as having low haemoglobin levels (<8.0 g/dl) is 8%.

Trends: The percentage of low haemoglobin among children age 6–59 months decreased from 13% in 2010 to 8% in 2021 (**Figure 4.5**).

Patterns by background characteristics

- Children age 12–17 months had the highest percentage (12%) of low haemoglobin (**Table 4.7.1**).
- A higher percentage of children in rural areas (9%) had low haemoglobin than children in urban areas (5%).
- By state, low haemoglobin ranges from 1% in Nasarawa, Imo, and Bayelsa to 22% in Sokoto (**Table 4.7.2** and **Figure 4.6**).

Figure 4.5 **Trends in low haemoglobin among children**

Percentage of children age 6–59 months with haemoglobin <8.0 g/dl

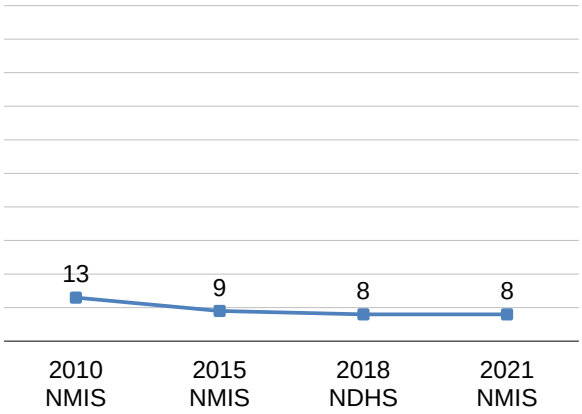
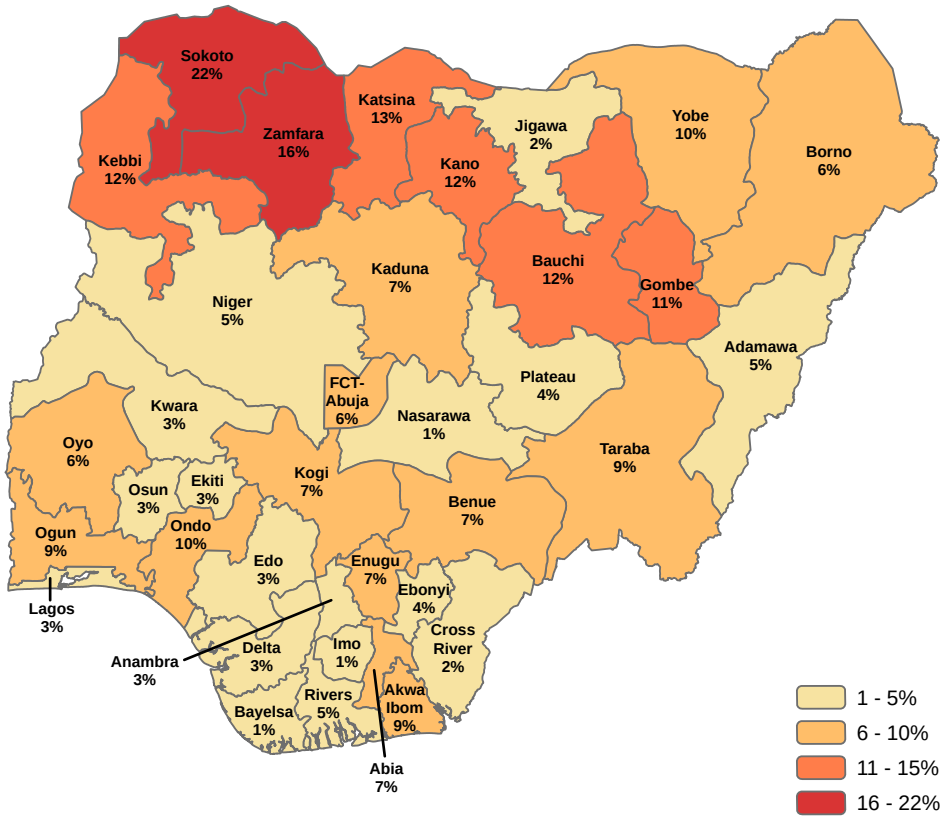


Figure 4.6 **Prevalence of low haemoglobin in children, by state**

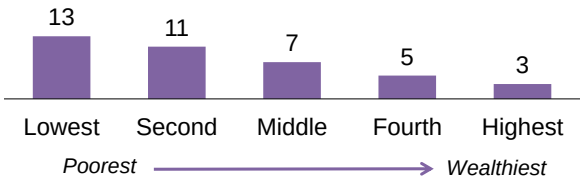
Percentage of children age 6–59 months with haemoglobin <8.0 g/dl



- The percentage of children with low haemoglobin decreases with increasing wealth, from 13% in the lowest wealth quintile to 3% in the highest wealth quintile (**Table 4.7.1** and **Figure 4.7**).

Figure 4.7 **Low haemoglobin in children, by household wealth**

Percentage of children age 6–59 months with haemoglobin <8.0 g/dl



4.6 PREVALENCE OF MALARIA IN CHILDREN

Malaria prevalence in children

Percentage of children age 6–59 months classified as infected with malaria according to microscopy results.

Sample: Children age 6–59 months

Malaria is endemic in Nigeria. Those living in areas of high malaria transmission acquire partial immunity to the disease over time. However, many people, including children, can have malaria parasites in their blood without showing any signs of infection. Such asymptomatic infections not only contribute to further transmission of malaria but also increase the risk of anaemia and other associated morbidity among infected individuals.

Figure 4.8 **Comparison of fieldwork data collection**

Survey	Dates of data collection
2010 NMIS	October–December 2010
2015 NMIS	October–November 2015
2018 NDHS	August–December 2018
2021 NMIS	October–December 2021

The 2021 NMIS was conducted in October through December 2021 at the peak of the malaria transmission season. Normally, a spike in malaria cases occurs during these months. Previous surveys that incorporated malaria testing included the 2010 NMIS, the 2015 NMIS, and the 2018 NDHS (see **Figure 4.8** for dates of data collection).

All children age 6–59 months were eligible for malaria testing. Among eligible children age 6–59 months from interviewed households, 96% were tested for malaria with a rapid diagnostic test (RDT) and 96% were tested by microscopy (**Table 4.6.1**). For details on malaria testing procedures, see Chapter 1.

In the 2021 NMIS, 22% of children age 6–59 months were positive for malaria parasites according to microscopy results. RDTs were performed in conjunction with microscopy to facilitate treatment of infected children during survey fieldwork. Forty percent of children age 6–59 months tested positive for malaria antigens using RDTs (**Table 4.8.1**).

Trends: The percentage of children age 6–59 months testing positive for malaria according to microscopy decreased from 42% in 2010 to 22% in 2021 (**Figure 4.9**).

Trends by background characteristics

- Between 2010 and 2021, malaria prevalence according to microscopy decreased in both urban areas (from 23% to 11%) and rural areas (from 48% to 27%) (**Figure 4.10**).

Figure 4.9 **Trends in malaria prevalence among children**

Percentage of children age 6–59 months who tested positive for malaria by microscopy

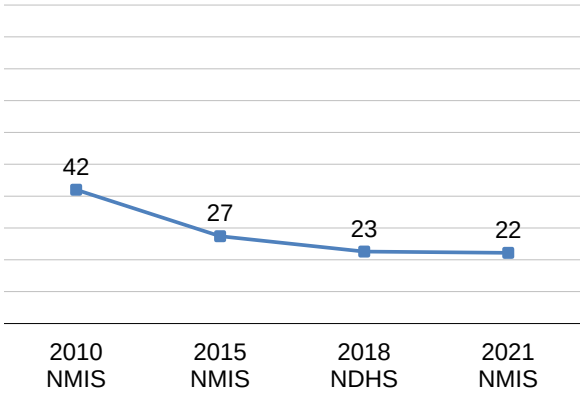
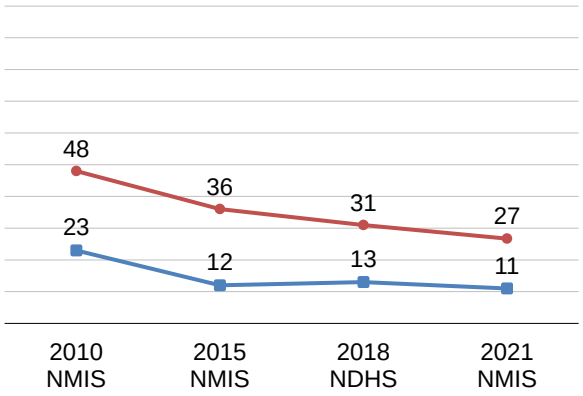


Figure 4.10 **Trends in malaria prevalence among children, by residence**

Percentage of children age 6–59 months who tested positive for malaria by microscopy



- Malaria prevalence decreased from 2010 to 2021 across all zones. The greatest decrease was seen in North Central, where malaria prevalence according to microscopy decreased from 49% to 17%. Compared to the 2015 NMIS, malaria prevalence decreased in North Central, North East, North West, and South South only (**Figure 4.11**).
- By wealth quintile, the greatest decrease in malaria prevalence according to microscopy was seen in the middle quintile (from 50% in 2010 to 23% in 2021) (**Figure 4.12**).

Figure 4.11 **Trends in malaria prevalence among children, by zone**

Percentage of children age 6–59 months who tested positive for malaria by microscopy

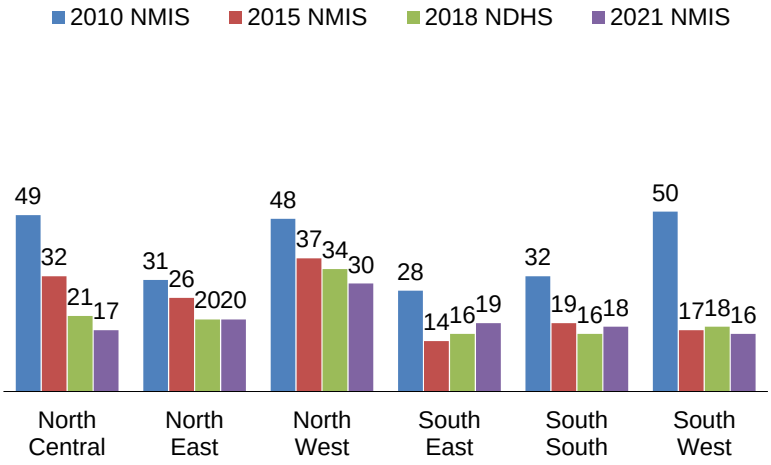
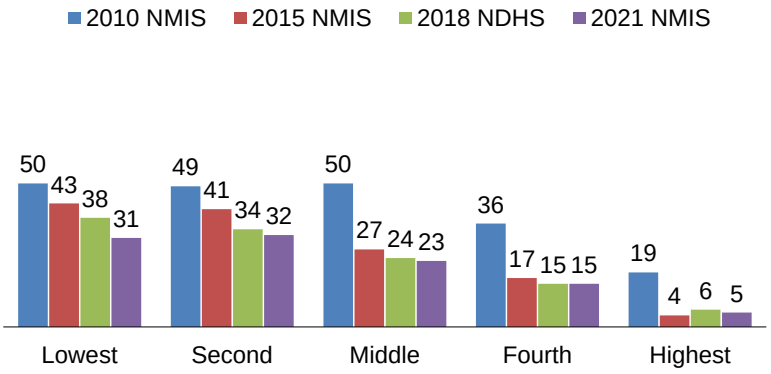


Figure 4.12 **Trends in malaria prevalence among children, by wealth quintile**

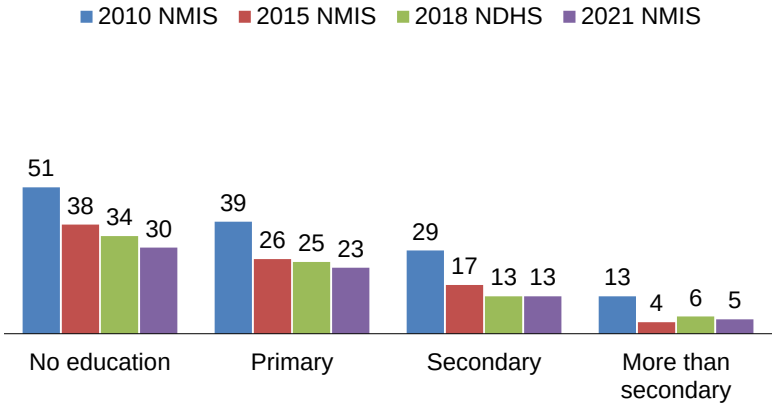
Percentage of children age 6–59 months who tested positive for malaria by microscopy



- By mother's education, malaria prevalence according to microscopy has generally decreased over time. The greatest percentage point decrease has been among children whose mothers have no education (from 51% in 2010 to 30% in 2021) (**Figure 4.13**).

Figure 4.13 Trends in malaria prevalence among children, by mother's education

Percentage of children age 6–59 months who tested positive for malaria by microscopy



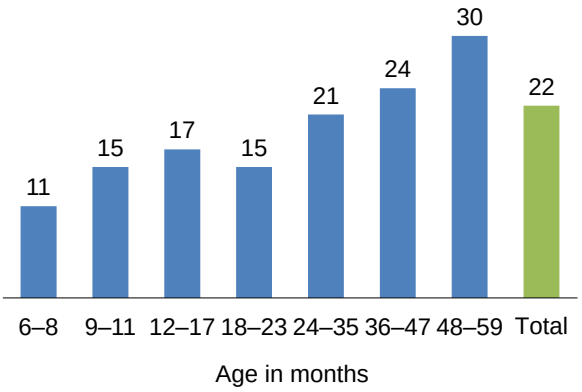
Patterns by background characteristics

- Malaria prevalence according to microscopy generally increases with age, from 11% among children age 6–8 months to 30% among those age 48–59 months (**Table 4.8.1** and **Figure 4.14**).

- By zone, the prevalence of malaria according to microscopy is highest in North West (30%) (**Table 4.8.1**).

Figure 4.14 Prevalence of malaria in children, by age

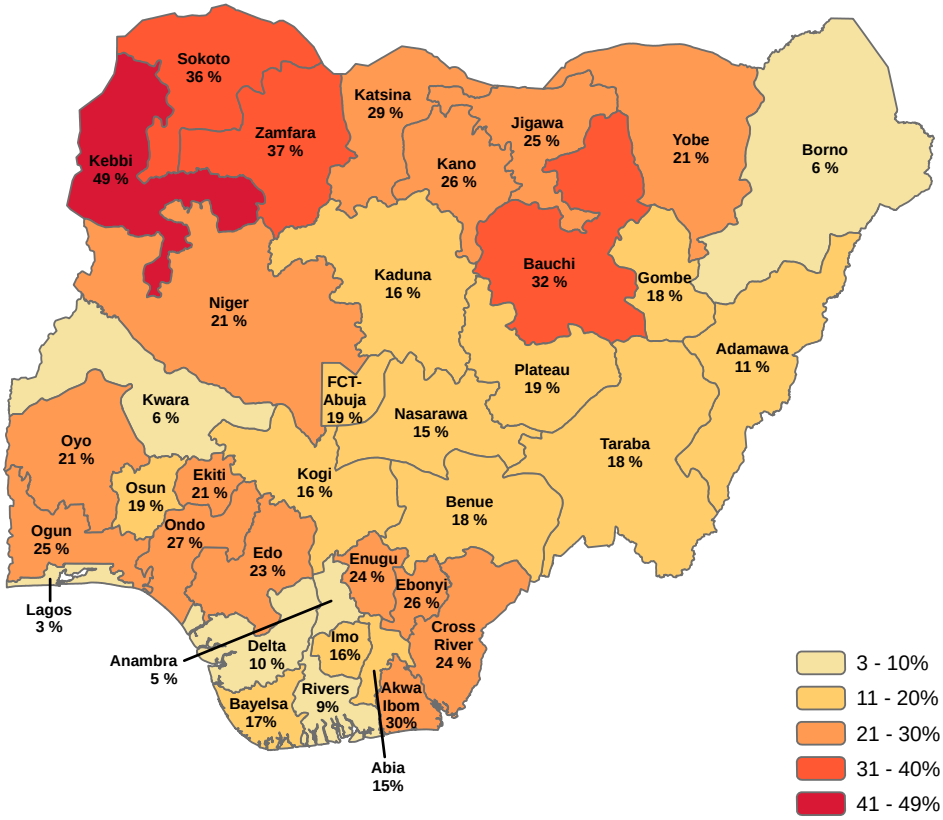
Percentage of children age 6–59 months who tested positive for malaria by microscopy



- The prevalence of malaria according to microscopy generally decreases with increasing household wealth, from 31% in the lowest and second wealth quintiles to 5% in the highest wealth quintile (**Table 4.8.1**).
- The prevalence of malaria in children according to microscopy is more than twice as high in rural areas (27%) as in urban areas (11%).
- By state, malaria prevalence ranges from 3% in Lagos to 49% in Kebbi (**Table 4.8.2** and **Figure 4.15**).

Figure 4.15 **Prevalence of malaria in children, by state**

Percentage of children age 6–59 months who tested positive for malaria by microscopy



4.7 MALARIA SPECIES

Several species of malaria parasites exist; *P. falciparum* malaria is the predominant species in Nigeria, causing the majority of illnesses among patients. It also causes the most severe form of the disease among children and leads to poor pregnancy outcomes in pregnant women. There are other important species including *P. malariae*, *P. ovale*, and *P. vivax*. The delineation of malaria species is important as it guides a country's malaria diagnostic strategy.

The 2021 NMIS obtained results for malaria species in the population sampled. Among children who tested positive for malaria, 91% had a *P. falciparum* infection only, 2% had a *P. malariae* infection only, 2% had a *P. ovale* infection only, 2% had a mixed *P. falciparum* and *P. ovale* infection, and 4% had a *P. falciparum* and *P. malariae* infection (**Table 4.9.1**).

LIST OF TABLES

For detailed information on malaria, see the following tables:

Table 4.1.1 Children with fever and care seeking, prompt treatment, and diagnosis: National

Percentage of children under age 5 with a fever in the 2 weeks preceding the survey, and among children under age 5 with fever, percentage for whom advice or treatment was sought, percentage for whom advice or treatment was sought the same or next day following the onset of fever, percentage who had blood taken from a finger or heel for testing, and percentage who were diagnosed with malaria by a health care provider, according to background characteristics, Nigeria MIS 2021

	Children under age 5		Children under age 5 with fever				
Background characteristic	Percentage with a 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 the same or next day	Percentage who had blood taken from a finger or heel for testing	Percentage who were diagnosed with malaria by a health care provider	Number of children
Age in months							
<12	32.1	2,069	59.4	31.9	15.8	36.6	665
12–23	43.5	2,015	65.6	33.0	27.2	44.3	876
24–35	39.9	2,121	62.0	29.5	27.9	48.8	847
36–47	36.4	2,175	64.4	31.7	23.0	43.4	791
48–59	31.7	2,424	62.0	32.6	25.6	52.3	768
Sex							
Male	37.1	5,523	63.0	32.2	25.1	46.1	2,051
Female	35.9	5,282	62.6	31.2	23.4	44.5	1,896
Residence							
Urban	31.3	3,050	64.2	33.8	23.1	43.6	955
Rural	38.6	7,755	62.4	31.0	24.7	45.9	2,992
Zone							
North Central	26.9	1,803	68.3	47.4	23.6	48.0	485
North East	35.8	1,910	54.3	33.0	27.5	45.5	684
North West	45.5	3,976	65.6	25.6	27.2	47.0	1,810
South East	32.5	864	78.2	50.0	13.6	54.4	281
South South	37.2	1,120	51.1	27.3	12.8	33.7	416
South West	23.9	1,133	58.6	29.1	26.3	37.9	270
Mother's education							
No education	39.6	4,935	59.4	23.0	24.3	45.9	1,952
Primary	39.1	1,663	67.1	38.3	31.0	49.1	651
Secondary	34.0	3,137	64.5	41.3	18.2	42.2	1,066
More than secondary	26.0	1,069	71.0	40.4	31.7	45.1	278
Wealth quintile							
Lowest	38.9	2,336	59.6	22.2	28.6	45.8	909
Second	41.8	2,377	62.0	28.6	24.2	46.8	993
Middle	37.1	2,162	64.5	35.9	23.8	48.8	802
Fourth	34.0	1,961	62.1	37.3	18.9	39.6	667
Highest	29.3	1,969	68.0	39.9	24.5	43.9	576
Total	36.5	10,805	62.8	31.7	24.3	45.3	3,947

[1] Includes advice or treatment from the following sources: public sector, private medical sector, NGO medical sector, chemist shop/patent and proprietary medicine vendor (PPMV), market, and itinerant drug seller. Excludes advice or treatment from a traditional practitioner.

Table 4.1.2 Children with fever and care seeking, prompt treatment, and diagnosis: States

Percentage of children under age 5 with a fever in the 2 weeks preceding the survey, and among children under age 5 with fever, percentage for whom advice or treatment was sought, percentage for whom advice or treatment was sought the same or next day following the onset of fever, percentage who had blood taken from a finger or heel for testing, and percentage who were diagnosed with malaria by a health care provider, by state, Nigeria MIS 2021

	Children under age 5		Children under age 5 with fever				
State	Percentage with a 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 the same or next day	Percentage who had blood taken from a finger or heel for testing	Percentage who were diagnosed with malaria by a health care provider	Number of children
North Central							
FCT-Abuja	29.2	177	77.7	60.4	21.3	54.8	52
Benue	18.3	264	(73.1)	(53.2)	(17.0)	(63.8)	48
Kogi	33.8	131	66.7	59.0	21.1	39.8	44
Kwara	24.4	183	(57.3)	(52.2)	(44.6)	(49.8)	45
Nasarawa	14.6	303	52.4	37.5	33.0	50.9	44
Niger	45.4	474	73.6	42.1	22.1	47.8	215
Plateau	13.6	271	(52.7)	(44.5)	(10.5)	(23.1)	37
North East							
Adamawa	23.2	244	65.6	40.9	18.8	36.7	57
Bauchi	50.2	625	59.1	43.9	35.6	54.7	314
Borno	20.2	291	48.1	10.5	13.6	11.7	59
Gombe	21.7	172	56.4	25.3	17.4	34.9	37
Taraba	24.4	227	46.8	32.8	22.2	55.7	55
Yobe	46.5	350	45.3	19.3	24.0	42.0	163
North West							
Jigawa	54.5	420	76.3	26.9	35.5	44.3	229
Kaduna	50.6	575	83.8	43.4	18.4	45.4	290
Kano	30.9	802	44.5	15.6	13.6	20.3	248
Katsina	29.6	1,000	80.5	42.8	52.9	67.6	296
Kebbi	67.3	569	47.1	11.7	20.2	48.7	383
Sokoto	66.1	399	71.1	17.7	22.0	47.9	264
Zamfara	47.1	211	51.7	18.6	32.9	53.5	100
South East							
Abia	41.1	153	79.1	66.9	11.3	61.6	63
Anambra	37.5	166	88.5	41.1	7.7	73.3	62
Ebonyi	26.8	297	72.0	50.9	19.7	45.3	80
Enugu	24.9	137	(73.2)	(31.7)	(12.1)	(47.4)	34
Imo	38.0	111	77.4	51.4	15.5	38.8	42
South South							
Akwa Ibom	44.2	250	44.4	24.9	4.9	14.6	110
Bayelsa	24.2	105	52.2	21.7	10.4	44.5	25
Cross River	40.6	157	58.4	47.7	14.8	46.0	64
Delta	37.3	272	42.6	12.9	20.9	19.2	101
Edo	40.8	123	64.1	38.1	23.4	57.2	50
Rivers	30.6	213	58.2	27.7	4.2	54.3	65
South West							
Ekiti	19.1	65	(41.2)	(5.9)	(6.0)	(13.9)	12
Lagos	34.6	352	73.4	45.6	26.7	31.5	122
Ogun	25.3	171	(39.4)	(10.0)	(24.3)	(43.1)	43
Ondo	15.2	88	(48.8)	(44.4)	(7.8)	(36.9)	13
Osun	15.7	157	(61.0)	(16.9)	(29.7)	(38.2)	25
Oyo	18.3	300	(46.0)	(14.4)	(34.5)	(53.6)	55
Total	36.5	10,805	62.8	31.7	24.3	45.3	3,947

Note: Figures in parentheses are based on 25–49 unweighted cases.

[1] Includes advice or treatment from the following sources: public sector, private medical sector, NGO medical sector, chemist shop/patent and proprietary medicine vendor (PPMV), market, and itinerant drug seller. Excludes advice or treatment from a traditional practitioner.

Table 4.2 Referral to higher level of care

Among children under age 5 with a fever in the 2 weeks preceding the survey for whom advice or treatment was sought, percentage who were referred to a higher level of care, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage who were referred to a higher level of care	Number of children with a fever for whom advice or treatment was sought[1]
Age in months		
<12	17.8	395
12–23	14.6	574
24–35	21.1	523
36–47	14.7	508
48–59	21.8	477
Sex		
Male	18.6	1,291
Female	17.1	1,186
Residence		
Urban	11.7	609
Rural	19.9	1,867
Zone		
North Central	8.9	331
North East	25.0	369
North West	23.2	1,187
South East	9.8	219
South South	4.2	213
South West	9.6	158
Mother's education		
No education	19.4	1,156
Primary	27.5	437
Secondary	11.5	687
More than secondary	10.0	197
Wealth quintile		
Lowest	24.9	539
Second	24.6	615
Middle	13.4	517
Fourth	9.7	414
Highest	12.3	391
Total	17.9	2,476

[1] Includes advice or treatment from the following sources: public sector, private medical sector, NGO medical sector, chemist shop/patent and proprietary medicine vendor (PPMV), market, and itinerant drug seller. Excludes advice or treatment from a traditional practitioner.

Table 4.3 Source of advice or treatment for children with fever

Percentage of children under age 5 with a fever in the 2 weeks preceding the survey for whom advice or treatment was sought from specific sources, and among children under age 5 with a fever in the 2 weeks preceding the survey for whom advice or treatment was sought, percentage for whom advice or treatment was sought from specific sources, Nigeria MIS 2021

	Percentage for whom advice or treatment was sought from each source:	
Source	Among children with fever	Among children with fever for whom advice or treatment was sought
Public sector	28.4	44.5
Government hospital	11.5	17.9
Government health centre	9.2	14.4
Government health post	5.2	8.1
Mobile clinic	0.3	0.4
Fieldworker/CHW	2.6	4.1
Private sector	19.7	30.8
Private hospital	2.9	4.5
Private clinic	2.5	3.8
Pharmacy	13.4	20.9
Private doctor	0.4	0.7
Mobile clinic	0.2	0.4
Fieldworker/CHW	0.4	0.6
Other private medical sector	0.0	0.1
Private medical sector (NGO)	0.1	0.1
NGO hospital	0.0	0.0
NGO clinic	0.1	0.1
Other private sector	16.0	25.0
Chemist shop/PPMV	14.5	22.7
Traditional practitioner	1.3	2.0
Market	0.1	0.1
Itinerant drug seller	0.1	0.1
Community-oriented resource person	0.2	0.3
Other	0.4	0.7
Number of children	3,947	2,524

Note: Advice or treatment for children with fever may have been sought from more than one source.
CHW = Community health worker
NGO = Nongovernmental organisation
PPMV = Patent and proprietary medicine vendor

Table 4.4 Type of antimalarial drugs used

Among children under age 5 with a fever in the 2 weeks preceding the survey for whom advice or treatment was sought, percentage who took specific antimalarial drugs, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of children who took:									Number of children with fever who took anti-malarial drug
	Any ACT	SP/ Fansidar	Chloro-quine	Amodia-quine	Quinine pills	Quinine injection/ IV	Artesunate rectal	Artesunate injection/ IV	Other anti-malarial	
Age in months										
<6	(44.8)	(17.7)	(29.3)	(2.2)	(0.0)	(0.0)	(0.0)	(6.0)	(0.0)	24
6–11	57.7	18.6	11.3	2.4	0.0	1.7	5.5	7.0	3.7	72
12–23	74.8	4.5	11.8	2.3	0.4	0.0	0.7	6.1	3.0	177
24–35	79.2	3.8	7.4	0.9	1.5	1.0	0.8	8.6	3.1	198
36–47	77.6	6.0	7.4	3.1	1.2	0.5	2.3	3.6	2.1	170
48–59	73.8	4.1	3.9	2.6	0.9	1.4	2.9	10.1	5.6	161
Sex										
Male	74.8	6.7	8.3	2.0	0.1	0.7	2.2	7.6	2.7	426
Female	72.8	5.7	9.1	2.4	1.8	0.9	1.6	6.5	4.1	376
Residence										
Urban	73.8	9.1	6.7	2.3	2.1	0.7	1.5	5.6	1.9	244
Rural	73.9	5.0	9.5	2.1	0.4	0.8	2.1	7.7	4.0	557
Zone										
North Central	78.5	9.2	5.6	2.5	0.0	0.4	3.9	5.8	0.3	164
North East	80.5	6.0	3.8	1.8	0.4	0.8	1.6	11.5	2.3	153
North West	57.7	8.7	20.4	2.7	1.0	2.1	2.3	6.7	2.5	113
South East	70.5	2.9	7.2	1.7	0.3	1.4	1.7	6.2	12.4	146
South South	77.9	1.9	8.0	2.2	3.2	0.0	1.0	6.5	1.0	110
South West	74.7	8.2	10.3	2.5	1.0	0.0	0.4	5.0	0.6	115
Mother's education										
No education	72.6	7.2	8.7	1.9	2.1	1.2	2.1	9.0	2.3	210
Primary	66.6	6.0	14.3	3.1	0.0	0.7	1.3	4.8	6.2	148
Secondary	76.1	6.0	8.2	1.8	0.8	0.0	2.4	6.4	3.5	330
More than secondary	79.1	5.4	2.5	2.4	0.0	2.3	0.9	8.7	1.1	114
Wealth quintile										
Lowest	69.7	2.7	13.7	2.1	1.0	0.3	0.0	12.8	5.0	86
Second	74.3	6.3	5.5	2.1	1.5	1.1	6.0	8.2	0.5	136
Middle	75.9	8.6	9.8	1.7	1.8	0.7	1.7	5.7	0.3	158
Fourth	75.5	4.6	9.9	2.2	0.7	0.7	0.6	8.7	1.4	187
Highest	72.5	7.1	6.9	2.6	0.0	0.9	1.5	3.9	7.9	233
Total	73.9	6.2	8.7	2.2	0.9	0.8	1.9	7.1	3.3	802

Note: Figures in parentheses are based on 25–49 unweighted cases.
ACT = Artemisinin-based combination therapy
SP = Sulfadoxine-pyrimethamine

Table 4.5 ACT use and fever

Among children under age 5 with a fever in the 2 weeks preceding the survey who received ACT, percentage whose fever went away after they received ACT, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage of children whose fever went away after they received ACT	Number of children with fever who received ACT
Age in months		
<6	*	11
6–11	(93.3)	42
12–23	89.1	132
24–35	91.7	157
36–47	87.8	132
48–59	87.1	119
Sex		
Male	88.6	319
Female	90.5	273
Residence		
Urban	89.5	180
Rural	89.4	412
Zone		
North Central	88.9	129
North East	92.9	123
North West	88.6	65
South East	89.7	103
South South	80.0	85
South West	95.2	86
Mother's education		
No education	92.4	152
Primary	92.4	99
Secondary	87.9	251
More than secondary	85.5	90
Wealth quintile		
Lowest	90.7	60
Second	91.7	101
Middle	87.5	120
Fourth	92.2	141
Highest	86.8	169
Total	89.5	592

Note: 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.
ACT = Artemisinin-based combination therapy

Table 4.6.1 Coverage of testing for anaemia and malaria in children: National

Percentage of eligible children age 6–59 months who were tested for anaemia and for malaria, according to background characteristics (unweighted), Nigeria MIS 2021

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children
Age in months				
6–8	95.0	95.2	94.6	558
9–11	95.3	95.3	94.7	470
12–17	96.2	96.2	95.3	1,171
18–23	95.4	95.4	94.6	983
24–35	96.8	96.8	96.3	2,340
36–47	97.2	97.2	96.5	2,527
48–59	96.1	96.1	95.8	3,048
Sex				
Male	96.3	96.3	95.8	5,698
Female	96.3	96.4	95.8	5,399
Mother's interview status				
Interviewed	96.6	96.6	96.1	9,429
Not interviewed and not in the household[1]	95.0	95.0	94.1	1,668
Residence				
Urban	94.6	94.7	94.4	3,276
Rural	97.0	97.1	96.4	7,821
Zone				
North Central	95.6	95.7	94.8	2,187
North East	96.6	96.6	96.2	2,117
North West	96.0	96.0	95.3	3,049
South East	98.0	98.0	97.4	1,173
South South	96.0	96.0	95.8	1,498
South West	96.9	96.9	96.6	1,073
Mother's education[2]				
No education	96.7	96.8	96.1	4,008
Primary	97.1	97.1	96.6	1,395
Secondary	96.9	96.9	96.7	3,023
More than secondary	94.2	94.3	93.9	1,003
Wealth quintile				
Lowest	96.2	96.2	95.5	2,280
Second	96.8	96.8	95.9	2,188
Middle	97.0	97.0	96.5	2,337
Fourth	96.4	96.4	96.2	2,262
Highest	95.2	95.3	94.7	2,030
Total	96.3	96.4	95.8	11,097

RDT = Rapid diagnostic test (SD BIOLINE P.f.)
[1] Includes children whose mothers are deceased
[2] Excludes children whose mothers were not interviewed

Table 4.6.2 Coverage of testing for anaemia and malaria in children: States

Percentage of eligible children age 6–59 months who were tested for anaemia and for malaria, by state (unweighted), Nigeria MIS 2021

State	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children
North Central				
FCT-Abuja	94.6	94.6	94.6	257
Benue	97.6	97.6	96.3	328
Kogi	96.7	96.7	95.8	213
Kwara	90.9	90.9	90.9	187
Nasarawa	99.8	99.8	99.8	453
Niger	93.3	93.5	90.5	401
Plateau	93.7	93.7	93.4	348
North East				
Adamawa	98.1	98.1	98.1	265
Bauchi	99.3	99.3	99.3	419
Borno	92.2	92.2	91.9	372
Gombe	92.0	92.0	90.2	287
Taraba	97.3	97.3	97.0	400
Yobe	99.7	99.7	99.2	374
North West				
Jigawa	94.5	94.5	94.1	421
Kaduna	95.0	95.0	94.8	442
Kano	95.2	95.2	93.4	558
Katsina	100.0	100.0	99.1	452
Kebbi	94.5	94.5	94.5	416
Sokoto	93.8	94.0	93.0	400
Zamfara	99.4	99.4	99.4	360
South East				
Abia	96.3	96.3	96.3	240
Anambra	98.0	98.5	97.5	199
Ebonyi	99.3	99.3	98.7	305
Enugu	100.0	100.0	99.6	223
Imo	95.6	95.6	94.7	206
South South				
Akwa Ibom	98.7	98.7	98.1	158
Bayelsa	96.8	96.8	96.8	251
Cross River	98.3	98.3	98.3	241
Delta	96.7	96.7	96.1	361
Edo	77.0	77.0	77.0	135
Rivers	99.1	99.1	99.1	352
South West				
Ekiti	96.8	96.8	96.8	155
Lagos	94.2	94.2	93.7	191
Ogun	96.6	96.6	96.1	179
Ondo	99.5	99.5	99.5	211
Osun	99.3	99.3	98.7	150
Oyo	95.2	95.2	95.2	187
Total	96.3	96.4	95.8	11,097

RDT = Rapid diagnostic test (SD BIOLINE P.f.)

Table 4.7.1 Haemoglobin <8.0 g/dl in children: National

Percentage of children age 6–59 months with haemoglobin lower than 8.0 g/dl, according to background characteristics, Nigeria MIS 2021

Background characteristic	Haemoglobin <8.0 g/dl	Number of children
Age in months		
6–8	6.7	581
9–11	6.0	489
12–17	11.7	1,175
18–23	9.8	987
24–35	9.5	2,367
36–47	7.0	2,548
48–59	6.2	2,953
Sex		
Male	8.4	5,701
Female	7.6	5,400
Mother's interview status		
Interviewed	8.0	9,584
Not interviewed and not in the household[1]	7.8	1,516
Residence		
Urban	4.8	3,005
Rural	9.2	8,095
Zone		
North Central	4.5	1,915
North East	9.5	1,991
North West	11.7	3,966
South East	4.2	901
South South	4.2	1,196
South West	5.3	1,131
Mother's education[2]		
No education	11.7	4,373
Primary	7.6	1,481
Secondary	4.2	2,797
More than secondary	2.9	932
Wealth quintile		
Lowest	12.6	2,430
Second	10.5	2,415
Middle	7.4	2,321
Fourth	4.7	2,035
Highest	3.0	1,899
Total	8.0	11,100

Note: 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).

[1] Includes children whose mothers are deceased

[2] Excludes children whose mothers were not interviewed

Table 4.7.2 Haemoglobin <8.0 g/dl in children: States

Percentage of children age 6–59 months with haemoglobin lower than 8.0 g/dl, by state, Nigeria MIS 2021

State	Haemoglobin <8.0 g/dl	Number of children
North Central		
FCT-Abuja	6.4	171
Benue	6.7	293
Kogi	7.3	153
Kwara	2.9	165
Nasarawa	1.2	402
Niger	4.8	465
Plateau	4.4	267
North East		
Adamawa	4.9	244
Bauchi	12.3	647
Borno	5.7	305
Gombe	11.2	182
Taraba	9.3	257
Yobe	10.2	356
North West		
Jigawa	1.9	445
Kaduna	6.9	583
Kano	12.2	838
Katsina	13.3	961
Kebbi	11.6	526
Sokoto	22.3	397
Zamfara	16.0	216
South East		
Abia	6.6	149
Anambra	2.5	159
Ebonyi	3.7	315
Enugu	6.8	166
Imo	1.0	111
South South		
Akwa Ibom	8.7	262
Bayelsa	1.1	110
Cross River	1.5	185
Delta	2.5	318
Edo	3.0	90
Rivers	5.3	232
South West		
Ekiti	2.9	75
Lagos	2.7	349
Ogun	9.4	173
Ondo	10.3	114
Osun	2.7	153
Oyo	6.3	268
Total	8.0	11,100

Note: 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).

Table 4.8.1 Prevalence of malaria in children: National

Percentage of children age 6–59 months classified in two tests as having malaria, according to background characteristics, Nigeria MIS 2021

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				
6–8	20.9	582	11.1	577
9–11	23.7	489	14.8	486
12–17	33.1	1,175	16.7	1,164
18–23	31.2	987	14.6	978
24–35	39.3	2,367	20.6	2,355
36–47	44.2	2,549	24.4	2,533
48–59	47.6	2,954	29.9	2,944
Sex				
Male	40.5	5,701	22.3	5,668
Female	38.6	5,402	22.2	5,369
Mother's interview status				
Interviewed	38.6	9,587	21.6	9,536
Not interviewed and not in the household[1]	46.2	1,516	26.5	1,501
Residence				
Urban	25.0	3,006	10.5	2,996
Rural	45.0	8,097	26.7	8,041
Zone				
North Central	32.3	1,916	17.0	1,899
North East	43.0	1,991	20.1	1,983
North West	51.6	3,967	29.8	3,940
South East	27.3	902	18.7	895
South South	29.9	1,196	17.8	1,192
South West	24.1	1,131	16.2	1,128
Mother's education[2]				
No education	52.1	4,375	30.4	4,345
Primary	42.3	1,481	22.6	1,472
Secondary	24.1	2,797	13.1	2,789
More than secondary	13.0	933	4.5	929
Wealth quintile				
Lowest	55.4	2,431	31.3	2,414
Second	53.6	2,416	32.3	2,395
Middle	40.1	2,321	23.1	2,309
Fourth	28.7	2,035	14.6	2,030
Highest	12.8	1,900	5.3	1,889
Total	39.6	11,103	22.3	11,037

RDT = Rapid diagnostic test (SD BIOLINE P.f)
[1] Includes children whose mothers are deceased
[2] Excludes children whose mothers were not interviewed

Table 4.8.2 Prevalence of malaria in children: States

Percentage of children age 6–59 months classified in two tests as having malaria, by state, Nigeria MIS 2021

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	34.6	171	18.8	171
Benue	34.0	293	17.6	290
Kogi	27.7	153	15.9	151
Kwara	17.6	165	5.6	165
Nasarawa	29.9	402	15.3	402
Niger	42.6	466	20.7	454
Plateau	26.4	267	18.8	266
North East				
Adamawa	28.0	244	10.7	244
Bauchi	59.6	647	31.7	647
Borno	18.6	305	5.6	304
Gombe	33.1	182	17.7	177
Taraba	24.5	257	17.9	256
Yobe	62.5	356	20.5	354
North West				
Jigawa	54.5	445	25.4	443
Kaduna	32.3	583	16.2	582
Kano	54.0	838	25.5	824
Katsina	49.5	961	29.3	955
Kebbi	75.6	526	49.0	526
Sokoto	40.3	397	35.9	395
Zamfara	59.7	216	36.6	216
South East				
Abia	26.4	149	14.5	149
Anambra	20.2	160	5.4	158
Ebonyi	30.2	315	25.7	312
Enugu	30.2	166	24.3	166
Imo	26.2	111	15.5	110
South South				
Akwa Ibom	33.5	262	30.1	259
Bayelsa	27.1	110	16.7	110
Cross River	40.6	185	23.6	185
Delta	18.9	318	10.0	316
Edo	30.2	90	22.6	90
Rivers	33.8	232	8.6	232
South West				
Ekiti	36.5	75	20.8	75
Lagos	3.2	349	2.6	347
Ogun	35.6	173	24.9	172
Ondo	44.8	114	26.7	114
Osun	27.6	153	19.3	152
Oyo	29.6	268	20.9	268
Total	39.6	11,103	22.3	11,037

RDT = Rapid diagnostic test (SD BIOLINE P.f.)

Table 4.9.1 Malaria species: National

Among children age 6–59 months with malaria parasites, percent distribution by species of *Plasmodium* as identified by microscopy, according to background characteristics, Nigeria MIS 2021

Background characteristic	Positive for *Pf* only	Positive for *Pm* only	Positive for *Po* only	Positive for *Pf* + *Po*	Positive for *Pf* + *Pm*	Total	Number of children with malaria parasites
Age in months							
6–8	92.6	1.7	3.5	0.0	2.2	100.0	64
9–11	98.9	0.0	0.0	0.0	1.1	100.0	72
12–17	96.9	0.5	0.0	1.0	1.6	100.0	194
18–23	95.8	0.0	1.0	0.6	2.6	100.0	143
24–35	91.0	1.4	1.7	2.3	3.6	100.0	486
36–47	88.2	1.8	1.5	2.2	6.3	100.0	619
48–59	90.1	2.5	1.8	1.3	4.3	100.0	880
Sex							
Male	92.3	1.3	1.2	1.6	3.6	100.0	1,264
Female	89.6	2.1	1.8	1.6	4.9	100.0	1,194
Residence							
Urban	91.6	1.4	1.6	0.4	5.1	100.0	313
Rural	90.9	1.7	1.5	1.8	4.1	100.0	2,145
Zone							
North Central	92.5	2.5	0.7	1.6	2.8	100.0	322
North East	93.2	0.6	2.1	0.6	3.5	100.0	398
North West	92.5	1.7	1.0	1.3	3.5	100.0	1,175
South East	89.8	0.7	2.5	2.0	5.1	100.0	168
South South	85.7	2.3	4.0	4.5	3.5	100.0	212
South West	81.2	2.6	1.3	2.1	12.8	100.0	183
Mother's education[1]							
No education	90.8	1.9	1.4	1.9	4.0	100.0	1,319
Primary	91.3	0.7	1.7	1.6	4.7	100.0	333
Secondary	90.4	1.6	2.7	0.4	5.0	100.0	365
More than secondary	(94.5)	(0.8)	(1.8)	(1.8)	(1.2)	100.0	42
Wealth quintile							
Lowest	91.1	1.2	1.0	2.2	4.4	100.0	755
Second	90.2	2.1	1.8	1.5	4.4	100.0	773
Middle	91.8	1.7	1.4	1.5	3.6	100.0	534
Fourth	90.8	1.8	2.2	0.8	4.5	100.0	296
Highest	92.1	1.8	1.8	0.7	3.5	100.0	100
Total	91.0	1.7	1.5	1.6	4.2	100.0	2,458

Note: No cases of *Plasmodium vivax* were found.
Pf = *Plasmodium falciparum*
Pm = *Plasmodium malariae*
Po = *Plasmodium ovale*
[1] Excludes children whose mothers were not interviewed

Table 4.9.2 Malaria species: States

Among children age 6–59 months with malaria parasites, percent distribution by species of *Plasmodium* as identified by microscopy, by state, Nigeria MIS 2021

State	Positive for *Pf* only	Positive for *Pm* only	Positive for *Po* only	Positive for *Pf* + *Po*	Positive for *Pf* + *Pm*	Total	Number of children with malaria parasites
North Central							
FCT-Abuja	(87.9)	(6.0)	(0.0)	(0.0)	(6.0)	100.0	32
Benue	87.3	4.1	1.0	0.0	7.6	100.0	51
Kogi	(90.2)	(3.5)	(1.6)	(0.0)	(4.6)	100.0	24
Kwara	*	*	*	*	*	100.0	9
Nasarawa	94.4	3.2	0.0	1.4	1.1	100.0	61
Niger	96.1	1.2	0.0	2.1	0.7	100.0	94
Plateau	91.7	0.0	2.7	4.5	1.2	100.0	50
North East							
Adamawa	(96.2)	(0.0)	(3.8)	(0.0)	(0.0)	100.0	26
Bauchi	91.0	0.5	3.0	0.0	5.6	100.0	205
Borno	*	*	*	*	*	100.0	17
Gombe	(96.2)	(0.0)	(1.4)	(2.4)	(0.0)	100.0	31
Taraba	93.6	2.0	0.8	0.0	3.6	100.0	46
Yobe	96.5	0.6	0.7	1.2	1.0	100.0	73
North West							
Jigawa	91.8	1.9	0.7	0.0	5.6	100.0	112
Kaduna	96.7	0.0	0.0	0.0	3.3	100.0	94
Kano	96.3	0.6	0.0	1.2	1.9	100.0	210
Katsina	90.2	4.2	1.8	1.9	2.0	100.0	280
Kebbi	91.7	1.0	0.9	2.1	4.2	100.0	258
Sokoto	93.7	0.6	1.0	0.0	4.7	100.0	142
Zamfara	86.7	1.9	2.4	2.5	6.6	100.0	79
South East							
Abia	(97.2)	(0.0)	(0.0)	(2.8)	(0.0)	100.0	22
Anambra	*	*	*	*	*	100.0	9
Ebonyi	90.8	1.4	2.6	0.0	5.3	100.0	80
Enugu	(79.0)	(0.0)	(3.7)	(6.7)	(10.6)	100.0	40
Imo	(96.0)	(0.0)	(4.0)	(0.0)	(0.0)	100.0	17
South South							
Akwa Ibom	(74.7)	(5.7)	(8.4)	(8.4)	(2.8)	100.0	78
Bayelsa	(94.1)	(2.3)	(2.3)	(0.0)	(1.3)	100.0	18
Cross River	88.4	0.0	0.0	4.4	7.1	100.0	44
Delta	(96.6)	(0.0)	(0.0)	(1.4)	(2.0)	100.0	32
Edo	(87.2)	(0.0)	(7.8)	(2.8)	(2.2)	100.0	20
Rivers	(96.0)	(0.0)	(0.0)	(0.0)	(4.0)	100.0	20
South West							
Ekiti	(76.6)	(7.3)	(5.4)	(0.0)	(10.7)	100.0	16
Lagos	*	*	*	*	*	100.0	9
Ogun	(85.0)	(2.4)	(0.0)	(1.9)	(10.7)	100.0	43
Ondo	80.7	2.0	0.0	3.8	13.5	100.0	30
Osun	(82.6)	(7.0)	(5.1)	(0.0)	(5.3)	100.0	29
Oyo	(76.2)	(0.0)	(0.0)	(3.3)	(20.5)	100.0	56
Total	91.0	1.7	1.5	1.6	4.2	100.0	2,458

Note: No cases of *Plasmodium vivax* were found.
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.
Pf = Plasmodium falciparum
Pm = Plasmodium malariae
Po = Plasmodium ovale

MALARIA BELIEFS AND EXPOSURE TO MALARIA MESSAGES

5

Key Findings

Media exposure to malaria messages:

- 46% of women age 15–49 reported having seen or heard a malaria message in the past 6 months.
- Among women who have seen or heard a malaria message, radio (39%), community health workers (24%), television (22%), and health care providers (19%) are the most common sources of information.

Knowledge of ways to avoid malaria:

- 81% of women stated that there are ways to avoid getting malaria. Among women who said there are ways to avoid malaria, 83% cited sleeping under a mosquito net or insecticide-treated net (ITN).

Malaria susceptibility, severity, and self-efficacy:

- 89% of women perceive that their families and communities are at risk of malaria.
- 60% of women feel that the consequences of malaria are serious.
- 76% of women agree that they can sleep inside a mosquito net for the entire night when there are few mosquitoes.

Attitude towards malaria-related behaviours and norms:

- 64% of women believe that the majority of people in their community currently practise specific malaria-related behaviours.

This chapter assesses the extent to which malaria communication messages reach women age 15–49 and the channels through which women receive such messages. The chapter also provides data on women's basic knowledge about treatment and prevention of malaria, their perceptions of susceptibility to malaria and its severity, and their confidence in changing behaviour (i.e., self-efficacy).

5.1 EXPOSURE TO MALARIA MESSAGES

Exposure to communication messages

Percentage of women age 15–49 who recall seeing or hearing a message about malaria through various sources in the last 6 months.

Sample: Women age 15–49

Advocacy communication and social mobilisation (ACSM) is key to the uptake of malaria control interventions. In the current National Malaria Strategic Plan (NMSP) 2021–2025, ACSM serves as a supportive strategy for implementation of the plan's five objectives. An efficient ACSM intervention is

necessary for the successful implementation of all malaria prevention, diagnostic, treatment coordination, management, financing, and reporting strategies (NMEP 2021).

The priority ACSM interventions include promoting actionable, audience-specific, pretested messages on effective malaria prevention behaviours using multimedia approaches; promoting access to and utilisation of malaria prevention interventions; and engaging community actors, including leaders, members, and community-based organisations, to support utilisation of mosquito nets and other preventive services. Other priority interventions include strengthening social mobilisation efforts through existing national, subnational, and community structures; reinforcing multimedia approaches to reach target audiences with appropriate information on malaria diagnosis and treatment practises; and strengthening use of appropriate evidence of the effectiveness of social and behaviour change (SBC) strategies.

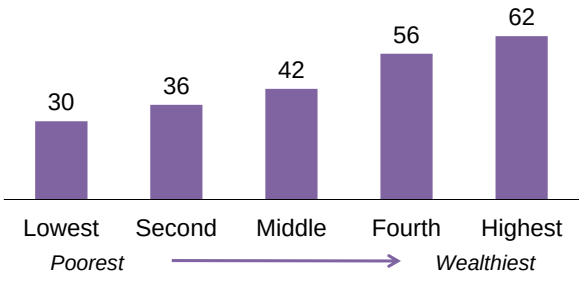
Information exposure plays a critical role in behavioural changes that will help increase malaria prevention knowledge and practises. To assess the coverage of malaria messages, women age 15–49 were asked if they had seen or heard any messages about malaria prevention in the 6 months preceding the survey. Women who had seen or heard messages were further asked about the source of the messages. Forty-six percent of women reported seeing or hearing a malaria message in the past 6 months. Radio (39%) was the most common source of exposure to malaria messages, followed by community health workers (24%) and television (22%). Other sources included health care providers (19%), family and friends (11%), social media (11%), town announcers (5%), posters/billboards (4%), newspapers/magazines (2%), and leaflets/brochures (2%) (**Table 5.1.1**).

Patterns by background characteristics

- Sixty-two percent of women in the highest wealth quintile have been exposed to malaria messages from any source, as compared with 30% of women in the lowest wealth quintile (**Figure 5.1**).

Figure 5.1 **Exposure to social and behaviour change communication messages by wealth quintile**

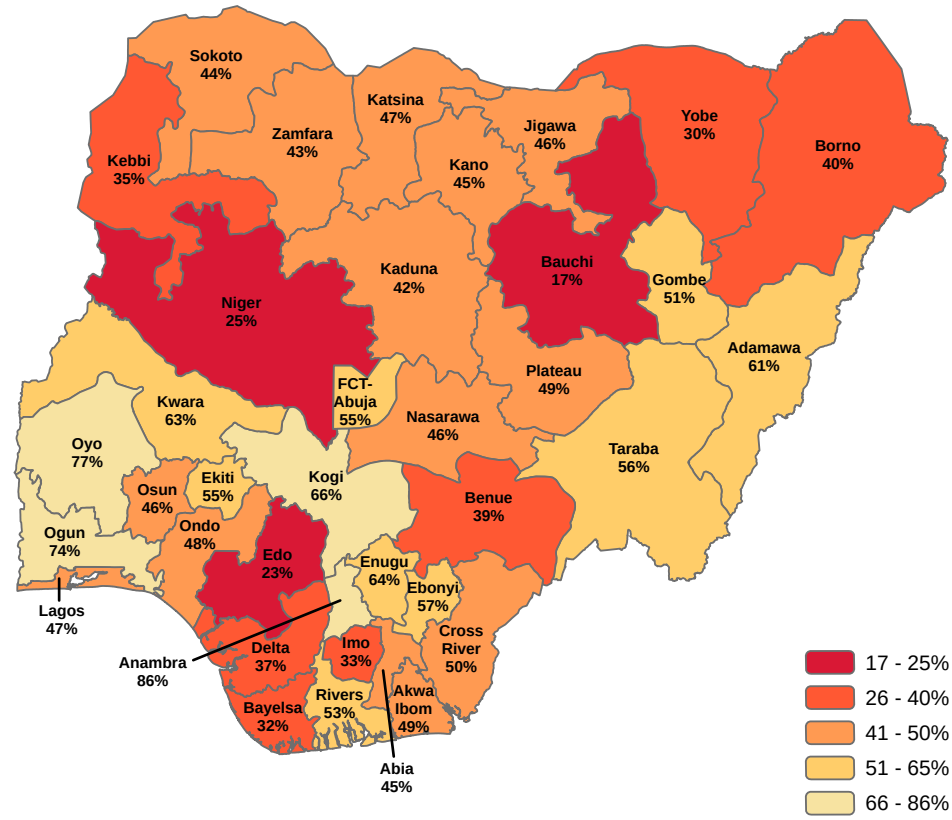
Percentage of women age 15–49 who saw or heard a message on malaria in the last 6 months



- Exposure to social and behaviour change communication messages varies among states in Nigeria. The states with the highest levels of exposure are Anambra (86%), Oyo (77%), and Ogun (74%), while the states with the lowest levels include Bauchi (17%), Edo (23%), and Niger (25%) (**Table 5.1.2** and **Figure 5.2**).
- Sixty-seven percent of women with more than a secondary education were exposed to malaria messages from any source in the last 6 months, compared with 34% of women with no education.
- The percentage of women who have seen or heard a malaria message in the past 6 months ranges from 38% in North East to 61% in South East.
- Women in urban areas are more likely than women in rural areas to have seen or heard a malaria message in the past 6 months (55% versus 42%).

Figure 5.2 Exposure to social and behaviour change communication messages by state

Percentage of women age 15–49 who saw or heard a message on malaria in the last 6 months



5.2 KNOWLEDGE OF WAYS TO AVOID MALARIA

Better knowledge of ways to avoid and prevent malaria, such as increasing use of insecticide-treated nets (ITNs), is a foundational step towards changing behaviour. Women age 15–49 were asked if there are ways to avoid getting malaria. Women who said that there are ways to avoid getting malaria were further asked to report specific ways to avoid malaria. Eighty-one percent of women stated that there are ways to avoid getting malaria. Among those who said there are ways to avoid getting malaria, 83% cited sleeping under a mosquito net or ITN (**Table 5.2.1**).

Other commonly cited measures included keeping one's surroundings clean (33%), using mosquito repellent (21%), spraying the house with insecticide (18%), filling in stagnant water (12%), taking preventive medications (11%), and putting mosquito screens on windows (6%) (**Table 5.2.1**).

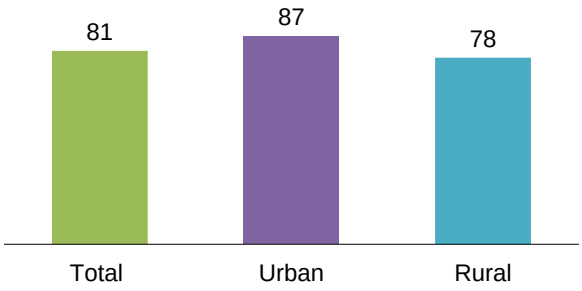
Trends: The percentage of women age 15–49 who say there are ways to avoid getting malaria decreased from 93% in 2015 to 81% in 2021. However, among women who say there are ways to avoid getting malaria, the percentage who agree that sleeping inside a mosquito net helps to avoid malaria increased from 33% to 83% over the same period.

Patterns by background characteristics

- A higher percentage of women in urban areas (87%) than rural areas (78%) said that there are ways to avoid getting malaria (**Figure 5.3**).
- By state, the percentage of women who said that there are ways to avoid getting malaria ranges from 44% in Niger to 99% in Anambra (**Table 5.2.2**).
- Ninety-five percent of women with more than a secondary education said that there are ways to avoid getting malaria, as compared with 72% of women with no education.
- Among women who said there are ways to avoid getting malaria, the percentage who cite sleeping under a mosquito net or ITN as a way to avoid malaria ranges from 69% in South West to 93% in North East.

Figure 5.3 **Knowledge that there are ways to avoid malaria by residence**

Percentage of women age 15–49 who stated there are ways to avoid getting malaria



5.3 PERCEIVED SUSCEPTIBILITY, SEVERITY, AND SELF-EFFICACY

Risk involves the following components: the likelihood of a specific event occurring (perceived susceptibility) multiplied by the magnitude of consequences associated with that event (perceived severity) (Douglas 1986). Self-efficacy refers to people's confidence in their ability to perform a specific behaviour.

During the survey, a series of statements were read to capture respondents' perceptions of malaria susceptibility, their beliefs regarding the severity of the consequences of malaria, and their perceived self-efficacy to perform specific malaria-related behaviours. Eighty-nine percent of women perceive that their families and communities are at risk for malaria, and 60% believe that the consequences of malaria are serious. Thirty-eight percent of women disagree that getting malaria is not a problem because it can be easily treated and 50% disagree that only weak children can die from malaria (**Table 5.3.1**).

Eighty-eight percent of women said that they are confident in their ability to perform specific malaria-related behaviours. This includes women who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes or agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes (**Table 5.3.1**).

Trends: The percentage of women age 15–49 who disagree that only weak children can die from malaria increased from 30% in 2018 to 50% in 2021, while the percentage who disagree that getting malaria is not a problem because it can be easily treated decreased from 46% to 38%.

Patterns by background characteristics

- The percentage of women who perceive that their families and communities are at risk for malaria ranges from 83% in South East to 92% in South South (**Table 5.3.1**).
- A higher percentage of women in urban areas (62%) than in rural areas (59%) believe that the consequences of malaria are serious.
- The percentage of women who believe that the consequences of malaria are serious ranges from 53% each in North East and North West to 77% in South East.
- The percentage of women who feel that the consequences of malaria are serious increases with increasing household wealth, from 54% in the lowest wealth quintile to 64% in the highest wealth quintile.
- Women with more than a secondary education (67%) are more likely to feel that the consequences of malaria are serious than women with no education (53%).
- The percentage of women who are confident in their ability to perform specific malaria-related behaviours ranges from 82% in South South to 92% in North Central.
- By state, the percentage of women who are confident in their ability to perform specific malaria-related behaviours ranges from 67% in Ogun to 99% in Sokoto (**Table 5.3.2**).

5.4 Attitudes towards Malaria-related Behaviours and Perceptions of Community Norms

People who view a behaviour favourably or positively are more likely to adopt the behaviour. Those with favourable attitudes towards a behaviour anticipate beneficial outcomes (such as seeking prompt care to ensure peace of mind) or feel that the behaviour has positive attributes (such as sleeping under a net feels safe).

Women were asked whether they do not like sleeping under a mosquito net when the weather is too warm, whether it is best to start giving a child with a fever any medicine they have at home, and whether it is important that children take the full dose of medicine that they are prescribed for malaria. If they disagreed with either of the first two statements or agreed with the third statement, they were considered to have a favourable attitude towards specific malaria-related behaviours. Overall, 96% of women had a favourable attitude towards specific malaria behaviours (**Table 5.4.1**).

Beliefs about what others do and what others think we should do often guide our actions. These types of beliefs are called norms. Malaria programmes can influence behaviours if they portray certain behaviours as socially desirable or socially unacceptable. Sixty-four percent of women believe that most people in their community currently practise specific malaria-related behaviours (**Table 5.4.1**). This includes women who agree that people in their community usually take their children to a health care provider on the same day or the day after they develop a fever or agree that people in the community who have a mosquito net usually sleep under a mosquito net every night.

Patterns by background characteristics

- The percentage of women with a favourable attitude towards specific malaria behaviours ranges from 95% among those with no education to 98% among those with more than a secondary education.

- The percentage of women with a favourable attitude towards specific malaria-related behaviours increases with increasing household wealth, from 94% in the lowest wealth quintile to 98% in the highest quintile.

- The percentage of women who believe that the majority of people in their community currently practise specific malaria-related behaviours ranges from 49% in South South to 75% in North West.

- By state, the percentage of women who believe the majority of people in their community currently practise specific malaria-related behaviours ranges from 22% in Abia to 98% each in Bauchi and Sokoto (**Table 5.4.2**).

LIST OF TABLES

For detailed information on malaria beliefs and exposure to malaria messages, see the following tables:

- **Table 5.1.1 Media exposure to malaria messages: National**
- **Table 5.1.2 Media exposure to malaria messages: States**
- **Table 5.2.1 Knowledge of ways to avoid malaria: National**
- **Table 5.2.2 Knowledge of ways to avoid malaria: States**
- **Table 5.3.1 Malaria susceptibility, severity, and self-efficacy: National**
- **Table 5.3.2 Malaria susceptibility, severity, and self-efficacy: States**
- **Table 5.4.1 Attitudes towards malaria-related behaviours and malaria norms: National**
- **Table 5.4.2 Attitudes towards malaria-related behaviours and malaria norms: States**

Table 5.1.1 Media exposure to malaria messages: National

Percentage of women age 15–49 who have seen or heard a malaria message in the last 6 months, and among those who have seen or heard a malaria message in the last 6 months, percentage who cite specific sources for malaria messages, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage who have seen or heard a malaria message in the past 6 months	Number of women	Source of exposure to malaria messages in the past 6 months													
			Radio	Television	Poster/ billboard	Newspaper/ magazine	Leaflet/ brochure	Health care provider	Community health worker	Social media	Town announcer	Inter-personal communi-cation agent/ community volunteer	Family/ friends	Other	Don't remember	Number of women who have seen or heard a message
Age																
15–19	39.2	2,793	37.3	23.2	5.2	1.3	1.5	12.6	20.1	11.0	4.2	4.7	17.5	2.8	0.4	1,095
20–24	43.3	2,464	32.1	18.9	4.5	2.2	2.4	21.2	24.9	13.2	5.8	4.0	10.9	0.6	0.5	1,067
25–29	46.6	2,660	38.0	20.7	2.9	1.7	3.0	22.2	25.0	11.9	4.2	4.7	9.0	0.3	0.6	1,241
30–34	48.3	2,362	39.3	19.9	3.9	2.1	1.4	22.9	25.7	9.9	5.5	4.7	7.8	0.7	0.8	1,141
35–39	50.8	1,964	43.0	24.9	4.4	1.8	2.6	19.3	25.0	10.6	3.8	4.1	9.9	0.9	0.6	998
40–44	50.9	1,420	44.3	21.3	3.4	1.7	2.3	16.6	22.7	8.1	5.3	6.0	10.5	0.9	0.3	722
45–49	52.5	814	48.3	29.0	5.4	4.4	1.3	15.5	21.8	8.8	4.7	3.6	11.6	0.7	0.6	427
Residence																
Urban	54.9	4,641	38.9	31.0	6.1	3.0	2.7	18.4	18.7	16.2	4.4	4.9	10.1	1.3	0.2	2,547
Rural	42.1	9,835	39.5	16.3	3.0	1.4	1.8	19.6	27.0	7.5	5.0	4.4	11.5	0.8	0.7	4,145
Zone																
North Central	45.3	2,377	36.5	26.2	3.0	2.0	5.1	31.3	23.7	10.0	3.3	3.4	4.8	0.7	0.2	1,078
North East	37.6	2,399	24.9	12.7	5.7	1.1	0.5	18.2	29.8	4.1	8.4	1.7	18.4	1.7	0.0	903
North West	43.9	4,832	42.6	8.0	2.1	0.9	0.9	12.9	23.7	4.4	6.1	6.9	12.6	0.4	1.3	2,121
South East	60.6	1,111	54.3	35.9	4.6	3.3	1.7	14.5	26.6	21.0	0.7	3.5	6.5	0.8	0.0	673
South South	41.8	1,734	32.5	27.0	3.0	1.6	2.0	15.2	13.6	13.2	3.7	6.6	20.1	3.6	0.4	725
South West	59.0	2,023	42.1	38.9	8.1	4.0	3.2	24.8	24.4	20.9	4.0	3.0	4.9	0.3	0.2	1,193
Education																
No education[1]	34.1	5,156	37.3	3.9	1.4	0.5	0.7	17.5	30.1	0.3	7.8	5.2	10.6	0.4	1.2	1,758
Primary	45.6	2,089	39.8	11.8	2.5	0.0	1.5	17.4	31.7	2.4	5.7	5.1	11.9	0.4	0.2	953
Secondary	51.0	5,364	41.0	28.4	5.7	2.2	2.5	20.3	21.1	10.9	3.9	4.6	12.8	1.6	0.5	2,734
More than secondary	66.8	1,867	37.8	40.8	5.9	5.2	3.9	20.3	15.1	31.8	1.7	3.4	6.7	1.0	0.0	1,248
Wealth quintile																
Lowest	29.9	2,651	26.7	0.9	1.2	0.2	0.6	16.3	38.5	0.2	7.4	3.2	14.8	0.6	0.4	794
Second	36.2	2,730	34.5	1.5	2.4	1.1	1.4	17.6	32.0	0.7	6.9	4.2	13.2	1.0	0.7	989
Middle	42.3	2,799	37.8	5.3	3.4	0.5	2.0	21.7	25.7	3.9	6.9	6.1	15.5	1.0	0.5	1,184
Fourth	55.7	3,006	44.6	24.5	3.0	1.1	1.4	17.9	21.1	8.7	4.5	5.1	9.8	1.1	0.7	1,673
Highest	62.4	3,289	42.8	47.4	7.5	4.8	3.8	20.5	15.5	25.5	1.7	3.9	6.7	1.1	0.4	2,052
Total	46.2	14,476	39.2	21.9	4.1	2.0	2.1	19.1	23.9	10.8	4.8	4.6	10.9	1.0	0.5	6,692

Note: More than one source may have been cited.
[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 5.1.2 Media exposure to malaria messages: States

Percentage of women age 15–49 who have seen or heard a malaria message in the last 6 months, and among those who have seen or heard a malaria message in the last 6 months, percentage who cite specific sources for malaria messages, by state, Nigeria MIS 2021

State	Percentage who have seen or heard a malaria message in the past 6 months	Number of women	Source of exposure to malaria messages in the past 6 months													
			Radio	Television	Poster/ billboard	Newspaper/ magazine	Leaflet/ brochure	Health care provider	Community health worker	Social media	Town announcer	Inter-personal communi-cation agent/ community volunteer	Family/ friends	Other	Don't remember	Number of women who have seen or heard a message
North Central																
FCT-Abuja	54.5	238	20.4	57.1	3.0	2.3	6.2	38.3	12.3	25.9	1.0	4.5	17.1	0.0	0.0	130
Benue	38.6	418	27.0	21.1	3.2	1.2	7.3	29.8	37.7	9.8	1.9	0.0	2.9	1.9	0.0	161
Kogi	65.8	251	22.0	24.3	3.9	7.5	15.0	49.2	23.0	5.0	1.1	3.0	9.9	2.4	0.0	165
Kwara	63.0	277	65.9	30.3	1.8	2.0	1.2	9.3	12.2	21.9	0.0	3.3	0.0	0.5	1.5	175
Nasarawa	46.3	358	39.6	23.8	3.4	0.0	0.0	29.6	22.5	1.9	15.3	1.7	0.0	0.0	0.0	166
Niger	25.2	537	26.2	14.5	4.7	0.5	6.0	32.2	35.7	1.7	2.4	11.0	3.0	0.0	0.0	135
Plateau	48.9	298	48.9	15.0	0.9	0.0	0.3	33.6	23.4	4.3	0.3	2.0	3.2	0.0	0.0	146
North East																
Adamawa	60.9	336	16.9	23.9	18.0	1.5	0.4	15.2	46.6	1.6	6.4	1.4	17.7	0.3	0.0	204
Bauchi	17.1	703	38.8	7.3	2.9	1.7	0.0	24.5	30.0	4.6	16.3	1.3	20.4	0.0	0.0	120
Borno	40.2	358	7.1	0.4	0.4	0.4	0.0	24.3	21.8	0.0	2.9	3.8	44.2	4.6	0.0	144
Gombe	51.1	279	25.7	6.8	0.0	0.0	0.0	10.1	15.0	6.8	20.9	0.0	16.9	0.8	0.0	143
Taraba	56.3	276	28.5	19.2	3.4	2.7	2.6	22.0	24.0	3.6	5.0	1.3	4.3	4.2	0.3	155
Yobe	30.4	447	38.6	12.3	3.7	0.0	0.0	15.1	35.2	9.4	0.9	2.8	8.2	0.3	0.0	136
North West																
Jigawa	46.1	566	37.3	11.4	3.8	4.7	2.7	15.7	26.3	15.8	12.7	4.1	6.5	0.0	0.0	261
Kaduna	42.3	690	21.5	9.6	4.4	1.0	3.4	32.7	29.4	6.0	2.5	4.0	27.9	1.4	0.6	292
Kano	44.9	920	50.1	6.3	0.8	0.3	0.3	7.4	12.8	4.6	5.7	21.0	15.9	0.0	0.8	413
Katsina	47.3	1,362	32.8	8.3	0.0	0.2	0.0	12.0	35.0	2.2	3.7	2.9	12.5	0.4	0.0	643
Kebbi	35.2	613	60.7	2.4	0.0	0.0	0.0	10.6	20.7	0.5	2.6	7.6	4.3	1.1	1.1	216
Sokoto	44.1	399	66.2	1.0	0.0	0.0	0.0	1.6	6.6	0.0	11.8	1.0	6.6	0.0	11.4	176
Zamfara	42.6	282	65.6	21.2	15.6	1.7	0.6	3.9	11.6	0.5	12.5	0.8	1.1	0.0	0.0	120
South East																
Abia	45.1	178	55.2	37.3	0.0	4.6	2.8	14.0	16.5	32.2	0.0	8.9	3.9	1.8	0.0	80
Anambra	85.8	283	58.8	52.6	11.5	6.5	2.0	18.4	32.8	34.9	0.0	1.2	5.2	0.7	0.0	243
Ebonyi	57.1	297	68.9	26.5	0.6	0.3	0.0	14.0	25.1	5.0	0.6	4.3	1.7	0.9	0.0	169
Enugu	64.3	204	31.2	24.9	1.1	0.0	3.2	5.4	27.6	11.6	2.4	4.2	13.4	0.0	0.0	131
Imo	33.1	149	42.3	13.1	1.1	4.8	0.0	22.5	15.0	13.8	1.0	1.1	15.0	1.0	0.0	49
South South																
Akwa Ibom	48.9	478	51.4	21.2	2.5	0.8	1.9	16.0	11.6	14.5	6.8	1.2	32.8	0.0	0.6	233
Bayelsa	32.1	131	14.7	27.4	4.1	0.5	0.8	24.4	16.8	20.1	5.8	3.5	12.2	2.0	0.7	42
Cross River	49.9	224	31.1	22.9	8.8	6.3	3.0	21.0	21.6	12.9	0.0	1.2	6.3	16.6	0.0	112
Delta	36.5	298	20.4	29.1	2.3	0.0	2.1	10.3	22.6	7.1	2.2	3.1	12.2	1.6	0.0	109
Edo	23.1	300	21.3	39.6	0.0	1.7	0.0	17.7	9.1	7.8	4.5	1.5	7.1	5.7	1.3	69
Rivers	52.5	304	23.8	31.2	1.4	0.5	2.5	9.6	6.2	16.0	1.6	23.6	24.2	0.8	0.0	160
South West																
Ekiti	54.5	123	73.6	17.5	2.1	1.1	1.1	12.8	4.4	9.5	11.1	2.3	7.5	1.5	0.3	67
Lagos	47.2	620	15.1	42.5	2.6	0.9	1.5	30.7	10.0	24.8	1.3	2.3	4.3	0.6	0.0	292
Ogun	73.6	308	27.2	25.5	0.0	1.2	0.9	37.8	32.5	13.4	2.3	0.0	1.4	0.0	0.0	226
Ondo	47.9	156	36.1	12.8	1.0	0.9	0.4	15.3	12.8	16.1	0.8	5.9	16.6	0.5	3.1	75
Osun	46.4	320	51.6	20.9	0.7	2.5	0.0	7.8	26.9	13.1	4.3	15.5	14.4	0.3	0.0	149
Oyo	77.3	497	63.4	59.6	22.4	9.8	8.0	23.3	35.4	28.3	6.5	0.0	1.1	0.0	0.0	384
Total	46.2	14,476	39.2	21.9	4.1	2.0	2.1	19.1	23.9	10.8	4.8	4.6	10.9	1.0	0.5	6,692

Note: More than one source may have been cited.

Table 5.2.1 Knowledge of ways to avoid malaria: National

Percentage of women age 15–49 who state there are ways to avoid getting malaria, and among women who state there are ways to avoid getting malaria, percentage reporting specific ways to avoid getting malaria, according to background characteristics, Nigeria MIS 2021

Background characteristic	Percentage who state there are ways to avoid getting malaria	Number of women	Ways to avoid getting malaria									Number of women who state there are ways to avoid getting malaria
			Sleep under mosquito net or ITN	Use mosquito repellent	Take preventive medications	Spray house with insecticide	Fill in stagnant water (puddles)	Keep surroundings clean	Put mosquito screen on windows	Other	Don't know	
Age												
15–19	78.8	2,793	85.1	24.6	10.5	18.0	11.1	32.5	4.9	1.5	0.1	2,200
20–24	80.3	2,464	85.0	20.2	11.2	17.1	9.8	29.8	5.3	2.6	0.3	1,978
25–29	79.9	2,660	82.5	18.8	10.6	16.5	10.9	33.7	6.4	3.5	0.2	2,125
30–34	81.6	2,362	82.9	18.7	9.3	19.2	13.6	32.3	5.6	4.0	0.2	1,927
35–39	83.5	1,964	80.9	19.9	11.2	20.4	13.6	33.9	7.2	3.8	0.1	1,639
40–44	81.9	1,420	80.9	20.4	11.8	18.4	11.6	31.6	7.7	2.9	0.4	1,163
45–49	82.7	814	81.9	20.2	11.8	21.6	13.5	35.2	7.9	4.0	0.0	673
Residence												
Urban	87.0	4,641	82.6	21.6	11.7	25.8	16.0	39.1	9.2	3.4	0.2	4,037
Rural	78.0	9,835	83.3	19.9	10.2	14.4	9.6	29.0	4.5	2.9	0.2	7,670
Zone												
North Central	76.7	2,377	86.2	10.2	10.8	28.4	17.4	34.1	6.2	3.6	0.0	1,822
North East	79.7	2,399	93.0	24.2	13.3	11.8	5.6	20.0	2.1	1.1	0.0	1,911
North West	80.8	4,832	85.9	28.0	5.6	9.5	6.7	17.3	3.0	0.9	0.3	3,904
South East	87.0	1,111	83.3	10.4	15.7	15.3	11.0	56.2	15.1	2.6	0.1	966
South South	72.3	1,734	74.8	15.7	15.2	25.4	15.3	47.5	8.2	6.6	0.7	1,254
South West	91.4	2,023	68.9	19.4	13.5	30.8	21.6	53.3	10.9	7.1	0.2	1,849
Education												
No education[1]	72.3	5,156	86.7	22.7	5.9	7.7	3.5	13.3	1.7	0.8	0.2	3,726
Primary	77.7	2,089	81.7	21.1	11.8	12.7	8.5	26.6	4.7	2.9	0.3	1,623
Secondary	85.6	5,364	80.6	19.4	12.3	22.8	15.0	42.4	8.5	4.0	0.2	4,590
More than secondary	94.7	1,867	82.7	18.0	16.0	34.5	23.9	52.6	11.0	5.7	0.0	1,767
Wealth quintile												
Lowest	72.5	2,651	87.3	22.4	4.9	5.6	3.5	10.9	1.1	0.7	0.1	1,922
Second	72.5	2,730	86.7	22.9	7.7	8.0	4.6	17.3	1.8	1.1	0.2	1,979
Middle	78.3	2,799	85.2	18.7	10.5	15.7	9.5	28.7	3.5	2.6	0.5	2,193
Fourth	85.8	3,006	80.4	20.3	11.9	20.5	14.0	39.3	6.4	4.1	0.3	2,579
Highest	92.3	3,289	78.6	19.1	15.6	33.4	21.6	53.0	13.9	5.3	0.0	3,035
Total	80.9	14,476	83.0	20.5	10.8	18.4	11.8	32.5	6.2	3.1	0.2	11,707

Note: More than one source may have been cited.
ITN = insecticide-treated net
[1] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 5.2.2 Knowledge of ways to avoid malaria: States

Percentage of women age 15–49 who state there are ways to avoid getting malaria, and among women who state there are ways to avoid getting malaria, percentage reporting specific ways to avoid getting malaria, by state, Nigeria MIS 2021

State	Percentage who state there are ways to avoid getting malaria	Number of women	Ways to avoid getting malaria									Number of women who state there are ways to avoid getting malaria
			Sleep under mosquito net or ITN	Use mosquito repellent	Take preventive medications	Spray house with insecticide	Fill in stagnant water (puddles)	Keep surroundings clean	Put mosquito screen on windows	Other	Don't know	
North Central												
FCT-Abuja	91.1	238	92.0	9.7	24.7	35.8	20.1	61.9	26.4	7.8	0.0	217
Benue	89.3	418	96.5	4.0	2.3	21.1	14.2	26.0	1.9	4.5	0.0	374
Kogi	78.3	251	54.8	10.2	19.6	47.4	27.6	39.0	3.3	1.5	0.0	196
Kwara	90.2	277	79.9	10.1	20.0	25.8	25.2	39.4	8.4	7.4	0.0	250
Nasarawa	80.6	358	87.6	9.9	7.3	23.5	8.7	23.5	1.2	1.0	0.0	289
Niger	43.7	537	87.6	14.0	6.5	13.9	4.9	14.9	3.1	2.4	0.3	234
Plateau	87.9	298	93.7	16.2	3.5	39.3	25.7	42.5	4.1	0.5	0.0	262
North East												
Adamawa	97.2	336	98.2	12.8	21.7	16.1	6.6	18.4	2.4	4.1	0.0	326
Bauchi	65.8	703	89.6	21.0	9.2	10.6	3.7	14.5	1.1	0.2	0.0	463
Borno	69.4	358	96.1	34.8	8.7	6.2	2.9	6.9	0.8	0.3	0.0	249
Gombe	83.1	279	91.3	20.9	4.4	7.0	0.0	17.1	1.1	0.0	0.0	232
Taraba	91.5	276	84.0	23.7	27.9	15.1	6.5	44.5	2.8	2.3	0.0	252
Yobe	87.1	447	97.9	33.4	10.0	14.1	11.3	22.2	3.8	0.0	0.0	390
North West												
Jigawa	77.4	566	92.3	13.3	6.7	4.5	3.6	24.9	2.6	0.7	0.2	438
Kaduna	70.8	690	81.3	26.7	6.2	7.9	20.3	32.9	5.6	5.6	1.0	489
Kano	93.6	920	96.8	26.3	10.3	17.0	6.1	17.6	7.3	0.3	0.0	861
Katsina	87.3	1,362	77.8	41.8	2.0	5.7	5.8	10.6	0.2	0.0	0.0	1,188
Kebbi	60.8	613	81.1	14.6	2.9	5.4	3.5	25.7	2.0	0.0	1.0	373
Sokoto	86.2	399	86.3	14.9	3.8	13.8	0.6	3.7	0.5	0.0	0.0	343
Zamfara	74.9	282	93.1	36.5	9.5	14.5	5.1	9.4	1.8	0.0	0.0	211
South East												
Abia	81.3	178	67.7	9.0	25.9	30.6	9.2	65.8	17.1	7.8	0.0	145
Anambra	98.5	283	85.3	25.9	28.6	16.7	20.5	72.2	32.3	0.7	0.0	279
Ebonyi	81.9	297	92.8	0.5	5.7	10.0	9.0	45.5	2.4	2.9	0.0	243
Enugu	91.5	204	91.0	1.0	5.2	6.8	2.6	41.7	8.8	0.0	0.2	187
Imo	75.7	149	65.2	10.8	9.9	17.9	8.4	51.9	8.3	4.5	0.5	113
South South												
Akwa Ibom	68.4	478	75.6	6.5	11.6	29.4	10.7	48.2	11.4	5.3	1.1	327
Bayelsa	56.0	131	72.2	15.3	11.1	22.4	12.0	35.0	3.4	17.0	0.0	73
Cross River	85.9	224	86.9	40.5	47.0	23.8	15.7	42.9	0.8	11.0	0.3	193
Delta	67.2	298	63.8	8.3	6.6	12.6	12.2	47.2	3.9	6.3	1.6	200
Edo	76.7	300	68.3	8.6	7.0	35.3	17.1	58.7	12.7	3.3	0.2	230
Rivers	76.2	304	80.1	21.8	10.5	23.0	23.1	43.1	10.6	4.9	0.2	232
South West												
Ekiti	94.9	123	86.4	34.2	14.1	48.6	17.7	48.7	12.8	1.8	0.0	116
Lagos	88.1	620	49.3	11.1	12.0	44.8	19.9	46.1	9.3	12.9	0.4	546
Ogun	86.2	308	67.2	21.8	8.6	7.0	6.4	40.9	0.8	1.1	0.0	265
Ondo	87.3	156	62.8	16.9	15.9	26.5	10.0	39.6	12.9	6.1	0.3	136
Osun	92.5	320	64.8	4.1	13.9	13.0	23.0	73.2	2.1	16.1	0.3	296
Oyo	98.3	497	91.7	33.9	16.7	35.6	34.9	60.8	22.6	0.0	0.0	488
Total	80.9	14,476	83.0	20.5	10.8	18.4	11.8	32.5	6.2	3.1	0.2	11,707

Note: More than one source may have been cited.
ITN = insecticide-treated net

Table 5.3.1 Malaria susceptibility, severity, and self-efficacy: National

Percentage of women age 15–49 who express specific perceptions about malaria susceptibility, percentage who express specific perceptions about the severity of malaria, and percentage who express specific perceptions about self-efficacy, according to background characteristics, Nigeria MIS 2021

Background characteristic	Perceived susceptibility			Perceived severity			Perceived self-efficacy			Number of women
	Percentage who disagree that people in the community get malaria only during the rainy season	Percentage who agree that when a child has a fever, they almost always worry it might be malaria	Percentage who perceive that their families and communities are at risk from malaria[1]	Percentage who disagree that getting malaria is not a problem because it can be easily treated	Percentage who disagree that only weak children can die from malaria	Percentage who feel that the consequences of malaria are serious[2]	Percentage who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes	Percentage who agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes	Percentage who are confident in their ability to perform specific malaria-related behaviours[3]	
Age										
15–19	20.9	77.0	84.0	41.1	48.7	59.7	83.8	74.9	87.5	2,793
20–24	21.0	82.7	89.2	38.2	49.9	57.9	86.3	77.1	89.6	2,464
25–29	21.3	84.6	90.2	38.0	51.7	60.7	86.1	77.7	89.4	2,660
30–34	23.5	83.5	89.8	37.8	50.4	60.1	84.2	76.1	88.0	2,362
35–39	26.5	82.0	89.5	37.0	52.4	61.3	83.9	77.0	86.9	1,964
40–44	25.7	81.2	90.6	36.5	48.8	59.2	82.9	73.5	86.4	1,420
45–49	26.1	82.9	91.2	34.5	49.1	56.8	83.9	76.6	86.7	814
Living children under age 5										
One or more	21.7	84.0	90.2	37.5	49.1	58.1	86.1	77.7	89.4	7,637
None	24.4	79.5	87.2	38.8	51.6	61.3	83.0	74.6	86.6	6,839
Residence										
Urban	24.7	82.0	89.2	35.1	54.1	61.7	84.7	76.6	87.7	4,641
Rural	22.1	81.8	88.6	39.6	48.5	58.7	84.6	76.1	88.2	9,835
Zone										
North Central	28.5	83.1	89.0	51.1	59.5	71.8	89.1	81.9	91.5	2,377
North East	8.3	85.8	88.1	37.4	41.3	53.3	86.9	80.3	91.0	2,399
North West	13.0	82.1	88.8	40.8	42.5	52.7	85.7	73.9	88.9	4,832
South East	33.0	72.5	83.3	42.5	69.2	76.9	81.5	74.7	85.2	1,111
South South	44.2	83.9	91.9	30.8	56.1	61.6	79.4	70.3	82.3	1,734
South West	33.9	78.5	89.5	21.3	53.1	58.2	80.6	76.3	85.0	2,023
Education										
No education[4]	14.5	81.8	87.7	39.5	42.2	52.9	84.6	74.1	88.8	5,156
Primary	21.9	82.4	88.8	38.1	50.7	59.9	85.1	77.6	88.1	2,089
Secondary	28.2	81.2	89.3	37.8	54.1	63.5	85.1	77.5	88.1	5,364
More than secondary	32.3	83.1	90.0	35.3	61.0	66.9	83.0	77.1	85.9	1,867
Wealth quintile										
Lowest	14.0	79.3	85.1	41.6	42.1	54.2	81.8	71.6	86.1	2,651
Second	14.5	83.1	88.6	39.4	44.6	55.2	86.6	76.9	90.4	2,730
Middle	24.3	83.9	90.9	39.7	50.1	59.8	87.4	79.2	90.7	2,799
Fourth	27.0	82.6	90.7	39.1	53.9	63.3	84.4	76.1	87.2	3,006
Highest	32.3	80.4	88.3	32.1	58.4	64.2	83.3	77.0	86.2	3,289
Total	22.9	81.8	88.8	38.1	50.3	59.6	84.7	76.2	88.1	14,476

[1] Includes women who disagree that people in the community get malaria only during the rainy season or agree that when a child has a fever, they almost always worry it might be malaria
[2] Includes women who disagree that getting malaria is not a problem because it can be easily treated or disagree that only weak children can die from malaria
[3] Includes women who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes or agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes
[4] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 5.3.2 Malaria susceptibility, severity, and self-efficacy: States

Percentage of women age 15–49 who express specific perceptions about malaria susceptibility, percentage who express specific perceptions about the severity of malaria, and percentage who express specific perceptions about self-efficacy, by state, Nigeria MIS 2021

	Perceived susceptibility			Perceived severity			Perceived self-efficacy			
State	Percentage who disagree that people in the community get malaria only during the rainy season	Percentage who agree that when a child has a fever, they almost always worry it might be malaria	Percentage who perceive that their families and communities are at risk from malaria[1]	Percentage who disagree that getting malaria is not a problem because it can be easily treated	Percentage who disagree that only weak children can die from malaria	Percentage who feel that the consequences of malaria are serious[2]	Percentage who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes	Percentage who agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes	Percentage who are confident in their ability to perform specific malaria-related behaviours[3]	Number of women
North Central										
FCT-Abuja	37.9	94.1	96.8	41.4	55.0	61.2	90.9	82.0	93.8	238
Benue	45.6	87.5	95.3	64.4	34.9	73.3	96.1	93.2	97.7	418
Kogi	33.4	80.2	83.2	51.6	82.7	87.2	78.4	78.6	81.9	251
Kwara	16.9	85.8	88.6	43.9	70.6	77.0	91.1	90.8	93.1	277
Nasarawa	29.6	75.0	82.7	59.0	65.9	71.2	85.3	75.8	86.5	358
Niger	19.3	79.7	88.1	43.0	57.0	66.7	87.6	72.6	92.0	537
Plateau	18.6	83.7	88.7	51.5	65.0	70.5	91.9	84.4	92.6	298
North East										
Adamawa	8.4	87.4	89.9	55.5	54.0	67.7	98.1	92.5	98.4	336
Bauchi	8.6	95.3	96.6	28.7	22.0	38.7	91.8	80.4	95.6	703
Borno	4.3	86.3	87.3	26.3	47.0	52.5	82.1	78.6	86.7	358
Gombe	7.1	91.1	93.7	24.3	36.4	43.3	90.3	87.3	95.5	279
Taraba	12.8	86.2	91.3	24.2	38.3	45.1	85.7	78.6	89.3	276
Yobe	8.8	65.7	68.6	62.6	62.5	77.3	73.5	68.8	79.9	447
North West										
Jigawa	4.2	93.1	95.5	10.9	16.5	20.0	90.3	84.5	93.2	566
Kaduna	14.5	90.4	93.7	25.8	37.9	48.8	94.8	84.5	96.3	690
Kano	4.9	93.0	93.7	46.2	48.8	50.5	95.2	90.0	97.0	920
Katsina	23.3	57.5	76.8	71.9	59.5	81.7	69.0	52.0	72.7	1,362
Kebbi	18.0	85.9	88.0	37.1	39.7	48.0	86.0	69.1	91.3	613
Sokoto	0.8	98.5	98.5	11.9	13.9	17.6	98.9	82.2	99.3	399
Zamfara	10.0	90.8	93.7	18.6	50.5	55.3	84.0	78.3	94.0	282
South East										
Abia	24.8	69.6	76.0	38.5	66.1	74.0	69.2	52.0	69.9	178
Anambra	20.2	61.8	75.5	45.9	67.5	75.5	79.3	77.3	85.3	283
Ebonyi	53.2	80.0	93.6	32.1	74.3	78.0	92.2	81.9	93.3	297
Enugu	18.0	72.4	78.1	51.4	77.8	85.8	79.9	79.3	88.7	204
Imo	47.5	81.6	93.7	49.2	53.9	68.9	81.5	76.4	82.5	149
South South										
Akwa Ibom	53.1	83.8	93.7	35.2	72.2	76.0	81.4	67.9	84.2	478
Bayelsa	52.7	86.2	94.4	21.9	46.9	54.1	73.6	60.2	77.1	131
Cross River	27.4	93.2	96.4	7.4	30.6	32.8	95.6	85.7	96.5	224
Delta	36.7	79.5	90.1	35.2	54.9	59.9	67.0	60.6	71.6	298
Edo	26.1	83.7	88.7	24.3	45.0	52.4	81.6	75.6	83.5	300
Rivers	64.0	80.3	89.4	47.1	65.6	74.3	77.1	71.2	80.3	304
South West										
Ekiti	45.2	80.1	94.5	17.9	39.8	46.9	79.0	73.0	80.6	123
Lagos	36.7	78.9	87.7	21.7	55.4	59.2	81.3	73.1	84.6	620
Ogun	28.9	70.2	84.4	36.7	66.6	76.0	57.7	60.1	67.3	308
Ondo	20.7	78.6	83.1	32.5	53.4	63.6	87.9	82.6	90.7	156
Osun	39.1	79.7	90.8	11.6	51.3	54.1	85.3	83.0	91.4	320
Oyo	31.4	82.1	94.8	14.8	46.2	49.9	89.0	85.0	91.8	497
Total	22.9	81.8	88.8	38.1	50.3	59.6	84.7	76.2	88.1	14,476

[1] Includes women who disagree that people in the community get malaria only during the rainy season or agree that when a child has a fever, they almost always worry it might be malaria

[2] Includes women who disagree that getting malaria is not a problem because it can be easily treated or disagree that only weak children can die from malaria

[3] Includes women who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes or agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes

Table 5.4.1 Attitudes towards malaria-related behaviours and malaria norms: National

Percentage of women age 15–49 who express specific attitudes regarding malaria-related behaviours, percentage with favourable attitudes towards specific malaria-related behaviours, percentage who express specific perceptions regarding community norms, and percentage who believe the majority of people in their community currently practise specific malaria-related behaviours, according to background characteristics, Nigeria MIS 2021

	Attitudes towards malaria-related behaviours				Perceptions of community norms			
Background characteristic	Percentage who disagree that they do not like sleeping under a mosquito net when the weather is too warm	Percentage who disagree that when a child has a fever, it is best to start giving the child any medicine that you have at home	Percentage who agree that it is important that children take the full dose of medicine that they are prescribed for malaria	Percentage who have a favourable attitude towards specific malaria-behaviours[1]	Percentage who agree that people in the community usually take their children to a health care provider on the same day or the day after they develop a fever	Percentage who agree that people in the community who have a mosquito net usually sleep under a mosquito net every night	Percentage who believe the majority of people in their community currently practise specific malaria-related behaviours[2]	Number of women
Age								
15–19	38.7	37.7	88.1	95.3	49.4	51.2	62.1	2,793
20–24	38.2	38.6	89.4	96.0	55.8	53.9	66.5	2,464
25–29	34.6	36.0	90.5	96.9	53.1	50.8	63.5	2,660
30–34	36.4	38.6	91.8	97.0	52.0	51.3	63.5	2,362
35–39	36.4	44.1	89.9	96.1	50.7	49.7	63.0	1,964
40–44	37.1	39.9	91.2	96.4	50.7	51.1	62.1	1,420
45–49	37.1	45.5	87.9	97.0	52.6	53.6	65.0	814
Living children under age 5								
One or more	35.8	35.3	90.5	96.5	54.9	54.4	65.8	7,637
None	38.2	43.7	89.3	96.1	48.9	48.3	61.2	6,839
Residence								
Urban	36.2	49.3	90.7	97.3	51.8	48.5	61.8	4,641
Rural	37.3	34.5	89.5	95.9	52.2	53.0	64.5	9,835
Zone								
North Central	34.5	49.4	91.2	95.6	47.4	45.2	59.0	2,377
North East	30.2	34.0	88.1	94.3	60.9	63.6	74.0	2,399
North West	40.2	18.1	90.6	96.7	60.8	64.7	74.8	4,832
South East	44.0	47.4	89.7	95.8	40.4	35.0	50.1	1,111
South South	40.5	62.5	92.6	97.8	41.3	31.0	48.9	1,734
South West	33.0	59.5	86.9	97.5	41.8	39.9	50.2	2,023
Education								
No education[3]	36.1	22.1	87.8	95.2	55.5	59.0	68.6	5,156
Primary	37.5	34.5	89.7	95.7	53.3	56.5	66.5	2,089
Secondary	38.6	49.4	90.6	97.0	49.8	47.2	60.5	5,364
More than secondary	33.9	62.3	93.8	98.1	47.9	37.9	55.7	1,867
Wealth quintile								
Lowest	34.6	23.4	86.3	94.0	50.6	57.1	66.4	2,651
Second	38.2	24.4	89.0	96.2	59.0	62.6	72.0	2,730
Middle	36.1	36.4	90.4	95.8	54.3	53.1	65.4	2,799
Fourth	38.8	44.4	90.7	96.9	50.7	47.7	60.8	3,006
Highest	36.7	62.0	92.5	98.1	46.9	40.0	55.5	3,289
Total	36.9	39.2	89.9	96.3	52.1	51.5	63.6	14,476

[1] Includes women who disagree that they do not like sleeping under a mosquito net when the weather is too warm, disagree that when a child has a fever it is best to start by giving the child any medicine they have at home, or agree that it is important that children take the full dose of medicine that they are prescribed for malaria

[2] Includes women who agree that people in the community usually take their children to a health care provider on the same day or day after they develop a fever or agree that people in the community who have a mosquito net usually sleep under a mosquito net every night

[3] No education includes informal education (adult education, Tsangaya, or Quranic).

Table 5.4.2 Attitudes towards malaria-related behaviours and malaria norms: States

Percentage of women age 15–49 who express specific attitudes regarding malaria-related behaviours, percentage with favourable attitudes towards specific malaria-related behaviours, percentage who express specific perceptions regarding community norms, and percentage who believe the majority of people in their community currently practise specific malaria-related behaviours, by state, Nigeria MIS 2021

	Attitudes towards malaria-related behaviours				Perceptions of community norms			
State	Percentage who disagree that they do not like sleeping under a mosquito net when the weather is too warm	Percentage who disagree that when a child has a fever, it is best to start giving the child any medicine that you have at home	Percentage who agree that it is important that children take the full dose of medicine that they are prescribed for malaria	Percentage who have a favourable attitude towards specific malaria-behaviours[1]	Percentage who agree that people in the community usually take their children to a health care provider on the same day or the day after they develop a fever	Percentage who agree that people in the community who have a mosquito net usually sleep under a mosquito net every night	Percentage who believe the majority of people in their community currently practise specific malaria-related behaviours[2]	Number of women
North Central								
FCT-Abuja	22.7	55.5	97.5	99.2	72.8	62.2	80.7	238
Benue	40.5	87.5	94.9	98.1	47.7	68.4	79.8	418
Kogi	42.4	57.1	95.8	99.0	47.5	31.0	54.2	251
Kwara	30.9	66.1	90.6	96.4	48.3	42.7	55.0	277
Nasarawa	43.5	31.5	85.4	89.7	47.2	39.1	51.2	358
Niger	36.2	19.2	87.0	94.0	48.1	47.5	59.8	537
Plateau	18.5	45.2	92.4	95.9	25.0	16.9	28.1	298
North East								
Adamawa	41.4	37.0	98.4	99.7	57.7	47.4	73.8	336
Bauchi	31.2	17.7	94.7	98.0	90.2	94.1	97.7	703
Borno	17.9	37.3	82.2	94.0	65.2	59.1	70.6	358
Gombe	19.7	49.1	94.8	98.4	42.4	52.3	62.0	279
Taraba	25.5	38.4	87.0	92.3	52.8	51.4	61.2	276
Yobe	39.6	42.4	71.0	83.4	30.1	46.1	54.9	447
North West								
Jigawa	26.0	11.7	91.1	94.2	84.9	85.2	91.4	566
Kaduna	33.3	28.4	95.1	99.3	62.5	58.2	70.9	690
Kano	38.6	9.9	91.0	96.4	72.9	71.6	77.5	920
Katsina	57.5	23.9	84.6	95.7	29.6	47.0	57.4	1,362
Kebbi	36.0	14.7	92.6	97.5	57.5	56.1	76.8	613
Sokoto	29.1	8.7	99.6	100.0	95.7	94.5	97.5	399
Zamfara	32.0	24.6	88.5	94.5	77.6	79.0	89.7	282
South East								
Abia	40.6	29.6	78.3	85.0	17.8	13.4	21.8	178
Anambra	52.5	64.0	94.6	98.9	41.5	39.2	49.7	283
Ebonyi	29.3	38.3	95.3	98.4	43.0	41.3	57.5	297
Enugu	58.4	59.9	80.7	94.6	58.7	50.4	71.1	204
Imo	41.5	38.4	94.9	99.6	35.2	18.8	40.7	149
South South								
Akwa Ibom	38.9	51.2	92.6	97.2	20.9	11.8	26.7	478
Bayelsa	40.5	55.7	88.5	95.7	24.0	30.3	40.8	131
Cross River	32.0	37.3	97.6	99.6	87.4	77.9	90.7	224
Delta	46.9	69.4	89.9	95.5	42.9	36.9	51.1	298
Edo	40.2	82.7	90.1	100.0	48.3	26.5	54.6	300
Rivers	43.2	75.0	95.8	98.3	38.5	25.4	48.6	304
South West								
Ekiti	47.1	38.1	92.3	98.9	35.3	36.7	44.6	123
Lagos	24.7	77.1	93.5	98.6	33.0	33.2	42.7	620
Ogun	32.2	35.4	67.7	95.7	35.1	37.2	47.9	308
Ondo	38.2	37.4	83.7	92.7	29.6	24.4	34.4	156
Osun	40.4	68.2	88.3	98.5	60.0	49.0	66.6	320
Oyo	33.8	59.1	89.3	97.7	50.6	49.9	56.8	497
Total	36.9	39.2	89.9	96.3	52.1	51.5	63.6	14,476

[1] Includes women who disagree that they do not like sleeping under a mosquito net when the weather is too warm, disagree that when a child has a fever it is best to start by giving the child any medicine they have at home, or agree that it is important that children take the full dose of medicine that they are prescribed for malaria

[2] Includes women who agree that people in the community usually take their children to a health care provider on the same day or day after they develop a fever or agree that people in the community who have a mosquito net usually sleep under a mosquito net every night

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SAMPLE DESIGN

Appendix A

A.1 INTRODUCTION

The 2021 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, for each of the six geographic zones, and for each of the country's 36 states and the Federal Capital Territory (FCT). Nigeria's geographic zones are as follows:

1. North Central: Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, and FCT
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

In addition, Bonny Island in Rivers State was oversampled, so the Bonny Island local government area (LGA) sample can be considered as representing a baseline survey to measure the impact of a planned project to transform the island to a malaria-free zone.

A.2 SAMPLE FRAME

The sampling frame used for the 2021 NMIS was the cartographic frame of the National Population Commission (NPC) for the proposed 2023 Population and Housing Census (PHC). Administratively, Nigeria is divided into states. Each state is subdivided into LGAs, each LGA is divided into wards, and wards are further subdivided into localities. In addition to these administrative units, localities are subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster for the 2021 NMIS, was defined on the basis of the EAs from the census frame for the proposed 2023 PHC.

Table A.1 shows the distribution of the population by state and by type of residence according to 2021 NPC population projections, and **Table A.2** shows the distribution of EAs and their average size by state and by type of residence according to the 2021 NPC Enumeration Area Demarcation (EAD) frame.

Table A.1 Population

Distribution of population in the sampling frame by state and residence, Nigeria MIS 2021

Zone/state		Population			Percentage	
		Urban	Rural	Total	States	Urban
North Central						
	Benue	2,049,701	5,906,447	7,956,148	2.84	25.76
	FCT Abuja	3,803,943	1,638,230	5,442,173	1.95	69.90
	Kogi	968,476	3,953,890	4,922,366	1.76	19.68
	Kwara	2,424,193	3,609,156	6,033,349	2.16	40.18
	Nasarawa	2,576,106	4,147,105	6,723,211	2.40	38.32
	Niger	2,427,225	7,089,852	9,517,077	3.40	25.50
	Plateau	1,603,184	6,843,895	8,447,079	3.02	18.98
North East						
	Adamawa	1,416,193	6,761,372	8,177,565	2.92	17.32
	Bauchi	1,356,791	9,292,281	10,649,072	3.81	12.74
	Borno	7,539,731	2,442,147	9,981,878	3.57	75.53
	Gombe	1,104,609	4,126,209	5,230,818	1.87	21.12
	Taraba	1,735,860	5,337,891	7,073,751	2.53	24.54
	Yobe	1,901,565	4,111,470	6,013,035	2.15	31.62
North West						
	Jigawa	1,118,997	8,664,934	9,783,931	3.50	11.44
	Kaduna	3,236,436	8,941,466	12,177,902	4.35	26.58
	Kano	5,967,549	13,249,718	19,217,267	6.87	31.05
	Katsina	2,681,399	9,943,671	12,625,070	4.51	21.24
	Kebbi	1,684,265	6,198,770	7,883,035	2.82	21.37
	Sokoto	1,108,476	6,734,780	7,843,256	2.80	14.13
	Zamfara	1,430,525	4,560,255	5,990,780	2.14	23.88
South East						
	Abia	1,241,297	4,285,410	5,526,707	1.98	22.46
	Anambra	905,295	5,918,322	6,823,617	2.44	13.27
	Ebonyi	241,624	4,828,993	5,070,617	1.81	4.77
	Enugu	2,362,150	4,184,761	6,546,911	2.34	36.08
	Imo	758,022	7,552,590	8,310,612	2.97	9.12
South South						
	Akwa Ibom	745,845	6,504,855	7,250,700	2.59	10.29
	Bayelsa	740,213	1,758,608	2,498,821	0.89	29.62
	Cross River	285,446	3,956,413	4,241,859	1.52	6.73
	Delta	3,137,171	3,901,367	7,038,538	2.52	44.57
	Edo	1,686,133	3,046,105	4,732,238	1.69	35.63
	Rivers	3,821,178	4,463,812	8,284,990	2.96	46.12
South West						
	Ekiti	1,072,362	1,707,979	2,780,341	0.99	38.57
	Lagos	7,059,007	4,104,995	11,164,002	3.99	63.23
	Ogun	3,434,212	4,009,314	7,443,526	2.66	46.14
	Ondo	3,422,248	1,192,481	4,614,729	1.65	74.16
	Osun	3,921,324	2,677,319	6,598,643	2.36	59.43
	Oyo	6,622,238	2,487,982	9,110,220	3.26	72.69
Nigeria		**89,590,989**	**190,134,845**	**279,725,834**	**100.00**	**32.03**

Source: NPC population projections, 2021

Table A.2 Enumeration areas and their average size

Distribution of enumeration areas and their average size in population by state and residence, Nigeria MIS 2021

Zone/state	Number of EAs			Average EA size		
	Urban	Rural	Total	Urban	Rural	Total
North Central						
Benue	3,894	11,257	15,151	526	525	525
FCT Abuja	7,399	3,230	10,629	514	507	512
Kogi	1,800	7,580	9,380	538	522	525
Kwara	4,521	6,930	11,451	536	521	527
Nasarawa	4,796	7,804	12,600	537	531	534
Niger	4,479	13,268	17,747	542	534	536
Plateau	2,949	13,051	16,000	544	524	528
North East						
Adamawa	2,612	12,290	14,902	542	550	549
Bauchi	2,556	17,334	19,890	531	536	535
Borno	14,351	4,515	18,866	525	541	529
Gombe	1,930	7,227	9,157	572	571	571
Taraba	3,461	10,748	14,209	502	497	498
Yobe	3,667	7,462	11,129	519	551	540
North West						
Jigawa	2,089	16,388	18,477	536	529	530
Kaduna	5,826	16,215	22,041	556	551	553
Kano	11,194	24,930	36,124	533	531	532
Katsina	5,078	18,964	24,042	528	524	525
Kebbi	3,271	11,585	14,856	515	535	531
Sokoto	2,093	12,624	14,717	530	533	533
Zamfara	2,630	8,545	11,175	544	534	536
South East						
Abia	2,339	8,042	10,381	531	533	532
Anambra	1,709	11,192	12,901	530	529	529
Ebonyi	,449	9,147	9,596	538	528	528
Enugu	4,446	7,882	12,328	531	531	531
Imo	1,407	14,143	15,550	539	534	534
South South						
Akwa Ibom	1,291	12,172	13,463	578	534	539
Bayelsa	1,448	3,411	4,859	511	516	514
Cross River	503	7,374	7,877	567	537	539
Delta	5,879	7,490	13,369	534	521	526
Edo	3,251	5,907	9,158	519	516	517
Rivers	7,258	8,269	15,527	526	540	534
South West						
Ekiti	2,036	3,380	5,416	527	505	513
Lagos	13,631	7,888	21,519	518	520	519
Ogun	6,609	7,768	14,377	520	516	518
Ondo	6,417	2,396	8,813	533	498	524
Osun	7,349	4,997	12,346	534	536	534
Oyo	11,888	4,873	16,761	557	511	544
Nigeria	**168,506**	**358,278**	**526,784**	**532**	**531**	**531**

Source: NPC-EAD frame, 2021

A.3 SAMPLE DESIGN AND IMPLEMENTATION

The sample for the 2021 NMIS was a stratified sample selected in two stages. Stratification was achieved by separating each of the 36 states and the Federal Capital Territory into urban and rural areas. In total, there were 73 sampling strata since there are no rural areas in Lagos. Samples were selected independently in every stratum through a two-stage selection. Implicit stratification was achieved at each of the lower administrative levels by sorting the sampling frame before sample selection according to administrative order and by using probability proportional to size selection in the first stage's sampling.

In the first stage, 568 EAs were selected with probability proportional to EA size. 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 a sampling frame for the selection of households in the second stage. In the second stage's selection, a fixed number of 25 households were selected in every cluster via equal probability systematic sampling.

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 and children tested for malaria by urban and rural residence for each state and each geographic zone.

The sample size for Bonny Island was calculated to be able to measure a decline in rapid diagnostic test (RDT) malaria prevalence from 22.3% (the prevalence in Rivers State according to the 2018 NDHS) to zero. A total of 25 clusters were selected from Rivers State, with eight clusters selected from Bonny Island and the remaining 17 from the other LGAs in the state.

Table A.3 Sample allocation of clusters and households

Sample allocation of clusters and households by state and residence, Nigeria MIS 2021

Zone/state	Allocation of clusters			Allocation of households		
	Urban	Rural	Total	Urban	Rural	Total
North Central	**35**	**66**	**101**	**875**	**1,650**	**2,525**
Benue	4	12	16	100	300	400
FCT Abuja	8	4	12	200	100	300
Kogi	4	11	15	100	275	375
Kwara	6	8	14	150	200	350
Nasarawa	4	9	13	100	225	325
Niger	4	12	16	100	300	400
Plateau	5	10	15	125	250	375
North East	**29**	**60**	**89**	**725**	**1,500**	**2,225**
Adamawa	4	11	15	100	275	375
Bauchi	3	13	16	75	325	400
Borno	12	4	16	300	100	400
Gombe	4	10	14	100	250	350
Taraba	3	11	14	75	275	350
Yobe	3	11	14	75	275	350
North West	**25**	**88**	**113**	**625**	**2,200**	**2,825**
Jigawa	2	14	16	50	350	400
Kaduna	5	12	17	125	300	425
Kano	5	13	18	125	325	450
Katsina	4	13	17	100	325	425
Kebbi	3	12	15	75	300	375
Sokoto	3	12	15	75	300	375
Zamfara	3	12	15	75	300	375
South East	**17**	**57**	**74**	**425**	**1,425**	**1,850**
Abia	3	11	14	75	275	350
Anambra	4	12	16	100	300	400
Ebonyi	2	11	13	50	275	325
Enugu	6	9	15	150	225	375
Imo	2	14	16	50	350	400
South South	**33**	**66**	**99**	**825**	**1650**	**2,475**
Akwa Ibom	2	13	15	50	325	375
Bayelsa	4	9	13	100	225	325
Cross River	3	12	15	75	300	375
Delta	7	9	16	175	225	400
Edo	5	10	15	125	250	375
Rivers	12[a]	13[a]	25[b]	300	325	625
South West	**56**	**36**	**92**	**1,400**	**900**	**2,300**
Ekiti	5	9	14	125	225	350
Lagos	12	6	18	300	150	450
Ogun	7	8	15	175	200	375
Ondo	12	3	15	300	75	375
Osun	9	6	15	225	150	375
Oyo	11	4	15	275	100	375
Nigeria	**195**	**373**	**568**	**4,875**	**9,325**	**14,200**

[a] Including 4 clusters from Bonny Island
[b] Including 8 clusters from Bonny Island

Table A.4 Sample allocation of expected completed interviews with women and children tested for malaria

Sample allocation of expected completed interviews with women and tested children by state and residence, Nigeria MIS 2021

Zone/state		Women			Tested children		
		Urban	Rural	Total	Urban	Rural	Total
North Central		**877**	**1,655**	**2,532**	**725**	**1,365**	**2,090**
	Benue	100	301	401	83	248	331
	FCT Abuja	201	100	301	166	83	249
	Kogi	100	276	376	83	227	310
	Kwara	151	201	352	124	166	290
	Nasarawa	100	225	325	83	186	269
	Niger	100	301	401	83	248	331
	Plateau	125	251	376	103	207	310
North East		**726**	**1,505**	**2,231**	**600**	**1,240**	**1,840**
	Adamawa	100	276	376	83	227	310
	Bauchi	75	326	401	62	269	331
	Borno	301	100	401	248	83	331
	Gombe	100	251	351	83	207	290
	Taraba	75	276	351	62	227	289
	Yobe	75	276	351	62	227	289
North West		**626**	**2,207**	**2,833**	**517**	**1,819**	**2,336**
	Jigawa	51	351	402	42	289	331
	Kaduna	125	301	426	103	248	351
	Kano	125	326	451	103	269	372
	Katsina	100	326	426	83	269	352
	Kebbi	75	301	376	62	248	310
	Sokoto	75	301	376	62	248	310
	Zamfara	75	301	376	62	248	310
South East		**428**	**1,429**	**1,857**	**353**	**1,177**	**1,530**
	Abia	75	276	351	62	227	289
	Anambra	100	301	401	83	248	331
	Ebonyi	51	276	327	42	227	269
	Enugu	151	225	376	124	186	310
	Imo	51	351	402	42	289	331
South South		**828**	**1,654**	**2,482**	**683**	**1,365**	**2,048**
	Akwa Ibom	51	326	377	42	269	311
	Bayelsa	100	225	325	83	186	269
	Cross River	75	301	376	62	248	310
	Delta	176	225	401	145	186	331
	Edo	125	251	376	103	207	310
	Rivers	301	326	627	248	269	517
South West		**1,404**	**903**	**2,307**	**1,157**	**745**	**1,902**
	Ekiti	125	225	350	103	186	289
	Lagos	301	151	452	248	124	372
	Ogun	176	201	377	145	166	311
	Ondo	301	75	376	248	62	310
	Osun	225	151	376	186	124	310
	Oyo	276	100	376	227	83	310
Nigeria		**4,889**	**9,353**	**14,242**	**4,035**	**7,711**	**11,746**

The above sample allocation was calculated based on data from the 2018 Nigeria Demographic and Health Survey (NDHS): the average number of women age 15–49 per household was 1.04, and the average number of children age 5–59 months per household was 0.86. The household completion rate was 97%, the women's response rate was 99%, and the children's response rate was about 96% for both RDT and microscopy.

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 2021 NMIS data to ensure the actual representativeness of the survey results at the national level as well as the domain level. Since the 2021 NMIS sample was 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. The following notations are used:

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} the number of households according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ 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 relative to the total number of households in 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, design weights were adjusted for household nonresponse as well as for individual nonresponse to calculate the sampling weights for households and for women. Differences in the household sampling weights and the individual sampling weights were introduced by individual nonresponse. The final sampling weights were normalised to obtain the total number of unweighted cases equal to the total number of weighted cases at the national level, for both household weights and individual weights. The normalised weights are relative weights that are valid for estimating means, proportions, and ratios but not valid for estimating population totals or for pooled data.

A.5 SURVEY IMPLEMENTATION

An examination of response rates for the 2021 NMIS indicates that the survey was successfully implemented. **Table A.5** presents interview completion rates for households and individual women in the 2021 NMIS by residence and zone.

Table A.5 Sample implementation

Percent distribution of households and eligible women age 15–49 by results of the household and individual interviews, and household, eligible women, and overall women response rates, according to residence and zone (unweighted), Nigeria MIS 2021

	Residence		Zone						
Result	Urban	Rural	North Central	North East	North West	South East	South South	South West	Total
Selected households									
Completed (C)	96.2	97.1	96.8	97.7	96.6	97.5	97.1	95.1	96.8
Household present but no competent respondent at home (HP)	0.1	0.3	0.4	0.2	0.2	0.1	0.5	0.0	0.2
Refused (R)	1.1	0.6	0.3	0.7	0.5	0.8	1.9	0.7	0.8
Dwelling not found (DNF)	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1
Household absent (HA)	0.9	1.4	1.9	0.7	1.7	1.1	0.3	1.5	1.2
Dwelling vacant/address not a dwelling (DV)	1.5	0.4	0.4	0.4	0.8	0.5	0.2	2.5	0.8
Dwelling destroyed (DD)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Other (O)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	4,876	9,309	2,529	2,225	2,801	1,855	2,475	2,300	14,185
Household response rate (HRR)[1]	98.7	98.9	99.1	98.9	99.1	99.1	97.6	99.3	98.8
Eligible women									
Completed (EWC)	98.7	98.9	98.8	96.9	99.6	99.3	98.8	99.8	98.8
Not at home (EWNH)	0.9	0.7	0.8	2.4	0.1	0.3	0.9	0.1	0.8
Postponed (EWP)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Refused (EWR)	0.3	0.2	0.2	0.6	0.1	0.3	0.3	0.1	0.3
Incapacitated (EWI)	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.1
Other (EWO)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	4,993	9,654	2,707	2,605	3,649	1,534	2,175	1,977	14,647
Eligible women response rate (EWRR)[2]	98.7	98.9	98.8	96.9	99.6	99.3	98.8	99.8	98.8
Overall women response rate (OWRR)[3]	97.4	97.8	97.9	95.8	98.7	98.4	96.4	99.1	97.7

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

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

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

$$OWRR = HRR * EWRR/100$$

ESTIMATES OF SAMPLING ERRORS

Appendix B

The estimates from a sample survey are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and in 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, or incorrect data entry. Although numerous efforts were made during the implementation of the 2021 Nigeria Malaria Indicator Survey (NMIS) to minimise this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2021 NMIS is only one of many samples that could have been selected from the same population, using the same design and expected sample size. Each of these samples would yield results that differ somewhat from the results of the selected sample. Sampling errors are a measure of the variability among all possible samples. Although the exact degree of variability is unknown, 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, and so on), 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% 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 2021 NMIS sample was the result of a multistage stratified design, and, consequently, it was necessary to use more complex formulas. Sampling errors are computed via SAS programmes developed by ICF. These programmes use the Taylor linearisation method to estimate variances for estimated means, proportions, and ratios. The Jackknife repeated replication method is used for variance estimation of more complex statistics such as fertility and mortality rates.

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

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

in which

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

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

In addition to the standard error, 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 2021 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, for each of the zones, and for each state. 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.48** 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% confidence limits (R±2SE) for each variable. The DEFT is 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 child had fever in last 2 weeks can be interpreted as follows: the overall average from the national sample is 0.365, and its standard error is 0.009. Therefore, to obtain the 95% confidence limits, one adds and subtracts twice the standard error to the sample estimate, that is, $0.365 \pm 2 \times 0.009$. There is a high probability (95%) that the true proportion of children who had a fever in the last 2 weeks is between 0.347 and 0.383.

For the total sample, the value of the DEFT, averaged over all variables, is 1.89. This means that, due to multistage clustering of the sample, the average standard error is increased by a factor of 1.89 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Nigeria MIS 2021

Variable	Estimate	Base population
HOUSEHOLDS		
Ownership of at least one mosquito net	Proportion	Households
Average number of mosquito nets per household	Mean	Households
Ownership of at least one ITN	Proportion	Households
Average number of ITNs per household	Mean	Households
Ownership of at least one ITN for every two persons	Proportion	Households
WOMEN		
No education	Proportion	All women 15–49
Secondary education or higher	Proportion	All women 15–49
Literate	Proportion	All women 15–49
CHILDREN		
Slept under any mosquito net last night	Proportion	Children under 5
Slept under an ITN last night	Proportion	Children under 5
Slept under an ITN last night in households with at least one ITN	Proportion	Children under 5 in households with at least one ITN
Had fever in last 2 weeks	Proportion	Children under 5 in women's birth history
Sought care/treatment from a health facility	Proportion	Children under 5 with a fever in the last 2 weeks
Took ACT	Proportion	Child under 5 with a fever in the last 2 weeks who received any antimalarial drugs
Has anaemia (haemoglobin <8.0 g/dl)	Proportion	Children 6–59 months tested for anaemia
Has malaria (based on rapid test)	Proportion	Children 6–59 months tested for malaria (rapid test)
Has malaria (based on microscopy test)	Proportion	Children 6–59 months tested for malaria (microscopy)
PREGNANT WOMEN		
Slept under any mosquito net last night	Proportion	All pregnant women 15–49
Slept under an ITN last night	Proportion	All pregnant women 15–49
Slept under an ITN last night in households with at least one ITN	Proportion	Pregnant women 15–49 in households with at least one ITN
Received 1+ doses of SP/Fansidar	Proportion	Last birth of women 15–49 with live births in the last 2 years
Received 2+ doses of SP/Fansidar	Proportion	Last birth of women 15–49 with live births in the last 2 years
Received 3+ doses of SP/Fansidar	Proportion	Last birth of women 15–49 with live births in the last 2 years

Table B.2 Sampling errors: Total sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.577	0.009	13,727	13,727	2.077	0.015	0.560	0.595
Average number of mosquito nets per household	1.363	0.028	13,727	13,727	2.034	0.020	1.307	1.418
Ownership of at least one ITN	0.560	0.009	13,727	13,727	2.071	0.016	0.542	0.577
Average number of ITNs per household	1.318	0.027	13,727	13,727	2.025	0.021	1.263	1.373
Ownership of at least one ITN for two persons	0.254	0.007	13,678	13,675	1.777	0.026	0.241	0.267
WOMEN								
No education	0.356	0.013	14,476	14,476	3.190	0.036	0.331	0.382
Secondary education or higher	0.499	0.013	14,476	14,476	3.224	0.027	0.473	0.526
Literate	0.561	0.013	14,476	14,476	3.113	0.023	0.535	0.586
CHILDREN								
Slept under any mosquito net last night	0.423	0.010	12,168	12,742	1.749	0.024	0.403	0.444
Slept under an ITN last night	0.412	0.010	12,168	12,742	1.750	0.025	0.391	0.432
Slept under an ITN last night in households with at least one ITN	0.643	0.010	7,438	8,159	1.526	0.016	0.622	0.664
Had fever in last 2 weeks	0.365	0.009	10,645	10,805	1.673	0.024	0.348	0.383
Sought care/treatment from a health facility	0.628	0.014	3,732	3,947	1.679	0.023	0.600	0.657
Took ACT	0.741	0.022	844	796	1.307	0.030	0.696	0.785
Has anaemia (haemoglobin <8.0 g/dl)	0.080	0.004	10,690	11,100	1.562	0.053	0.071	0.088
Has malaria (based on rapid test)	0.396	0.012	10,693	11,103	2.239	0.031	0.372	0.421
Has malaria (based on microscopy test)	0.223	0.010	10,631	11,037	2.116	0.043	0.203	0.242
PREGNANT WOMEN								
Slept under any mosquito net last night	0.504	0.019	1,192	1,320	1.324	0.037	0.467	0.542
Slept under an ITN last night	0.496	0.019	1,192	1,320	1.327	0.038	0.459	0.534
Slept under an ITN last night in households with at least one ITN	0.732	0.019	773	895	1.240	0.026	0.694	0.769
Received 1+ doses of SP/Fansidar	0.589	0.013	3,928	4,087	1.680	0.022	0.563	0.615
Received 2+ doses of SP/Fansidar	0.459	0.012	3,928	4,087	1.530	0.026	0.435	0.483
Received 3+ doses of SP/Fansidar	0.310	0.011	3,928	4,087	1.473	0.034	0.289	0.331

Table B.3 Sampling errors: Urban sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.552	0.014	4,690	4,546	1.965	0.026	0.523	0.580
Average number of mosquito nets per household	1.228	0.044	4,690	4,546	2.023	0.036	1.141	1.315
Ownership of at least one ITN	0.528	0.014	4,690	4,546	1.951	0.027	0.500	0.556
Average number of ITNs per household	1.169	0.041	4,690	4,546	1.953	0.035	1.086	1.252
Ownership of at least one ITN for two persons	0.238	0.011	4,665	4,521	1.724	0.045	0.216	0.259
WOMEN								
No education	0.190	0.017	4,930	4,641	3.105	0.091	0.155	0.225
Secondary education or higher	0.694	0.021	4,930	4,641	3.230	0.031	0.651	0.736
Literate	0.751	0.018	4,930	4,641	2.894	0.024	0.715	0.786
CHILDREN								
Slept under any mosquito net last night	0.387	0.018	3,622	3,545	1.730	0.047	0.350	0.424
Slept under an ITN last night	0.375	0.018	3,622	3,545	1.715	0.048	0.338	0.411
Slept under an ITN last night in households with at least one ITN	0.621	0.019	2,117	2,140	1.447	0.030	0.583	0.658
Had fever in last 2 weeks	0.313	0.013	3,196	3,050	1.449	0.042	0.287	0.339
Sought care/treatment from a health facility	0.642	0.030	952	955	1.804	0.046	0.582	0.702
Took ACT	0.738	0.029	262	243	0.994	0.039	0.681	0.796
Has anaemia (haemoglobin <8.0 g/dl)	0.048	0.005	3,100	3,005	1.260	0.105	0.038	0.058
Has malaria (based on rapid test)	0.250	0.017	3,101	3,006	1.867	0.067	0.217	0.284
Has malaria (based on microscopy test)	0.105	0.011	3,091	2,996	1.741	0.101	0.083	0.126
PREGNANT WOMEN								
Slept under any mosquito net last night	0.458	0.032	344	357	1.239	0.071	0.393	0.522
Slept under an ITN last night	0.441	0.032	344	357	1.228	0.072	0.377	0.505
Slept under an ITN last night in households with at least one ITN	0.677	0.037	208	233	1.221	0.054	0.603	0.750
Received 1+ doses of SP/Fansidar	0.721	0.017	1,201	1,162	1.350	0.024	0.687	0.756
Received 2+ doses of SP/Fansidar	0.575	0.018	1,201	1,162	1.300	0.032	0.538	0.612
Received 3+ doses of SP/Fansidar	0.386	0.018	1,201	1,162	1.327	0.048	0.349	0.423

Table B.4 Sampling errors: Rural sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.590	0.011	9,037	9,181	2.136	0.019	0.568	0.612
Average number of mosquito nets per household	1.430	0.035	9,037	9,181	2.037	0.025	1.359	1.501
Ownership of at least one ITN	0.575	0.011	9,037	9,181	2.135	0.019	0.553	0.597
Average number of ITNs per household	1.392	0.035	9,037	9,181	2.049	0.025	1.321	1.463
Ownership of at least one ITN for two persons	0.262	0.008	9,013	9,154	1.811	0.032	0.245	0.279
WOMEN								
No education	0.435	0.016	9,546	9,835	3.180	0.037	0.402	0.467
Secondary education or higher	0.408	0.016	9,546	9,835	3.147	0.039	0.376	0.440
Literate	0.471	0.016	9,546	9,835	3.105	0.034	0.439	0.503
CHILDREN								
Slept under any mosquito net last night	0.437	0.012	8,546	9,196	1.763	0.028	0.413	0.462
Slept under an ITN last night	0.426	0.012	8,546	9,196	1.768	0.029	0.401	0.451
Slept under an ITN last night in households with at least one ITN	0.651	0.012	5,321	6,019	1.560	0.019	0.626	0.676
Had fever in last 2 weeks	0.386	0.011	7,449	7,755	1.723	0.028	0.364	0.408
Sought care/treatment from a health facility	0.624	0.016	2,780	2,992	1.636	0.026	0.592	0.657
Took ACT	0.742	0.029	582	553	1.400	0.040	0.683	0.801
Has anaemia (haemoglobin <8.0 g/dl)	0.092	0.005	7,590	8,095	1.590	0.060	0.081	0.103
Has malaria (based on rapid test)	0.450	0.015	7,592	8,097	2.267	0.033	0.421	0.480
Has malaria (based on microscopy test)	0.267	0.012	7,540	8,041	2.091	0.044	0.243	0.290
PREGNANT WOMEN								
Slept under any mosquito net last night	0.522	0.023	848	963	1.350	0.043	0.476	0.567
Slept under an ITN last night	0.517	0.023	848	963	1.356	0.044	0.472	0.562
Slept under an ITN last night in households with at least one ITN	0.751	0.022	565	662	1.243	0.029	0.708	0.794
Received 1+ doses of SP/Fansidar	0.536	0.016	2,727	2,924	1.702	0.030	0.504	0.568
Received 2+ doses of SP/Fansidar	0.413	0.014	2,727	2,924	1.545	0.035	0.385	0.442
Received 3+ doses of SP/Fansidar	0.280	0.013	2,727	2,924	1.492	0.045	0.255	0.305

Table B.5 Sampling errors: North Central zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.518	0.022	2,447	2,210	2.220	0.043	0.473	0.562
Average number of mosquito nets per household	1.080	0.061	2,447	2,210	2.183	0.057	0.958	1.203
Ownership of at least one ITN	0.499	0.023	2,447	2,210	2.263	0.046	0.454	0.545
Average number of ITNs per household	1.043	0.062	2,447	2,210	2.216	0.059	0.920	1.167
Ownership of at least one ITN for two persons	0.203	0.016	2,436	2,202	1.916	0.077	0.171	0.234
WOMEN								
No education	0.327	0.026	2,674	2,377	2.828	0.079	0.275	0.378
Secondary education or higher	0.509	0.029	2,674	2,377	2.964	0.056	0.452	0.567
Literate	0.520	0.030	2,674	2,377	3.109	0.058	0.460	0.580
CHILDREN								
Slept under any mosquito net last night	0.319	0.025	2,388	2,212	1.922	0.079	0.269	0.369
Slept under an ITN last night	0.305	0.024	2,388	2,212	1.865	0.078	0.257	0.353
Slept under an ITN last night in households with at least one ITN	0.608	0.030	1,206	1,110	1.631	0.050	0.547	0.668
Had fever in last 2 weeks	0.269	0.023	2,024	1,803	2.058	0.085	0.224	0.315
Sought care/treatment from a health facility	0.683	0.036	486	485	1.617	0.052	0.612	0.754
Took ACT	0.794	0.047	183	162	1.437	0.059	0.701	0.887
Has anaemia (haemoglobin <8.0 g/dl)	0.045	0.006	2,091	1,915	1.354	0.142	0.032	0.057
Has malaria (based on rapid test)	0.323	0.025	2,092	1,916	2.052	0.076	0.274	0.372
Has malaria (based on microscopy test)	0.170	0.015	2,073	1,899	1.646	0.089	0.139	0.200
PREGNANT WOMEN								
Slept under any mosquito net last night	0.357	0.042	192	184	1.236	0.117	0.274	0.440
Slept under an ITN last night	0.351	0.042	192	184	1.251	0.120	0.267	0.435
Slept under an ITN last night in households with at least one ITN	0.608	0.052	109	106	1.157	0.086	0.504	0.712
Received 1+ doses of SP/Fansidar	0.570	0.030	795	716	1.717	0.053	0.510	0.630
Received 2+ doses of SP/Fansidar	0.481	0.027	795	716	1.510	0.055	0.428	0.535
Received 3+ doses of SP/Fansidar	0.355	0.025	795	716	1.505	0.072	0.304	0.405

Table B.6 Sampling errors: North East zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.741	0.017	2,173	2,089	1.807	0.023	0.707	0.775
Average number of mosquito nets per household	1.927	0.077	2,173	2,089	2.034	0.040	1.772	2.082
Ownership of at least one ITN	0.720	0.018	2,173	2,089	1.868	0.025	0.684	0.756
Average number of ITNs per household	1.859	0.074	2,173	2,089	1.961	0.040	1.710	2.007
Ownership of at least one ITN for two persons	0.329	0.018	2,170	2,085	1.788	0.055	0.293	0.365
WOMEN								
No education	0.576	0.040	2,523	2,399	4.024	0.069	0.497	0.656
Secondary education or higher	0.292	0.039	2,523	2,399	4.335	0.135	0.213	0.371
Literate	0.410	0.035	2,523	2,399	3.544	0.085	0.340	0.479
CHILDREN								
Slept under any mosquito net last night	0.530	0.024	2,329	2,264	1.758	0.046	0.482	0.579
Slept under an ITN last night	0.508	0.025	2,329	2,264	1.787	0.049	0.458	0.557
Slept under an ITN last night in households with at least one ITN	0.675	0.022	1,719	1,702	1.560	0.033	0.631	0.720
Had fever in last 2 weeks	0.358	0.020	1,976	1,910	1.629	0.055	0.319	0.398
Sought care/treatment from a health facility	0.543	0.042	659	684	2.020	0.077	0.459	0.627
Took ACT	0.807	0.052	143	151	1.584	0.065	0.703	0.912
Has anaemia (haemoglobin <8.0 g/dl)	0.095	0.010	2,045	1,991	1.586	0.110	0.074	0.116
Has malaria (based on rapid test)	0.430	0.030	2,045	1,991	2.349	0.069	0.371	0.489
Has malaria (based on microscopy test)	0.201	0.024	2,036	1,983	2.384	0.118	0.153	0.248
PREGNANT WOMEN								
Slept under any mosquito net last night	0.652	0.049	225	247	1.633	0.076	0.553	0.750
Slept under an ITN last night	0.650	0.049	225	247	1.631	0.076	0.552	0.749
Slept under an ITN last night in households with at least one ITN	0.842	0.031	179	191	1.219	0.037	0.779	0.905
Received 1+ doses of SP/Fansidar	0.545	0.032	690	690	1.707	0.058	0.482	0.608
Received 2+ doses of SP/Fansidar	0.402	0.027	690	690	1.466	0.066	0.349	0.455
Received 3+ doses of SP/Fansidar	0.273	0.025	690	690	1.520	0.092	0.222	0.323

Table B.7 Sampling errors: North West zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.776	0.015	2,707	3,629	1.816	0.019	0.747	0.805
Average number of mosquito nets per household	2.038	0.059	2,707	3,629	1.775	0.029	1.919	2.156
Ownership of at least one ITN	0.758	0.015	2,707	3,629	1.785	0.019	0.728	0.787
Average number of ITNs per household	1.987	0.059	2,707	3,629	1.760	0.030	1.869	2.105
Ownership of at least one ITN for two persons	0.311	0.015	2,704	3,624	1.727	0.049	0.280	0.342
WOMEN								
No education	0.556	0.025	3,635	4,832	2.983	0.044	0.507	0.605
Secondary education or higher	0.293	0.025	3,635	4,832	3.310	0.086	0.242	0.343
Literate	0.372	0.024	3,635	4,832	3.034	0.065	0.324	0.421
CHILDREN								
Slept under any mosquito net last night	0.555	0.016	3,381	4,618	1.449	0.029	0.522	0.587
Slept under an ITN last night	0.546	0.016	3,381	4,618	1.448	0.030	0.513	0.578
Slept under an ITN last night in households with at least one ITN	0.700	0.015	2,598	3,602	1.359	0.021	0.670	0.729
Had fever in last 2 weeks	0.455	0.016	3,043	3,976	1.597	0.036	0.423	0.488
Sought care/treatment from a health facility	0.656	0.022	1,481	1,810	1.599	0.034	0.611	0.700
Took ACT	0.580	0.059	94	113	1.058	0.101	0.463	0.697
Has anaemia (haemoglobin <8.0 g/dl)	0.117	0.009	2,927	3,966	1.370	0.073	0.100	0.134
Has malaria (based on rapid test)	0.516	0.023	2,928	3,967	2.147	0.044	0.470	0.561
Has malaria (based on microscopy test)	0.298	0.019	2,907	3,940	1.990	0.064	0.260	0.337
PREGNANT WOMEN								
Slept under any mosquito net last night	0.609	0.028	444	615	1.172	0.046	0.553	0.665
Slept under an ITN last night	0.595	0.028	444	615	1.168	0.047	0.539	0.651
Slept under an ITN last night in households with at least one ITN	0.783	0.026	335	467	1.109	0.033	0.732	0.834
Received 1+ doses of SP/Fansidar	0.565	0.024	1,173	1,528	1.651	0.043	0.517	0.614
Received 2+ doses of SP/Fansidar	0.408	0.021	1,173	1,528	1.457	0.052	0.366	0.450
Received 3+ doses of SP/Fansidar	0.301	0.019	1,173	1,528	1.397	0.063	0.263	0.339

Table B.8 Sampling errors: South East zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.369	0.016	1,808	1,356	1.422	0.044	0.337	0.401
Average number of mosquito nets per household	0.752	0.044	1,808	1,356	1.505	0.058	0.665	0.839
Ownership of at least one ITN	0.369	0.016	1,808	1,356	1.419	0.044	0.336	0.401
Average number of ITNs per household	0.748	0.043	1,808	1,356	1.500	0.058	0.661	0.834
Ownership of at least one ITN for two persons	0.186	0.013	1,797	1,349	1.455	0.072	0.160	0.213
WOMEN								
No education	0.028	0.006	1,523	1,111	1.398	0.211	0.016	0.040
Secondary education or higher	0.813	0.018	1,523	1,111	1.780	0.022	0.778	0.849
Literate	0.893	0.011	1,523	1,111	1.423	0.013	0.870	0.915
CHILDREN								
Slept under any mosquito net last night	0.295	0.027	1,271	994	1.591	0.092	0.240	0.349
Slept under an ITN last night	0.295	0.027	1,271	994	1.591	0.092	0.240	0.349
Slept under an ITN last night in households with at least one ITN	0.606	0.036	573	483	1.412	0.060	0.533	0.678
Had fever in last 2 weeks	0.325	0.022	1,162	864	1.380	0.068	0.281	0.369
Sought care/treatment from a health facility	0.782	0.027	387	281	1.183	0.035	0.728	0.837
Took ACT	0.705	0.057	195	146	1.438	0.081	0.591	0.819
Has anaemia (haemoglobin <8.0 g/dl)	0.042	0.007	1,149	901	1.134	0.171	0.028	0.057
Has malaria (based on rapid test)	0.273	0.030	1,150	902	2.030	0.110	0.213	0.333
Has malaria (based on microscopy test)	0.187	0.022	1,143	895	1.738	0.119	0.143	0.232
PREGNANT WOMEN								
Slept under any mosquito net last night	0.274	0.048	100	73	1.073	0.177	0.177	0.371
Slept under an ITN last night	0.274	0.048	100	73	1.073	0.177	0.177	0.371
Slept under an ITN last night in households with at least one ITN	0.669	0.081	36	30	1.051	0.121	0.507	0.831
Received 1+ doses of SP/Fansidar	0.805	0.025	383	284	1.230	0.031	0.756	0.855
Received 2+ doses of SP/Fansidar	0.727	0.027	383	284	1.201	0.037	0.672	0.781
Received 3+ doses of SP/Fansidar	0.412	0.030	383	284	1.198	0.073	0.352	0.472

Table B.9 Sampling errors: South South zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.400	0.019	2,404	2,037	1.931	0.048	0.361	0.438
Average number of mosquito nets per household	0.759	0.043	2,404	2,037	1.811	0.057	0.673	0.846
Ownership of at least one ITN	0.393	0.019	2,404	2,037	1.939	0.049	0.355	0.432
Average number of ITNs per household	0.745	0.043	2,404	2,037	1.828	0.058	0.659	0.832
Ownership of at least one ITN for two persons	0.192	0.014	2,400	2,034	1.695	0.071	0.164	0.219
WOMEN								
No education	0.068	0.009	2,148	1,734	1.689	0.135	0.050	0.086
Secondary education or higher	0.801	0.019	2,148	1,734	2.152	0.023	0.764	0.838
Literate	0.829	0.019	2,148	1,734	2.320	0.023	0.791	0.867
CHILDREN								
Slept under any mosquito net last night	0.240	0.022	1,621	1,357	1.526	0.091	0.196	0.284
Slept under an ITN last night	0.237	0.022	1,621	1,357	1.536	0.093	0.193	0.281
Slept under an ITN last night in households with at least one ITN	0.493	0.045	776	654	1.852	0.091	0.403	0.583
Had fever in last 2 weeks	0.372	0.021	1,396	1,120	1.433	0.057	0.330	0.414
Sought care/treatment from a health facility	0.511	0.038	489	416	1.518	0.075	0.435	0.587
Took ACT	0.777	0.044	137	108	1.155	0.056	0.689	0.864
Has anaemia (haemoglobin <8.0 g/dl)	0.042	0.008	1,438	1,196	1.446	0.200	0.025	0.058
Has malaria (based on rapid test)	0.299	0.030	1,438	1,196	2.059	0.101	0.239	0.360
Has malaria (based on microscopy test)	0.178	0.026	1,435	1,192	2.097	0.145	0.126	0.230
PREGNANT WOMEN								
Slept under any mosquito net last night	0.206	0.047	131	94	1.168	0.226	0.113	0.299
Slept under an ITN last night	0.206	0.047	131	94	1.168	0.226	0.113	0.299
Slept under an ITN last night in households with at least one ITN	0.469	0.084	61	41	1.140	0.178	0.302	0.636
Received 1+ doses of SP/Fansidar	0.610	0.031	474	403	1.427	0.051	0.548	0.673
Received 2+ doses of SP/Fansidar	0.490	0.032	474	403	1.430	0.065	0.426	0.554
Received 3+ doses of SP/Fansidar	0.293	0.032	474	403	1.573	0.110	0.229	0.357

Table B.10 Sampling errors: South West zone sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.459	0.022	2,188	2,406	2.066	0.048	0.414	0.503
Average number of mosquito nets per household	0.971	0.058	2,188	2,406	2.005	0.059	0.856	1.086
Ownership of at least one ITN	0.425	0.021	2,188	2,406	1.979	0.049	0.383	0.467
Average number of ITNs per household	0.899	0.053	2,188	2,406	1.895	0.059	0.793	1.005
Ownership of at least one ITN for two persons	0.241	0.015	2,171	2,381	1.664	0.063	0.210	0.271
WOMEN								
No education	0.080	0.014	1,973	2,023	2.301	0.176	0.052	0.108
Secondary education or higher	0.797	0.018	1,973	2,023	2.001	0.023	0.761	0.833
Literate	0.826	0.019	1,973	2,023	2.190	0.023	0.788	0.863
CHILDREN								
Slept under any mosquito net last night	0.237	0.022	1,178	1,296	1.518	0.095	0.192	0.282
Slept under an ITN last night	0.222	0.020	1,178	1,296	1.435	0.092	0.181	0.263
Slept under an ITN last night in households with at least one ITN	0.472	0.033	566	609	1.314	0.070	0.406	0.538
Had fever in last 2 weeks	0.239	0.019	1,044	1,133	1.397	0.080	0.201	0.277
Sought care/treatment from a health facility	0.586	0.037	230	270	1.165	0.064	0.511	0.660
Took ACT	0.747	0.047	92	115	1.132	0.063	0.653	0.841
Has anaemia (haemoglobin <8.0 g/dl)	0.053	0.009	1,040	1,131	1.255	0.176	0.035	0.072
Has malaria (based on rapid test)	0.241	0.026	1,040	1,131	1.651	0.107	0.189	0.293
Has malaria (based on microscopy test)	0.162	0.023	1,037	1,128	1.773	0.142	0.116	0.208
PREGNANT WOMEN								
Slept under any mosquito net last night	0.232	0.048	100	106	1.099	0.205	0.137	0.327
Slept under an ITN last night	0.228	0.047	100	106	1.105	0.208	0.133	0.323
Slept under an ITN last night in households with at least one ITN	0.409	0.078	53	59	1.165	0.191	0.253	0.565
Received 1+ doses of SP/Fansidar	0.611	0.029	413	465	1.267	0.047	0.553	0.669
Received 2+ doses of SP/Fansidar	0.488	0.031	413	465	1.317	0.063	0.426	0.549
Received 3+ doses of SP/Fansidar	0.279	0.027	413	465	1.283	0.097	0.225	0.333

Table B.11 Sampling errors: Sokoto state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.735	0.043	363	374	1.853	0.059	0.649	0.821
Average number of mosquito nets per household	1.694	0.134	363	374	1.600	0.079	1.426	1.962
Ownership of at least one ITN	0.685	0.043	363	374	1.758	0.063	0.599	0.771
Average number of ITNs per household	1.570	0.130	363	374	1.554	0.083	1.311	1.830
Ownership of at least one ITN for two persons	0.275	0.039	363	374	1.671	0.143	0.196	0.353
WOMEN								
No education	0.738	0.074	398	399	3.295	0.100	0.591	0.885
Secondary education or higher	0.151	0.066	398	399	3.636	0.439	0.018	0.284
Literate	0.217	0.073	398	399	3.501	0.339	0.070	0.364
CHILDREN								
Slept under any mosquito net last night	0.423	0.048	441	457	1.514	0.112	0.328	0.519
Slept under an ITN last night	0.400	0.049	441	457	1.576	0.123	0.301	0.498
Slept under an ITN last night in households with at least one ITN	0.550	0.051	324	332	1.400	0.092	0.449	0.651
Had fever in last 2 weeks	0.661	0.043	401	399	1.678	0.066	0.575	0.748
Sought care/treatment from a health facility	0.711	0.032	274	264	1.091	0.046	0.646	0.776
Took ACT	0.428	0.123	16	16	0.952	0.288	0.182	0.674
Has anaemia (haemoglobin <8.0 g/dl)	0.223	0.037	375	397	1.665	0.167	0.149	0.297
Has malaria (based on rapid test)	0.403	0.064	376	397	2.154	0.159	0.275	0.532
Has malaria (based on microscopy test)	0.359	0.058	372	395	2.090	0.162	0.243	0.476
PREGNANT WOMEN								
Slept under any mosquito net last night	0.453	0.058	46	50	0.818	0.129	0.337	0.570
Slept under an ITN last night	0.401	0.064	46	50	0.917	0.160	0.273	0.530
Slept under an ITN last night in households with at least one ITN	0.569	0.085	33	36	1.006	0.149	0.399	0.739
Received 1+ doses of SP/Fansidar	0.616	0.088	157	156	2.242	0.143	0.440	0.792
Received 2+ doses of SP/Fansidar	0.430	0.057	157	156	1.439	0.133	0.316	0.545
Received 3+ doses of SP/Fansidar	0.292	0.046	157	156	1.263	0.158	0.200	0.385

Table B.12 Sampling errors: Zamfara state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.676	0.057	338	214	2.220	0.084	0.562	0.790
Average number of mosquito nets per household	1.649	0.219	338	214	2.448	0.133	1.210	2.088
Ownership of at least one ITN	0.663	0.058	338	214	2.221	0.087	0.548	0.778
Average number of ITNs per household	1.601	0.212	338	214	2.394	0.132	1.177	2.025
Ownership of at least one ITN for two persons	0.261	0.054	337	212	2.239	0.207	0.153	0.369
WOMEN								
No education	0.712	0.095	439	282	4.300	0.133	0.522	0.902
Secondary education or higher	0.236	0.091	439	282	4.403	0.387	0.053	0.418
Literate	0.378	0.102	439	282	4.312	0.270	0.174	0.582
CHILDREN								
Slept under any mosquito net last night	0.462	0.055	390	238	1.558	0.120	0.352	0.573
Slept under an ITN last night	0.461	0.055	390	238	1.540	0.119	0.351	0.570
Slept under an ITN last night in households with at least one ITN	0.670	0.047	259	163	1.149	0.070	0.577	0.764
Had fever in last 2 weeks	0.471	0.034	361	211	1.155	0.072	0.403	0.538
Sought care/treatment from a health facility	0.517	0.070	164	100	1.658	0.134	0.378	0.656
Took ACT	0.518	0.096	28	20	1.032	0.185	0.326	0.711
Has anaemia (haemoglobin <8.0 g/dl)	0.160	0.027	358	216	1.297	0.168	0.106	0.215
Has malaria (based on rapid test)	0.597	0.064	358	216	2.074	0.107	0.469	0.725
Has malaria (based on microscopy test)	0.366	0.050	358	216	1.634	0.137	0.266	0.466
PREGNANT WOMEN								
Slept under any mosquito net last night	0.655	0.072	61	39	1.075	0.110	0.511	0.800
Slept under an ITN last night	0.569	0.060	61	39	0.884	0.106	0.448	0.690
Slept under an ITN last night in households with at least one ITN	0.748	0.082	45	30	1.073	0.110	0.584	0.913
Received 1+ doses of SP/Fansidar	0.400	0.087	144	83	2.001	0.217	0.226	0.573
Received 2+ doses of SP/Fansidar	0.306	0.096	144	83	2.353	0.314	0.114	0.498
Received 3+ doses of SP/Fansidar	0.273	0.101	144	83	2.548	0.369	0.072	0.474

Table B.13 Sampling errors: Katsina state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.649	0.042	419	871	1.804	0.065	0.565	0.734
Average number of mosquito nets per household	1.717	0.168	419	871	2.014	0.098	1.381	2.052
Ownership of at least one ITN	0.646	0.042	419	871	1.808	0.066	0.561	0.731
Average number of ITNs per household	1.706	0.168	419	871	2.019	0.099	1.370	2.043
Ownership of at least one ITN for two persons	0.189	0.027	419	871	1.400	0.142	0.135	0.242
WOMEN								
No education	0.579	0.046	662	1,362	2.400	0.080	0.487	0.672
Secondary education or higher	0.244	0.044	662	1,362	2.641	0.182	0.155	0.332
Literate	0.262	0.043	662	1,362	2.523	0.165	0.176	0.349
CHILDREN								
Slept under any mosquito net last night	0.481	0.035	533	1,139	1.244	0.074	0.410	0.552
Slept under an ITN last night	0.481	0.035	533	1,139	1.244	0.074	0.410	0.552
Slept under an ITN last night in households with at least one ITN	0.719	0.026	337	762	0.966	0.037	0.666	0.771
Had fever in last 2 weeks	0.296	0.023	490	1,000	0.977	0.079	0.250	0.343
Sought care/treatment from a health facility	0.805	0.028	145	296	0.783	0.035	0.749	0.861
Took ACT	1.000	0.000	7	12		0.000	1.000	1.000
Has anaemia (haemoglobin <8.0 g/dl)	0.133	0.024	452	961	1.426	0.177	0.086	0.181
Has malaria (based on rapid test)	0.495	0.049	452	961	1.913	0.098	0.397	0.592
Has malaria (based on microscopy test)	0.293	0.034	448	955	1.513	0.116	0.225	0.361
PREGNANT WOMEN								
Slept under any mosquito net last night	0.514	0.057	89	194	1.059	0.110	0.401	0.627
Slept under an ITN last night	0.514	0.057	89	194	1.059	0.110	0.401	0.627
Slept under an ITN last night in households with at least one ITN	0.809	0.048	53	123	0.862	0.059	0.714	0.905
Received 1+ doses of SP/Fansidar	0.418	0.044	183	373	1.207	0.106	0.330	0.507
Received 2+ doses of SP/Fansidar	0.370	0.040	183	373	1.111	0.108	0.290	0.450
Received 3+ doses of SP/Fansidar	0.302	0.026	183	373	0.749	0.085	0.251	0.353

Table B.14 Sampling errors: Jigawa state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.891	0.018	373	433	1.088	0.020	0.855	0.926
Average number of mosquito nets per household	2.583	0.184	373	433	1.885	0.071	2.215	2.952
Ownership of at least one ITN	0.885	0.017	373	433	1.021	0.019	0.851	0.918
Average number of ITNs per household	2.551	0.175	373	433	1.789	0.068	2.202	2.901
Ownership of at least one ITN for two persons	0.484	0.026	373	433	1.021	0.055	0.431	0.537
WOMEN								
No education	0.560	0.096	506	566	4.273	0.172	0.368	0.752
Secondary education or higher	0.331	0.106	506	566	4.931	0.319	0.120	0.543
Literate	0.411	0.103	506	566	4.614	0.251	0.205	0.617
CHILDREN								
Slept under any mosquito net last night	0.712	0.015	461	524	0.606	0.021	0.682	0.741
Slept under an ITN last night	0.701	0.019	461	524	0.749	0.027	0.663	0.738
Slept under an ITN last night in households with at least one ITN	0.753	0.022	429	488	0.913	0.029	0.709	0.797
Had fever in last 2 weeks	0.545	0.047	381	420	1.643	0.086	0.452	0.638
Sought care/treatment from a health facility	0.763	0.038	215	229	1.271	0.050	0.687	0.840
Took ACT	0.681	0.202	12	16	1.614	0.297	0.277	1.084
Has anaemia (haemoglobin <8.0 g/dl)	0.019	0.007	398	445	0.953	0.346	0.006	0.032
Has malaria (based on rapid test)	0.545	0.057	398	445	1.938	0.105	0.430	0.660
Has malaria (based on microscopy test)	0.254	0.048	396	443	1.770	0.190	0.158	0.350
PREGNANT WOMEN								
Slept under any mosquito net last night	0.860	0.051	49	57	1.055	0.060	0.758	0.963
Slept under an ITN last night	0.860	0.051	49	57	1.055	0.060	0.758	0.963
Slept under an ITN last night in households with at least one ITN	0.886	0.050	47	56	1.098	0.056	0.787	0.985
Received 1+ doses of SP/Fansidar	0.629	0.072	145	160	1.785	0.115	0.484	0.774
Received 2+ doses of SP/Fansidar	0.431	0.063	145	160	1.529	0.147	0.304	0.558
Received 3+ doses of SP/Fansidar	0.285	0.055	145	160	1.448	0.192	0.176	0.395

Table B.15 Sampling errors: Yobe state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.770	0.047	331	328	2.016	0.061	0.676	0.864
Average number of mosquito nets per household	1.959	0.262	331	328	2.606	0.134	1.436	2.483
Ownership of at least one ITN	0.764	0.047	331	328	2.007	0.062	0.669	0.858
Average number of ITNs per household	1.930	0.249	331	328	2.497	0.129	1.432	2.429
Ownership of at least one ITN for two persons	0.298	0.040	331	328	1.604	0.136	0.217	0.379
WOMEN								
No education	0.672	0.109	464	447	4.855	0.162	0.455	0.889
Secondary education or higher	0.272	0.114	464	447	5.337	0.419	0.044	0.499
Literate	0.504	0.086	464	447	3.672	0.172	0.331	0.677
CHILDREN								
Slept under any mosquito net last night	0.413	0.068	399	385	2.010	0.165	0.277	0.550
Slept under an ITN last night	0.407	0.068	399	385	1.989	0.167	0.271	0.543
Slept under an ITN last night in households with at least one ITN	0.531	0.071	308	296	1.822	0.133	0.389	0.672
Had fever in last 2 weeks	0.465	0.036	364	350	1.328	0.078	0.392	0.537
Sought care/treatment from a health facility	0.453	0.061	172	163	1.492	0.136	0.330	0.575
Took ACT	0.553	0.135	28	26	1.253	0.245	0.282	0.823
Has anaemia (haemoglobin <8.0 g/dl)	0.102	0.016	373	356	1.027	0.161	0.069	0.135
Has malaria (based on rapid test)	0.625	0.042	373	356	1.551	0.068	0.540	0.710
Has malaria (based on microscopy test)	0.205	0.069	371	354	2.959	0.337	0.067	0.343
PREGNANT WOMEN								
Slept under any mosquito net last night	0.593	0.115	60	67	1.894	0.194	0.363	0.823
Slept under an ITN last night	0.593	0.115	60	67	1.894	0.194	0.363	0.823
Slept under an ITN last night in households with at least one ITN	0.839	0.052	49	47	0.986	0.062	0.735	0.944
Received 1+ doses of SP/Fansidar	0.401	0.042	108	107	0.897	0.104	0.317	0.484
Received 2+ doses of SP/Fansidar	0.303	0.040	108	107	0.920	0.132	0.223	0.384
Received 3+ doses of SP/Fansidar	0.243	0.035	108	107	0.852	0.143	0.174	0.313

Table B.16 Sampling errors: Borno state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.523	0.058	399	339	2.298	0.111	0.407	0.638
Average number of mosquito nets per household	1.028	0.170	399	339	2.685	0.166	0.687	1.369
Ownership of at least one ITN	0.474	0.065	399	339	2.577	0.137	0.344	0.604
Average number of ITNs per household	0.948	0.178	399	339	2.816	0.188	0.591	1.304
Ownership of at least one ITN for two persons	0.089	0.021	399	339	1.491	0.240	0.046	0.131
WOMEN								
No education	0.675	0.056	420	358	2.453	0.084	0.562	0.788
Secondary education or higher	0.192	0.038	420	358	1.987	0.200	0.116	0.269
Literate	0.241	0.044	420	358	2.084	0.181	0.154	0.329
CHILDREN								
Slept under any mosquito net last night	0.417	0.068	406	367	2.305	0.164	0.281	0.554
Slept under an ITN last night	0.383	0.074	406	367	2.486	0.194	0.234	0.532
Slept under an ITN last night in households with at least one ITN	0.752	0.040	187	187	1.340	0.054	0.671	0.833
Had fever in last 2 weeks	0.202	0.033	317	291	1.386	0.163	0.136	0.268
Sought care/treatment from a health facility	0.481	0.092	60	59	1.417	0.192	0.296	0.665
Took ACT	1.000	0.000	2	2		0.000	1.000	1.000
Has anaemia (haemoglobin <8.0 g/dl)	0.057	0.014	343	305	1.150	0.252	0.028	0.085
Has malaria (based on rapid test)	0.186	0.044	343	305	2.091	0.236	0.098	0.274
Has malaria (based on microscopy test)	0.056	0.012	342	304	1.006	0.218	0.031	0.080
PREGNANT WOMEN								
Slept under any mosquito net last night	0.566	0.081	25	23	0.835	0.144	0.403	0.729
Slept under an ITN last night	0.553	0.079	25	23	0.807	0.143	0.395	0.711
Slept under an ITN last night in households with at least one ITN	0.841	0.095	14	15	1.092	0.113	0.650	1.032
Received 1+ doses of SP/Fansidar	0.787	0.041	101	88	1.026	0.052	0.705	0.870
Received 2+ doses of SP/Fansidar	0.613	0.050	101	88	1.040	0.081	0.513	0.712
Received 3+ doses of SP/Fansidar	0.415	0.049	101	88	1.006	0.118	0.318	0.513

Table B.17 Sampling errors: Adamawa state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.902	0.031	362	334	1.972	0.034	0.840	0.964
Average number of mosquito nets per household	2.357	0.166	362	334	2.111	0.070	2.025	2.689
Ownership of at least one ITN	0.902	0.031	362	334	1.972	0.034	0.840	0.964
Average number of ITNs per household	2.344	0.164	362	334	2.100	0.070	2.017	2.672
Ownership of at least one ITN for two persons	0.559	0.062	362	334	2.373	0.112	0.434	0.684
WOMEN								
No education	0.397	0.068	387	336	2.695	0.170	0.262	0.533
Secondary education or higher	0.442	0.074	387	336	2.901	0.168	0.294	0.590
Literate	0.468	0.079	387	336	3.064	0.168	0.310	0.625
CHILDREN								
Slept under any mosquito net last night	0.781	0.041	292	274	1.318	0.053	0.698	0.863
Slept under an ITN last night	0.781	0.041	292	274	1.318	0.053	0.698	0.863
Slept under an ITN last night in households with at least one ITN	0.835	0.035	276	256	1.246	0.042	0.765	0.906
Had fever in last 2 weeks	0.232	0.051	270	244	1.847	0.220	0.130	0.334
Sought care/treatment from a health facility	0.656	0.056	61	57	0.854	0.085	0.544	0.768
Took ACT	1.000	0.000	17	15		0.000	1.000	1.000
Has anaemia (haemoglobin <8.0 g/dl)	0.049	0.021	260	244	1.649	0.436	0.006	0.092
Has malaria (based on rapid test)	0.280	0.059	260	244	1.864	0.212	0.161	0.398
Has malaria (based on microscopy test)	0.107	0.038	260	244	1.734	0.358	0.030	0.184
PREGNANT WOMEN								
Slept under any mosquito net last night	0.728	0.092	29	26	1.101	0.126	0.545	0.912
Slept under an ITN last night	0.728	0.092	29	26	1.101	0.126	0.545	0.912
Slept under an ITN last night in households with at least one ITN	0.861	0.063	25	22	0.892	0.073	0.735	0.987
Received 1+ doses of SP/Fansidar	0.775	0.071	107	96	1.795	0.092	0.632	0.917
Received 2+ doses of SP/Fansidar	0.539	0.082	107	96	1.731	0.152	0.375	0.703
Received 3+ doses of SP/Fansidar	0.419	0.083	107	96	1.762	0.198	0.254	0.585

Table B.18 Sampling errors: Gombe state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.821	0.056	337	239	2.660	0.068	0.708	0.933
Average number of mosquito nets per household	2.649	0.235	337	239	2.267	0.089	2.180	3.119
Ownership of at least one ITN	0.817	0.058	337	239	2.731	0.071	0.700	0.933
Average number of ITNs per household	2.635	0.239	337	239	2.301	0.091	2.156	3.114
Ownership of at least one ITN for two persons	0.440	0.038	337	239	1.403	0.086	0.364	0.516
WOMEN								
No education	0.512	0.123	365	279	4.557	0.240	0.266	0.757
Secondary education or higher	0.403	0.120	365	279	4.555	0.299	0.163	0.644
Literate	0.459	0.124	365	279	4.598	0.269	0.212	0.706
CHILDREN								
Slept under any mosquito net last night	0.652	0.058	333	232	1.791	0.088	0.537	0.767
Slept under an ITN last night	0.649	0.057	333	232	1.766	0.088	0.535	0.762
Slept under an ITN last night in households with at least one ITN	0.732	0.051	302	205	1.630	0.069	0.631	0.833
Had fever in last 2 weeks	0.217	0.041	236	172	1.378	0.190	0.134	0.299
Sought care/treatment from a health facility	0.564	0.094	57	37	1.222	0.166	0.376	0.751
Took ACT	0.224	0.137	9	5	0.830	0.610	0.000	0.497
Has anaemia (haemoglobin <8.0 g/dl)	0.112	0.038	264	182	1.777	0.340	0.036	0.188
Has malaria (based on rapid test)	0.331	0.080	264	182	2.268	0.241	0.172	0.490
Has malaria (based on microscopy test)	0.177	0.054	259	177	1.997	0.307	0.069	0.286
PREGNANT WOMEN								
Slept under any mosquito net last night	0.698	0.099	21	12	0.869	0.142	0.500	0.896
Slept under an ITN last night	0.698	0.099	21	12	0.869	0.142	0.500	0.896
Slept under an ITN last night in households with at least one ITN	0.818	0.090	19	10	0.867	0.110	0.638	0.998
Received 1+ doses of SP/Fansidar	0.572	0.087	87	66	1.640	0.153	0.397	0.747
Received 2+ doses of SP/Fansidar	0.433	0.075	87	66	1.411	0.174	0.282	0.583
Received 3+ doses of SP/Fansidar	0.267	0.058	87	66	1.220	0.217	0.151	0.383

Table B.19 Sampling errors: Bauchi state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.747	0.031	396	591	1.425	0.042	0.685	0.810
Average number of mosquito nets per household	2.048	0.134	396	591	1.383	0.066	1.779	2.316
Ownership of at least one ITN	0.727	0.035	396	591	1.560	0.048	0.657	0.798
Average number of ITNs per household	1.945	0.124	396	591	1.303	0.064	1.696	2.193
Ownership of at least one ITN for two persons	0.323	0.031	393	587	1.302	0.095	0.262	0.385
WOMEN								
No education	0.650	0.090	484	703	4.074	0.138	0.471	0.830
Secondary education or higher	0.195	0.076	484	703	4.138	0.389	0.043	0.346
Literate	0.336	0.069	484	703	3.185	0.206	0.197	0.474
CHILDREN								
Slept under any mosquito net last night	0.561	0.032	462	716	1.119	0.058	0.497	0.626
Slept under an ITN last night	0.527	0.039	462	716	1.306	0.074	0.449	0.605
Slept under an ITN last night in households with at least one ITN	0.673	0.028	348	561	0.977	0.041	0.617	0.728
Had fever in last 2 weeks	0.502	0.041	425	625	1.514	0.083	0.419	0.585
Sought care/treatment from a health facility	0.591	0.080	213	314	2.094	0.135	0.432	0.751
Took ACT	0.964	0.022	53	86	0.896	0.022	0.921	1.007
Has anaemia (haemoglobin <8.0 g/dl)	0.123	0.023	416	647	1.471	0.191	0.076	0.169
Has malaria (based on rapid test)	0.596	0.042	416	647	1.608	0.070	0.513	0.680
Has malaria (based on microscopy test)	0.317	0.036	416	647	1.488	0.114	0.245	0.389
PREGNANT WOMEN								
Slept under any mosquito net last night	0.711	0.068	59	99	1.179	0.096	0.575	0.847
Slept under an ITN last night	0.711	0.068	59	99	1.179	0.096	0.575	0.847
Slept under an ITN last night in households with at least one ITN	0.898	0.050	45	79	1.213	0.056	0.798	0.999
Received 1+ doses of SP/Fansidar	0.403	0.063	177	255	1.703	0.157	0.277	0.530
Received 2+ doses of SP/Fansidar	0.291	0.050	177	255	1.459	0.172	0.191	0.391
Received 3+ doses of SP/Fansidar	0.188	0.048	177	255	1.612	0.254	0.093	0.283

Table B.20 Sampling errors: Kano state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.868	0.022	438	683	1.341	0.025	0.825	0.912
Average number of mosquito nets per household	2.504	0.118	438	683	1.364	0.047	2.268	2.739
Ownership of at least one ITN	0.853	0.021	438	683	1.229	0.024	0.811	0.894
Average number of ITNs per household	2.469	0.114	438	683	1.316	0.046	2.241	2.697
Ownership of at least one ITN for two persons	0.387	0.033	438	683	1.433	0.086	0.320	0.454
WOMEN								
No education	0.491	0.047	620	920	2.334	0.096	0.397	0.586
Secondary education or higher	0.328	0.042	620	920	2.221	0.128	0.244	0.412
Literate	0.437	0.044	620	920	2.208	0.101	0.348	0.525
CHILDREN								
Slept under any mosquito net last night	0.648	0.046	613	971	1.825	0.071	0.557	0.740
Slept under an ITN last night	0.648	0.046	613	971	1.825	0.071	0.557	0.740
Slept under an ITN last night in households with at least one ITN	0.756	0.046	523	833	2.029	0.061	0.664	0.848
Had fever in last 2 weeks	0.309	0.043	531	802	1.909	0.138	0.224	0.394
Sought care/treatment from a health facility	0.445	0.063	165	248	1.488	0.141	0.320	0.570
Took ACT	0.685	0.123	15	26	1.118	0.180	0.439	0.932
Has anaemia (haemoglobin <8.0 g/dl)	0.122	0.012	531	838	0.826	0.098	0.098	0.146
Has malaria (based on rapid test)	0.540	0.047	531	838	1.953	0.087	0.446	0.635
Has malaria (based on microscopy test)	0.255	0.032	521	824	1.434	0.126	0.191	0.319
PREGNANT WOMEN								
Slept under any mosquito net last night	0.769	0.063	64	99	1.029	0.082	0.643	0.895
Slept under an ITN last night	0.769	0.063	64	99	1.029	0.082	0.643	0.895
Slept under an ITN last night in households with at least one ITN	0.930	0.031	51	82	0.878	0.033	0.867	0.992
Received 1+ doses of SP/Fansidar	0.763	0.050	194	296	1.643	0.065	0.664	0.862
Received 2+ doses of SP/Fansidar	0.484	0.044	194	296	1.236	0.091	0.396	0.571
Received 3+ doses of SP/Fansidar	0.326	0.053	194	296	1.598	0.163	0.219	0.432

Table B.21 Sampling errors: Kaduna state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.833	0.027	426	581	1.500	0.033	0.778	0.887
Average number of mosquito nets per household	2.167	0.135	426	581	1.638	0.062	1.897	2.436
Ownership of at least one ITN	0.823	0.030	426	581	1.603	0.036	0.763	0.882
Average number of ITNs per household	2.131	0.140	426	581	1.690	0.066	1.851	2.410
Ownership of at least one ITN for two persons	0.414	0.052	425	579	2.145	0.125	0.311	0.517
WOMEN								
No education	0.214	0.073	531	690	4.050	0.342	0.068	0.360
Secondary education or higher	0.591	0.082	531	690	3.770	0.138	0.428	0.754
Literate	0.629	0.070	531	690	3.302	0.111	0.489	0.769
CHILDREN								
Slept under any mosquito net last night	0.630	0.043	477	661	1.349	0.068	0.544	0.717
Slept under an ITN last night	0.624	0.043	477	661	1.353	0.069	0.538	0.711
Slept under an ITN last night in households with at least one ITN	0.742	0.030	401	556	1.119	0.040	0.683	0.801
Had fever in last 2 weeks	0.506	0.030	437	575	1.211	0.060	0.445	0.566
Sought care/treatment from a health facility	0.838	0.027	221	290	1.111	0.033	0.784	0.893
Took ACT	0.332	0.140	15	20	1.128	0.421	0.053	0.612
Has anaemia (haemoglobin <8.0 g/dl)	0.069	0.020	420	583	1.556	0.292	0.029	0.110
Has malaria (based on rapid test)	0.323	0.055	420	583	2.046	0.170	0.213	0.432
Has malaria (based on microscopy test)	0.162	0.035	419	582	1.752	0.216	0.092	0.232
PREGNANT WOMEN								
Slept under any mosquito net last night	0.608	0.074	68	95	1.252	0.121	0.460	0.755
Slept under an ITN last night	0.608	0.074	68	95	1.252	0.121	0.460	0.755
Slept under an ITN last night in households with at least one ITN	0.725	0.074	57	79	1.306	0.103	0.576	0.873
Received 1+ doses of SP/Fansidar	0.654	0.069	173	227	1.904	0.105	0.516	0.792
Received 2+ doses of SP/Fansidar	0.430	0.062	173	227	1.637	0.143	0.307	0.553
Received 3+ doses of SP/Fansidar	0.281	0.058	173	227	1.701	0.206	0.165	0.397

Table B.22 Sampling errors: Kebbi state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.781	0.046	350	474	2.091	0.060	0.688	0.874
Average number of mosquito nets per household	1.746	0.102	350	474	1.266	0.058	1.542	1.950
Ownership of at least one ITN	0.729	0.048	350	474	2.027	0.066	0.632	0.826
Average number of ITNs per household	1.621	0.107	350	474	1.337	0.066	1.406	1.836
Ownership of at least one ITN for two persons	0.195	0.023	349	471	1.070	0.116	0.150	0.241
WOMEN								
No education	0.793	0.047	479	613	2.547	0.060	0.698	0.888
Secondary education or higher	0.093	0.048	479	613	3.552	0.514	0.000	0.188
Literate	0.295	0.047	479	613	2.266	0.161	0.200	0.390
CHILDREN								
Slept under any mosquito net last night	0.462	0.051	466	629	1.678	0.110	0.360	0.564
Slept under an ITN last night	0.430	0.053	466	629	1.734	0.123	0.324	0.535
Slept under an ITN last night in households with at least one ITN	0.579	0.042	325	467	1.249	0.073	0.494	0.663
Had fever in last 2 weeks	0.673	0.025	442	569	1.124	0.037	0.622	0.723
Sought care/treatment from a health facility	0.471	0.060	297	383	1.842	0.127	0.351	0.591
Took ACT	0.000	0.000	1	2			0.000	0.000
Has anaemia (haemoglobin <8.0 g/dl)	0.116	0.022	393	526	1.271	0.187	0.073	0.160
Has malaria (based on rapid test)	0.756	0.056	393	526	2.239	0.074	0.645	0.867
Has malaria (based on microscopy test)	0.490	0.071	393	526	2.448	0.144	0.349	0.631
PREGNANT WOMEN								
Slept under any mosquito net last night	0.541	0.084	67	81	1.244	0.156	0.372	0.710
Slept under an ITN last night	0.506	0.086	67	81	1.257	0.169	0.335	0.678
Slept under an ITN last night in households with at least one ITN	0.661	0.089	49	62	1.182	0.134	0.483	0.838
Received 1+ doses of SP/Fansidar	0.445	0.057	177	234	1.544	0.128	0.331	0.558
Received 2+ doses of SP/Fansidar	0.358	0.059	177	234	1.649	0.164	0.241	0.476
Received 3+ doses of SP/Fansidar	0.314	0.050	177	234	1.445	0.159	0.214	0.413

Table B.23 Sampling errors: Niger state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.544	0.047	363	442	1.786	0.086	0.450	0.638
Average number of mosquito nets per household	1.248	0.176	363	442	2.123	0.141	0.897	1.600
Ownership of at least one ITN	0.533	0.045	363	442	1.721	0.085	0.443	0.624
Average number of ITNs per household	1.224	0.173	363	442	2.094	0.141	0.878	1.570
Ownership of at least one ITN for two persons	0.160	0.036	362	440	1.881	0.228	0.087	0.232
WOMEN								
No education	0.592	0.088	423	537	3.630	0.149	0.416	0.768
Secondary education or higher	0.258	0.093	423	537	4.262	0.360	0.072	0.443
Literate	0.241	0.101	423	537	4.717	0.418	0.039	0.443
CHILDREN								
Slept under any mosquito net last night	0.221	0.049	450	565	1.920	0.224	0.122	0.319
Slept under an ITN last night	0.214	0.047	450	565	1.862	0.221	0.119	0.308
Slept under an ITN last night in households with at least one ITN	0.417	0.075	253	290	1.821	0.181	0.266	0.567
Had fever in last 2 weeks	0.454	0.049	377	474	1.699	0.107	0.356	0.551
Sought care/treatment from a health facility	0.736	0.054	177	215	1.371	0.073	0.628	0.843
Took ACT	0.877	0.082	29	33	1.263	0.094	0.712	1.042
Has anaemia (haemoglobin <8.0 g/dl)	0.048	0.015	374	465	1.281	0.304	0.019	0.077
Has malaria (based on rapid test)	0.426	0.056	375	466	1.980	0.132	0.314	0.538
Has malaria (based on microscopy test)	0.207	0.040	363	454	1.710	0.193	0.127	0.287
PREGNANT WOMEN								
Slept under any mosquito net last night	0.307	0.071	44	53	1.018	0.232	0.165	0.450
Slept under an ITN last night	0.307	0.071	44	53	1.018	0.232	0.165	0.450
Slept under an ITN last night in households with at least one ITN	0.536	0.085	28	31	0.859	0.159	0.365	0.707
Received 1+ doses of SP/Fansidar	0.463	0.080	158	187	1.934	0.172	0.303	0.622
Received 2+ doses of SP/Fansidar	0.374	0.067	158	187	1.670	0.178	0.240	0.507
Received 3+ doses of SP/Fansidar	0.229	0.051	158	187	1.465	0.222	0.128	0.331

Table B.24 Sampling errors: FCT state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.482	0.040	294	202	1.353	0.082	0.403	0.561
Average number of mosquito nets per household	0.878	0.141	294	202	1.949	0.160	0.596	1.159
Ownership of at least one ITN	0.450	0.032	294	202	1.098	0.071	0.386	0.514
Average number of ITNs per household	0.787	0.110	294	202	1.611	0.140	0.566	1.007
Ownership of at least one ITN for two persons	0.124	0.023	290	198	1.188	0.186	0.078	0.170
WOMEN								
No education	0.177	0.054	359	238	2.628	0.301	0.070	0.284
Secondary education or higher	0.740	0.078	359	238	3.311	0.105	0.584	0.896
Literate	0.773	0.064	359	238	2.857	0.083	0.645	0.901
CHILDREN								
Slept under any mosquito net last night	0.482	0.095	281	196	2.127	0.196	0.293	0.672
Slept under an ITN last night	0.423	0.079	281	196	1.822	0.188	0.264	0.582
Slept under an ITN last night in households with at least one ITN	0.760	0.085	154	109	2.019	0.112	0.589	0.931
Had fever in last 2 weeks	0.292	0.041	268	177	1.366	0.139	0.211	0.374
Sought care/treatment from a health facility	0.777	0.035	71	52	0.754	0.045	0.707	0.848
Took ACT	0.924	0.047	40	28	1.133	0.051	0.831	1.018
Has anaemia (haemoglobin <8.0 g/dl)	0.064	0.016	243	171	0.959	0.244	0.033	0.095
Has malaria (based on rapid test)	0.346	0.051	243	171	1.293	0.148	0.243	0.448
Has malaria (based on microscopy test)	0.188	0.046	243	171	1.432	0.243	0.097	0.279
PREGNANT WOMEN								
Slept under any mosquito net last night	0.361	0.179	16	11	1.491	0.497	0.002	0.719
Slept under an ITN last night	0.361	0.179	16	11	1.491	0.497	0.002	0.719
Slept under an ITN last night in households with at least one ITN	0.460	0.207	12	9	1.471	0.450	0.046	0.875
Received 1+ doses of SP/Fansidar	0.674	0.047	98	66	1.008	0.070	0.579	0.769
Received 2+ doses of SP/Fansidar	0.593	0.044	98	66	0.886	0.074	0.505	0.680
Received 3+ doses of SP/Fansidar	0.359	0.058	98	66	1.204	0.161	0.243	0.475

Table B.25 Sampling errors: Nasarawa state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.369	0.044	323	290	1.638	0.120	0.281	0.458
Average number of mosquito nets per household	0.754	0.120	323	290	1.769	0.159	0.514	0.993
Ownership of at least one ITN	0.334	0.045	323	290	1.690	0.133	0.245	0.423
Average number of ITNs per household	0.694	0.118	323	290	1.780	0.170	0.458	0.930
Ownership of at least one ITN for two persons	0.114	0.034	322	290	1.886	0.294	0.047	0.181
WOMEN								
No education	0.449	0.054	420	358	2.217	0.120	0.341	0.558
Secondary education or higher	0.442	0.062	420	358	2.521	0.139	0.319	0.565
Literate	0.460	0.046	420	358	1.872	0.099	0.369	0.551
CHILDREN								
Slept under any mosquito net last night	0.151	0.039	480	427	1.738	0.259	0.073	0.229
Slept under an ITN last night	0.144	0.038	480	427	1.701	0.262	0.069	0.220
Slept under an ITN last night in households with at least one ITN	0.479	0.075	148	129	1.263	0.156	0.329	0.628
Had fever in last 2 weeks	0.146	0.030	360	303	1.424	0.206	0.086	0.206
Sought care/treatment from a health facility	0.524	0.111	51	44	1.390	0.212	0.302	0.745
Took ACT	0.824	0.112	26	21	1.193	0.136	0.601	1.047
Has anaemia (haemoglobin <8.0 g/dl)	0.012	0.006	452	402	1.075	0.526	0.000	0.025
Has malaria (based on rapid test)	0.299	0.055	452	402	1.959	0.182	0.190	0.409
Has malaria (based on microscopy test)	0.153	0.020	452	402	1.074	0.133	0.112	0.193
PREGNANT WOMEN								
Slept under any mosquito net last night	0.234	0.080	32	27	1.024	0.342	0.074	0.395
Slept under an ITN last night	0.195	0.085	32	27	1.163	0.437	0.025	0.365
Slept under an ITN last night in households with at least one ITN	0.430	0.150	14	12	1.111	0.348	0.131	0.729
Received 1+ doses of SP/Fansidar	0.626	0.068	143	123	1.689	0.109	0.489	0.763
Received 2+ doses of SP/Fansidar	0.511	0.058	143	123	1.386	0.113	0.395	0.627
Received 3+ doses of SP/Fansidar	0.438	0.057	143	123	1.368	0.129	0.325	0.551

Table B.26 Sampling errors: Plateau state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.395	0.077	375	311	2.997	0.194	0.242	0.548
Average number of mosquito nets per household	0.727	0.149	375	311	2.691	0.204	0.430	1.024
Ownership of at least one ITN	0.378	0.080	375	311	3.153	0.212	0.218	0.538
Average number of ITNs per household	0.676	0.160	375	311	3.072	0.237	0.356	0.997
Ownership of at least one ITN for two persons	0.151	0.050	371	309	2.681	0.333	0.050	0.252
WOMEN								
No education	0.391	0.079	367	298	3.071	0.203	0.233	0.550
Secondary education or higher	0.481	0.079	367	298	2.998	0.165	0.323	0.639
Literate	0.486	0.080	367	298	3.039	0.165	0.326	0.647
CHILDREN								
Slept under any mosquito net last night	0.308	0.065	382	314	2.015	0.210	0.179	0.437
Slept under an ITN last night	0.295	0.067	382	314	2.125	0.228	0.161	0.430
Slept under an ITN last night in households with at least one ITN	0.780	0.064	145	119	1.446	0.082	0.652	0.907
Had fever in last 2 weeks	0.136	0.040	344	271	1.865	0.296	0.056	0.217
Sought care/treatment from a health facility	0.527	0.098	46	37	1.224	0.186	0.331	0.723
Took ACT	0.235	0.164	4	2	0.609	0.696	0.000	0.562
Has anaemia (haemoglobin <8.0 g/dl)	0.044	0.018	326	267	1.609	0.405	0.008	0.080
Has malaria (based on rapid test)	0.264	0.043	326	267	1.599	0.161	0.179	0.350
Has malaria (based on microscopy test)	0.188	0.047	325	266	2.030	0.249	0.095	0.282
PREGNANT WOMEN								
Slept under any mosquito net last night	0.266	0.069	31	27	0.896	0.260	0.128	0.404
Slept under an ITN last night	0.266	0.069	31	27	0.896	0.260	0.128	0.404
Slept under an ITN last night in households with at least one ITN	0.807	0.131	10	9	1.094	0.163	0.544	1.070
Received 1+ doses of SP/Fansidar	0.514	0.075	113	92	1.599	0.147	0.364	0.665
Received 2+ doses of SP/Fansidar	0.488	0.076	113	92	1.602	0.155	0.337	0.639
Received 3+ doses of SP/Fansidar	0.458	0.075	113	92	1.597	0.164	0.308	0.608

Table B.27 Sampling errors: Taraba state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.692	0.041	348	258	1.656	0.059	0.609	0.774
Average number of mosquito nets per household	1.563	0.185	348	258	2.126	0.118	1.194	1.933
Ownership of at least one ITN	0.646	0.046	348	258	1.786	0.071	0.554	0.738
Average number of ITNs per household	1.419	0.170	348	258	2.042	0.120	1.078	1.760
Ownership of at least one ITN for two persons	0.300	0.033	348	258	1.325	0.109	0.234	0.365
WOMEN								
No education	0.388	0.093	403	276	3.782	0.241	0.201	0.575
Secondary education or higher	0.409	0.114	403	276	4.519	0.278	0.182	0.636
Literate	0.546	0.091	403	276	3.615	0.167	0.364	0.728
CHILDREN								
Slept under any mosquito net last night	0.419	0.052	437	289	1.379	0.124	0.315	0.523
Slept under an ITN last night	0.381	0.041	437	289	1.142	0.109	0.298	0.463
Slept under an ITN last night in households with at least one ITN	0.561	0.041	298	196	0.876	0.073	0.479	0.643
Had fever in last 2 weeks	0.244	0.022	364	227	0.805	0.090	0.200	0.287
Sought care/treatment from a health facility	0.468	0.094	96	55	1.471	0.200	0.281	0.656
Took ACT	0.406	0.058	34	18	0.599	0.142	0.290	0.522
Has anaemia (haemoglobin <8.0 g/dl)	0.093	0.020	389	257	1.298	0.217	0.053	0.134
Has malaria (based on rapid test)	0.245	0.044	389	257	1.680	0.181	0.156	0.334
Has malaria (based on microscopy test)	0.179	0.047	388	256	1.968	0.261	0.085	0.272
PREGNANT WOMEN								
Slept under any mosquito net last night	0.521	0.133	31	20	1.402	0.255	0.255	0.788
Slept under an ITN last night	0.521	0.133	31	20	1.402	0.255	0.255	0.788
Slept under an ITN last night in households with at least one ITN	0.584	0.120	27	18	1.214	0.205	0.344	0.824
Received 1+ doses of SP/Fansidar	0.630	0.058	110	76	1.277	0.093	0.513	0.746
Received 2+ doses of SP/Fansidar	0.468	0.067	110	76	1.421	0.144	0.334	0.603
Received 3+ doses of SP/Fansidar	0.252	0.063	110	76	1.538	0.251	0.126	0.379

Table B.28 Sampling errors: Benue state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.748	0.032	400	381	1.468	0.043	0.685	0.812
Average number of mosquito nets per household	1.704	0.124	400	381	1.623	0.073	1.456	1.952
Ownership of at least one ITN	0.748	0.032	400	381	1.468	0.043	0.685	0.812
Average number of ITNs per household	1.701	0.123	400	381	1.619	0.073	1.454	1.948
Ownership of at least one ITN for two persons	0.385	0.037	400	381	1.530	0.097	0.310	0.459
WOMEN								
No education	0.134	0.022	463	418	1.415	0.167	0.089	0.179
Secondary education or higher	0.628	0.032	463	418	1.426	0.051	0.564	0.692
Literate	0.645	0.041	463	418	1.841	0.064	0.563	0.727
CHILDREN								
Slept under any mosquito net last night	0.576	0.044	354	327	1.279	0.076	0.489	0.664
Slept under an ITN last night	0.576	0.044	354	327	1.279	0.076	0.489	0.664
Slept under an ITN last night in households with at least one ITN	0.768	0.039	262	246	1.304	0.051	0.689	0.846
Had fever in last 2 weeks	0.183	0.035	297	264	1.384	0.192	0.113	0.254
Sought care/treatment from a health facility	0.731	0.059	45	48	0.948	0.080	0.614	0.848
Took ACT	0.830	0.057	33	35	0.954	0.069	0.716	0.944
Has anaemia (haemoglobin <8.0 g/dl)	0.067	0.021	320	293	1.391	0.316	0.025	0.110
Has malaria (based on rapid test)	0.340	0.058	320	293	1.924	0.171	0.224	0.456
Has malaria (based on microscopy test)	0.176	0.034	316	290	1.396	0.195	0.107	0.244
PREGNANT WOMEN								
Slept under any mosquito net last night	0.708	0.133	23	24	1.462	0.187	0.443	0.974
Slept under an ITN last night	0.708	0.133	23	24	1.462	0.187	0.443	0.974
Slept under an ITN last night in households with at least one ITN	0.880	0.091	18	19	1.262	0.104	0.697	1.062
Received 1+ doses of SP/Fansidar	0.662	0.068	131	120	1.638	0.102	0.527	0.797
Received 2+ doses of SP/Fansidar	0.591	0.052	131	120	1.222	0.088	0.487	0.696
Received 3+ doses of SP/Fansidar	0.477	0.058	131	120	1.343	0.122	0.360	0.594

Table B.29 Sampling errors: Kogi state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.342	0.066	355	286	2.603	0.193	0.210	0.474
Average number of mosquito nets per household	0.656	0.169	355	286	2.641	0.258	0.317	0.994
Ownership of at least one ITN	0.315	0.067	355	286	2.687	0.212	0.181	0.449
Average number of ITNs per household	0.615	0.174	355	286	2.731	0.283	0.267	0.963
Ownership of at least one ITN for two persons	0.132	0.034	354	285	1.891	0.260	0.063	0.200
WOMEN								
No education	0.154	0.029	329	251	1.457	0.189	0.096	0.212
Secondary education or higher	0.596	0.083	329	251	3.032	0.140	0.429	0.762
Literate	0.557	0.081	329	251	2.911	0.145	0.395	0.718
CHILDREN								
Slept under any mosquito net last night	0.231	0.068	237	178	1.802	0.296	0.094	0.368
Slept under an ITN last night	0.210	0.066	237	178	1.810	0.314	0.078	0.343
Slept under an ITN last night in households with at least one ITN	0.597	0.061	89	63	0.895	0.103	0.474	0.720
Had fever in last 2 weeks	0.338	0.039	185	131	1.076	0.116	0.259	0.416
Sought care/treatment from a health facility	0.667	0.116	56	44	1.904	0.174	0.435	0.899
Took ACT	0.774	0.091	35	24	1.199	0.117	0.593	0.956
Has anaemia (haemoglobin <8.0 g/dl)	0.073	0.023	206	153	1.263	0.313	0.028	0.119
Has malaria (based on rapid test)	0.277	0.067	206	153	1.770	0.242	0.143	0.412
Has malaria (based on microscopy test)	0.159	0.040	204	151	1.295	0.251	0.079	0.239
PREGNANT WOMEN								
Slept under any mosquito net last night	0.241	0.108	20	16	1.128	0.447	0.026	0.457
Slept under an ITN last night	0.241	0.108	20	16	1.128	0.447	0.026	0.457
Slept under an ITN last night in households with at least one ITN	0.509	0.185	10	8	1.137	0.362	0.140	0.879
Received 1+ doses of SP/Fansidar	0.543	0.063	71	51	1.041	0.117	0.416	0.669
Received 2+ doses of SP/Fansidar	0.467	0.062	71	51	1.018	0.133	0.343	0.590
Received 3+ doses of SP/Fansidar	0.257	0.051	71	51	0.952	0.197	0.156	0.359

Table B.30 Sampling errors: Kwara state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.648	0.066	337	298	2.505	0.102	0.516	0.779
Average number of mosquito nets per household	1.263	0.162	337	298	2.298	0.128	0.940	1.587
Ownership of at least one ITN	0.629	0.072	337	298	2.695	0.114	0.486	0.772
Average number of ITNs per household	1.242	0.167	337	298	2.355	0.135	0.908	1.576
Ownership of at least one ITN for two persons	0.292	0.049	337	298	1.947	0.166	0.195	0.389
WOMEN								
No education	0.162	0.068	313	277	3.194	0.418	0.026	0.297
Secondary education or higher	0.659	0.071	313	277	2.605	0.107	0.518	0.800
Literate	0.733	0.074	313	277	2.913	0.101	0.585	0.881
CHILDREN								
Slept under any mosquito net last night	0.467	0.047	204	203	1.093	0.100	0.374	0.560
Slept under an ITN last night	0.442	0.041	204	203	0.969	0.093	0.360	0.524
Slept under an ITN last night in households with at least one ITN	0.585	0.077	155	153	1.509	0.131	0.431	0.738
Had fever in last 2 weeks	0.244	0.078	193	183	2.360	0.320	0.088	0.399
Sought care/treatment from a health facility	0.573	0.099	40	45	1.255	0.173	0.375	0.772
Took ACT	0.447	0.081	16	19	0.704	0.182	0.284	0.610
Has anaemia (haemoglobin <8.0 g/dl)	0.029	0.009	170	165	0.708	0.298	0.012	0.046
Has malaria (based on rapid test)	0.176	0.062	170	165	1.944	0.352	0.052	0.300
Has malaria (based on microscopy test)	0.056	0.020	170	165	1.195	0.350	0.017	0.096
PREGNANT WOMEN								
Slept under any mosquito net last night	0.428	0.102	26	25	1.107	0.239	0.223	0.633
Slept under an ITN last night	0.428	0.102	26	25	1.107	0.239	0.223	0.633
Slept under an ITN last night in households with at least one ITN	0.573	0.132	17	19	1.235	0.231	0.309	0.838
Received 1+ doses of SP/Fansidar	0.592	0.096	81	77	1.811	0.162	0.401	0.784
Received 2+ doses of SP/Fansidar	0.431	0.088	81	77	1.661	0.205	0.254	0.608
Received 3+ doses of SP/Fansidar	0.274	0.065	81	77	1.361	0.238	0.144	0.404

Table B.31 Sampling errors: Oyo state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.541	0.029	374	562	1.132	0.054	0.482	0.599
Average number of mosquito nets per household	1.156	0.111	374	562	1.622	0.096	0.934	1.377
Ownership of at least one ITN	0.537	0.030	374	562	1.149	0.055	0.478	0.597
Average number of ITNs per household	1.134	0.113	374	562	1.690	0.100	0.908	1.360
Ownership of at least one ITN for two persons	0.305	0.035	372	559	1.463	0.115	0.235	0.375
WOMEN								
No education	0.147	0.047	359	497	2.502	0.321	0.053	0.242
Secondary education or higher	0.728	0.051	359	497	2.163	0.070	0.625	0.830
Literate	0.800	0.055	359	497	2.559	0.068	0.691	0.909
CHILDREN								
Slept under any mosquito net last night	0.356	0.051	210	318	1.319	0.143	0.254	0.458
Slept under an ITN last night	0.356	0.051	210	318	1.319	0.143	0.254	0.458
Slept under an ITN last night in households with at least one ITN	0.605	0.055	121	187	1.056	0.091	0.495	0.716
Had fever in last 2 weeks	0.183	0.047	208	300	1.789	0.254	0.090	0.276
Sought care/treatment from a health facility	0.460	0.081	35	55	1.028	0.177	0.297	0.623
Took ACT	0.395	0.107	17	25	0.934	0.270	0.181	0.608
Has anaemia (haemoglobin <8.0 g/dl)	0.063	0.023	178	268	1.162	0.367	0.017	0.109
Has malaria (based on rapid test)	0.296	0.056	178	268	1.440	0.189	0.184	0.407
Has malaria (based on microscopy test)	0.209	0.059	178	268	1.740	0.280	0.092	0.326
PREGNANT WOMEN								
Slept under any mosquito net last night	0.344	0.103	18	24	0.863	0.300	0.138	0.550
Slept under an ITN last night	0.344	0.103	18	24	0.863	0.300	0.138	0.550
Slept under an ITN last night in households with at least one ITN	0.514	0.134	13	16	0.870	0.260	0.246	0.781
Received 1+ doses of SP/Fansidar	0.558	0.069	83	123	1.316	0.124	0.420	0.697
Received 2+ doses of SP/Fansidar	0.401	0.062	83	123	1.193	0.155	0.277	0.525
Received 3+ doses of SP/Fansidar	0.189	0.044	83	123	1.047	0.230	0.102	0.276

Table B.32 Sampling errors: Osun state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.722	0.036	366	340	1.520	0.049	0.650	0.793
Average number of mosquito nets per household	1.975	0.124	366	340	1.314	0.063	1.728	2.222
Ownership of at least one ITN	0.719	0.035	366	340	1.499	0.049	0.648	0.789
Average number of ITNs per household	1.969	0.125	366	340	1.326	0.063	1.719	2.219
Ownership of at least one ITN for two persons	0.526	0.051	364	338	1.934	0.097	0.425	0.628
WOMEN								
No education	0.040	0.020	354	320	1.933	0.509	0.000	0.080
Secondary education or higher	0.813	0.035	354	320	1.662	0.043	0.744	0.882
Literate	0.802	0.032	354	320	1.491	0.039	0.739	0.866
CHILDREN								
Slept under any mosquito net last night	0.351	0.059	172	176	1.479	0.170	0.232	0.470
Slept under an ITN last night	0.351	0.059	172	176	1.479	0.170	0.232	0.470
Slept under an ITN last night in households with at least one ITN	0.545	0.074	115	113	1.487	0.136	0.397	0.693
Had fever in last 2 weeks	0.157	0.021	160	157	0.806	0.135	0.114	0.199
Sought care/treatment from a health facility	0.610	0.077	25	25	0.819	0.126	0.457	0.763
Took ACT	0.789	0.152	11	11	1.274	0.193	0.485	1.093
Has anaemia (haemoglobin <8.0 g/dl)	0.027	0.012	149	153	0.962	0.446	0.003	0.051
Has malaria (based on rapid test)	0.276	0.046	149	153	1.203	0.166	0.184	0.367
Has malaria (based on microscopy test)	0.193	0.036	148	152	1.158	0.187	0.121	0.266
PREGNANT WOMEN								
Slept under any mosquito net last night	0.259	0.138	19	20	1.467	0.532	0.000	0.534
Slept under an ITN last night	0.259	0.138	19	20	1.467	0.532	0.000	0.534
Slept under an ITN last night in households with at least one ITN	0.565	0.205	9	9	1.305	0.362	0.156	0.975
Received 1+ doses of SP/Fansidar	0.557	0.068	65	64	1.146	0.121	0.422	0.692
Received 2+ doses of SP/Fansidar	0.448	0.064	65	64	1.080	0.142	0.321	0.575
Received 3+ doses of SP/Fansidar	0.252	0.044	65	64	0.864	0.177	0.163	0.341

Table B.33 Sampling errors: Ekiti state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.254	0.036	331	151	1.495	0.141	0.182	0.326
Average number of mosquito nets per household	0.409	0.056	331	151	1.249	0.137	0.297	0.520
Ownership of at least one ITN	0.254	0.036	331	151	1.495	0.141	0.182	0.326
Average number of ITNs per household	0.406	0.057	331	151	1.282	0.141	0.292	0.521
Ownership of at least one ITN for two persons	0.087	0.020	327	149	1.275	0.228	0.047	0.127
WOMEN								
No education	0.037	0.014	278	123	1.279	0.395	0.008	0.065
Secondary education or higher	0.868	0.024	278	123	1.174	0.028	0.820	0.915
Literate	0.921	0.016	278	123	0.971	0.017	0.890	0.953
CHILDREN								
Slept under any mosquito net last night	0.108	0.027	170	83	1.023	0.254	0.053	0.162
Slept under an ITN last night	0.108	0.027	170	83	1.023	0.254	0.053	0.162
Slept under an ITN last night in households with at least one ITN	0.260	0.061	64	34	0.975	0.234	0.138	0.382
Had fever in last 2 weeks	0.191	0.048	142	65	1.426	0.251	0.095	0.287
Sought care/treatment from a health facility	0.412	0.133	33	12	1.351	0.323	0.146	0.677
Took ACT	0.859	0.080	15	5	0.800	0.093	0.699	1.020
Has anaemia (haemoglobin <8.0 g/dl)	0.029	0.019	150	75	1.542	0.668	0.000	0.067
Has malaria (based on rapid test)	0.365	0.074	150	75	1.582	0.203	0.217	0.513
Has malaria (based on microscopy test)	0.208	0.105	150	75	2.607	0.502	0.000	0.417
PREGNANT WOMEN								
Slept under any mosquito net last night	0.154	0.135	8	5	1.229	0.871	0.000	0.423
Slept under an ITN last night	0.154	0.135	8	5	1.229	0.871	0.000	0.423
Slept under an ITN last night in households with at least one ITN	0.653	0.358	2	1	1.242	0.548	0.000	1.370
Received 1+ doses of SP/Fansidar	0.740	0.052	54	25	0.879	0.070	0.636	0.843
Received 2+ doses of SP/Fansidar	0.626	0.079	54	25	1.213	0.126	0.468	0.783
Received 3+ doses of SP/Fansidar	0.400	0.078	54	25	1.185	0.194	0.245	0.556

Table B.34 Sampling errors: Ondo state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.334	0.028	320	167	1.044	0.083	0.279	0.389
Average number of mosquito nets per household	0.671	0.087	320	167	1.322	0.130	0.497	0.846
Ownership of at least one ITN	0.328	0.028	320	167	1.049	0.084	0.273	0.383
Average number of ITNs per household	0.663	0.088	320	167	1.330	0.132	0.487	0.839
Ownership of at least one ITN for two persons	0.156	0.027	320	167	1.325	0.173	0.102	0.210
WOMEN								
No education	0.068	0.015	306	156	1.008	0.213	0.039	0.097
Secondary education or higher	0.780	0.034	306	156	1.439	0.044	0.711	0.848
Literate	0.803	0.027	306	156	1.176	0.033	0.749	0.856
CHILDREN								
Slept under any mosquito net last night	0.257	0.041	221	121	1.124	0.158	0.176	0.338
Slept under an ITN last night	0.249	0.039	221	121	1.077	0.156	0.171	0.326
Slept under an ITN last night in households with at least one ITN	0.633	0.065	95	48	0.987	0.103	0.503	0.763
Had fever in last 2 weeks	0.152	0.045	171	88	1.538	0.293	0.063	0.242
Sought care/treatment from a health facility	0.488	0.133	28	13	1.267	0.273	0.222	0.754
Took ACT	0.200	0.133	9	4	0.981	0.664	0.000	0.465
Has anaemia (haemoglobin <8.0 g/dl)	0.103	0.028	210	114	1.231	0.268	0.048	0.158
Has malaria (based on rapid test)	0.448	0.055	210	114	1.472	0.123	0.338	0.559
Has malaria (based on microscopy test)	0.267	0.044	210	114	1.234	0.164	0.179	0.354
PREGNANT WOMEN								
Slept under any mosquito net last night	0.282	0.076	24	14	0.840	0.269	0.131	0.434
Slept under an ITN last night	0.256	0.076	24	14	0.869	0.296	0.104	0.407
Slept under an ITN last night in households with at least one ITN	0.819	0.099	9	4	0.736	0.121	0.621	1.018
Received 1+ doses of SP/Fansidar	0.600	0.093	65	33	1.509	0.155	0.414	0.785
Received 2+ doses of SP/Fansidar	0.501	0.081	65	33	1.300	0.162	0.339	0.664
Received 3+ doses of SP/Fansidar	0.282	0.058	65	33	1.035	0.207	0.166	0.399

Table B.35 Sampling errors: Edo state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.280	0.029	346	311	1.207	0.104	0.222	0.339
Average number of mosquito nets per household	0.600	0.082	346	311	1.304	0.136	0.436	0.763
Ownership of at least one ITN	0.279	0.029	346	311	1.208	0.105	0.220	0.337
Average number of ITNs per household	0.581	0.085	346	311	1.388	0.147	0.411	0.752
Ownership of at least one ITN for two persons	0.146	0.022	345	310	1.165	0.152	0.102	0.191
WOMEN								
No education	0.065	0.015	331	300	1.098	0.229	0.035	0.095
Secondary education or higher	0.819	0.036	331	300	1.713	0.044	0.747	0.892
Literate	0.791	0.041	331	300	1.839	0.052	0.708	0.873
CHILDREN								
Slept under any mosquito net last night	0.174	0.058	146	126	1.461	0.333	0.058	0.289
Slept under an ITN last night	0.174	0.058	146	126	1.461	0.333	0.058	0.289
Slept under an ITN last night in households with at least one ITN	0.524	0.121	55	42	1.415	0.230	0.283	0.766
Had fever in last 2 weeks	0.408	0.045	145	123	0.969	0.111	0.317	0.498
Sought care/treatment from a health facility	0.641	0.089	59	50	1.299	0.139	0.463	0.820
Took ACT	0.721	0.115	18	15	1.023	0.160	0.491	0.951
Has anaemia (haemoglobin <8.0 g/dl)	0.030	0.022	104	90	1.076	0.714	0.000	0.074
Has malaria (based on rapid test)	0.302	0.052	104	90	0.991	0.173	0.197	0.407
Has malaria (based on microscopy test)	0.226	0.051	104	90	1.059	0.227	0.123	0.329
PREGNANT WOMEN								
Slept under any mosquito net last night	0.069	0.068	22	19	1.230	0.978	0.000	0.205
Slept under an ITN last night	0.069	0.068	22	19	1.230	0.978	0.000	0.205
Slept under an ITN last night in households with at least one ITN	0.597	0.340	4	2	1.090	0.570	0.000	1.277
Received 1+ doses of SP/Fansidar	0.617	0.108	62	53	1.695	0.175	0.401	0.833
Received 2+ doses of SP/Fansidar	0.563	0.087	62	53	1.342	0.155	0.388	0.737
Received 3+ doses of SP/Fansidar	0.262	0.063	62	53	1.091	0.239	0.137	0.387

Table B.36 Sampling errors: Anambra state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.267	0.026	400	325	1.172	0.097	0.215	0.319
Average number of mosquito nets per household	0.442	0.069	400	325	1.524	0.157	0.303	0.581
Ownership of at least one ITN	0.267	0.026	400	325	1.172	0.097	0.215	0.319
Average number of ITNs per household	0.437	0.067	400	325	1.481	0.152	0.304	0.570
Ownership of at least one ITN for two persons	0.121	0.021	398	324	1.284	0.174	0.079	0.163
WOMEN								
No education	0.014	0.007	357	283	1.113	0.503	0.000	0.027
Secondary education or higher	0.894	0.025	357	283	1.521	0.028	0.844	0.944
Literate	0.965	0.011	357	283	1.158	0.012	0.942	0.988
CHILDREN								
Slept under any mosquito net last night	0.204	0.058	219	180	1.702	0.287	0.087	0.321
Slept under an ITN last night	0.204	0.058	219	180	1.702	0.287	0.087	0.321
Slept under an ITN last night in households with at least one ITN	0.612	0.121	71	60	1.652	0.197	0.370	0.853
Had fever in last 2 weeks	0.375	0.068	211	166	1.714	0.181	0.239	0.511
Sought care/treatment from a health facility	0.885	0.039	69	62	0.933	0.044	0.808	0.963
Took ACT	0.415	0.134	46	43	1.550	0.322	0.148	0.683
Has anaemia (haemoglobin <8.0 g/dl)	0.025	0.013	195	159	1.123	0.500	0.000	0.050
Has malaria (based on rapid test)	0.202	0.049	196	160	1.405	0.242	0.104	0.299
Has malaria (based on microscopy test)	0.054	0.027	194	158	1.285	0.489	0.001	0.108
PREGNANT WOMEN								
Slept under any mosquito net last night	0.057	0.046	28	19	0.959	0.806	0.000	0.149
Slept under an ITN last night	0.057	0.046	28	19	0.959	0.806	0.000	0.149
Slept under an ITN last night in households with at least one ITN	0.244	0.175	7	4	0.954	0.718	0.000	0.594
Received 1+ doses of SP/Fansidar	0.872	0.064	66	53	1.561	0.073	0.744	1.000
Received 2+ doses of SP/Fansidar	0.773	0.081	66	53	1.585	0.105	0.611	0.936
Received 3+ doses of SP/Fansidar	0.523	0.076	66	53	1.238	0.145	0.372	0.674

Table B.37 Sampling errors: Enugu state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.228	0.045	375	279	2.078	0.198	0.138	0.319
Average number of mosquito nets per household	0.371	0.085	375	279	2.183	0.229	0.201	0.541
Ownership of at least one ITN	0.228	0.045	375	279	2.078	0.198	0.138	0.319
Average number of ITNs per household	0.371	0.085	375	279	2.183	0.229	0.201	0.541
Ownership of at least one ITN for two persons	0.113	0.036	367	275	2.151	0.317	0.041	0.184
WOMEN								
No education	0.042	0.013	289	204	1.094	0.309	0.016	0.067
Secondary education or higher	0.750	0.036	289	204	1.418	0.048	0.677	0.822
Literate	0.911	0.022	289	204	1.329	0.024	0.867	0.956
CHILDREN								
Slept under any mosquito net last night	0.129	0.053	244	183	1.833	0.413	0.023	0.236
Slept under an ITN last night	0.129	0.053	244	183	1.833	0.413	0.023	0.236
Slept under an ITN last night in households with at least one ITN	0.451	0.123	67	52	1.549	0.272	0.205	0.696
Had fever in last 2 weeks	0.249	0.060	199	137	1.601	0.240	0.130	0.369
Sought care/treatment from a health facility	0.732	0.066	46	34	1.005	0.090	0.601	0.863
Took ACT	0.761	0.106	22	17	1.259	0.139	0.549	0.972
Has anaemia (haemoglobin <8.0 g/dl)	0.068	0.028	223	166	1.394	0.415	0.011	0.124
Has malaria (based on rapid test)	0.302	0.079	223	166	2.241	0.262	0.144	0.460
Has malaria (based on microscopy test)	0.243	0.067	222	166	1.997	0.274	0.110	0.376
PREGNANT WOMEN								
Slept under any mosquito net last night	0.099	0.094	10	8	1.021	0.947	0.000	0.287
Slept under an ITN last night	0.099	0.094	10	8	1.021	0.947	0.000	0.287
Slept under an ITN last night in households with at least one ITN	0.461	0.385	2	2	1.163	0.835	0.000	1.231
Received 1+ doses of SP/Fansidar	0.706	0.068	62	46	1.199	0.096	0.571	0.842
Received 2+ doses of SP/Fansidar	0.659	0.073	62	46	1.237	0.110	0.514	0.805
Received 3+ doses of SP/Fansidar	0.299	0.072	62	46	1.262	0.240	0.156	0.442

Table B.38 Sampling errors: Ebonyi state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.662	0.034	325	334	1.294	0.051	0.594	0.730
Average number of mosquito nets per household	1.507	0.113	325	334	1.340	0.075	1.281	1.733
Ownership of at least one ITN	0.662	0.034	325	334	1.294	0.051	0.594	0.730
Average number of ITNs per household	1.498	0.112	325	334	1.347	0.075	1.273	1.722
Ownership of at least one ITN for two persons	0.327	0.036	325	334	1.395	0.111	0.254	0.400
WOMEN								
No education	0.030	0.015	312	297	1.578	0.514	0.000	0.060
Secondary education or higher	0.709	0.052	312	297	2.020	0.074	0.605	0.814
Literate	0.777	0.036	312	297	1.533	0.047	0.704	0.849
CHILDREN								
Slept under any mosquito net last night	0.539	0.056	331	340	1.477	0.103	0.428	0.650
Slept under an ITN last night	0.539	0.056	331	340	1.477	0.103	0.428	0.650
Slept under an ITN last night in households with at least one ITN	0.682	0.050	266	269	1.264	0.073	0.582	0.781
Had fever in last 2 weeks	0.268	0.032	306	297	1.151	0.121	0.204	0.333
Sought care/treatment from a health facility	0.720	0.065	87	80	1.185	0.090	0.590	0.851
Took ACT	0.850	0.043	38	35	0.709	0.050	0.765	0.935
Has anaemia (haemoglobin <8.0 g/dl)	0.037	0.010	303	315	0.805	0.256	0.018	0.056
Has malaria (based on rapid test)	0.302	0.057	303	315	1.986	0.188	0.188	0.416
Has malaria (based on microscopy test)	0.257	0.040	301	312	1.528	0.154	0.178	0.336
PREGNANT WOMEN								
Slept under any mosquito net last night	0.665	0.107	25	25	1.123	0.161	0.452	0.879
Slept under an ITN last night	0.665	0.107	25	25	1.123	0.161	0.452	0.879
Slept under an ITN last night in households with at least one ITN	0.872	0.082	19	19	1.070	0.094	0.707	1.037
Received 1+ doses of SP/Fansidar	0.923	0.032	99	91	1.167	0.035	0.859	0.987
Received 2+ doses of SP/Fansidar	0.821	0.038	99	91	0.967	0.046	0.745	0.897
Received 3+ doses of SP/Fansidar	0.429	0.059	99	91	1.162	0.137	0.311	0.547

Table B.39 Sampling errors: Cross River state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.529	0.035	372	274	1.360	0.067	0.459	0.600
Average number of mosquito nets per household	1.000	0.113	372	274	1.692	0.113	0.774	1.226
Ownership of at least one ITN	0.529	0.035	372	274	1.360	0.067	0.459	0.600
Average number of ITNs per household	1.000	0.113	372	274	1.692	0.113	0.774	1.226
Ownership of at least one ITN for two persons	0.260	0.022	372	274	0.951	0.083	0.216	0.303
WOMEN								
No education	0.064	0.028	318	224	2.013	0.436	0.008	0.119
Secondary education or higher	0.811	0.053	318	224	2.383	0.065	0.705	0.916
Literate	0.794	0.055	318	224	2.409	0.069	0.684	0.905
CHILDREN								
Slept under any mosquito net last night	0.387	0.054	261	205	1.394	0.141	0.278	0.496
Slept under an ITN last night	0.387	0.054	261	205	1.394	0.141	0.278	0.496
Slept under an ITN last night in households with at least one ITN	0.598	0.072	170	133	1.477	0.120	0.455	0.741
Had fever in last 2 weeks	0.406	0.031	211	157	0.911	0.077	0.343	0.469
Sought care/treatment from a health facility	0.584	0.049	87	64	0.940	0.084	0.485	0.682
Took ACT	0.824	0.074	37	27	1.198	0.090	0.676	0.972
Has anaemia (haemoglobin <8.0 g/dl)	0.015	0.007	237	185	0.881	0.451	0.001	0.028
Has malaria (based on rapid test)	0.406	0.085	237	185	2.395	0.211	0.235	0.576
Has malaria (based on microscopy test)	0.236	0.077	237	185	2.338	0.325	0.083	0.390
PREGNANT WOMEN								
Slept under any mosquito net last night	0.333	0.093	18	17	0.848	0.280	0.146	0.520
Slept under an ITN last night	0.333	0.093	18	17	0.848	0.280	0.146	0.520
Slept under an ITN last night in households with at least one ITN	0.510	0.126	11	11	0.897	0.248	0.258	0.763
Received 1+ doses of SP/Fansidar	0.777	0.073	82	68	1.724	0.094	0.630	0.923
Received 2+ doses of SP/Fansidar	0.623	0.098	82	68	1.986	0.158	0.427	0.820
Received 3+ doses of SP/Fansidar	0.487	0.109	82	68	2.134	0.224	0.269	0.705

Table B.40 Sampling errors: Akwa Ibom state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.419	0.049	373	585	1.922	0.118	0.321	0.518
Average number of mosquito nets per household	0.808	0.107	373	585	1.706	0.132	0.594	1.022
Ownership of at least one ITN	0.413	0.049	373	585	1.923	0.119	0.315	0.512
Average number of ITNs per household	0.798	0.106	373	585	1.706	0.133	0.585	1.011
Ownership of at least one ITN for two persons	0.223	0.038	373	585	1.750	0.170	0.147	0.299
WOMEN								
No education	0.064	0.019	320	478	1.382	0.297	0.026	0.102
Secondary education or higher	0.717	0.040	320	478	1.591	0.056	0.636	0.797
Literate	0.854	0.040	320	478	2.002	0.047	0.774	0.933
CHILDREN								
Slept under any mosquito net last night	0.195	0.030	183	302	0.762	0.154	0.135	0.255
Slept under an ITN last night	0.195	0.030	183	302	0.762	0.154	0.135	0.255
Slept under an ITN last night in households with at least one ITN	0.434	0.064	82	135	0.914	0.148	0.306	0.563
Had fever in last 2 weeks	0.442	0.082	163	250	1.814	0.186	0.277	0.606
Sought care/treatment from a health facility	0.444	0.086	75	110	1.255	0.195	0.271	0.617
Took ACT	0.839	0.158	10	13	0.936	0.188	0.524	1.154
Has anaemia (haemoglobin <8.0 g/dl)	0.087	0.032	156	262	1.311	0.363	0.024	0.150
Has malaria (based on rapid test)	0.335	0.073	156	262	1.772	0.217	0.189	0.481
Has malaria (based on microscopy test)	0.301	0.071	155	259	1.639	0.237	0.159	0.444
PREGNANT WOMEN								
Slept under any mosquito net last night	0.282	0.122	14	16	0.871	0.432	0.039	0.526
Slept under an ITN last night	0.282	0.122	14	16	0.871	0.432	0.039	0.526
Slept under an ITN last night in households with at least one ITN	0.540	0.208	7	9	0.970	0.385	0.125	0.956
Received 1+ doses of SP/Fansidar	0.434	0.053	68	105	0.896	0.122	0.328	0.540
Received 2+ doses of SP/Fansidar	0.300	0.046	68	105	0.838	0.153	0.208	0.392
Received 3+ doses of SP/Fansidar	0.069	0.031	68	105	1.006	0.441	0.008	0.130

Table B.41 Sampling errors: Abia state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.305	0.053	330	206	2.080	0.174	0.199	0.411
Average number of mosquito nets per household	0.634	0.105	330	206	1.637	0.166	0.423	0.845
Ownership of at least one ITN	0.303	0.053	330	206	2.067	0.174	0.197	0.408
Average number of ITNs per household	0.632	0.105	330	206	1.630	0.166	0.422	0.842
Ownership of at least one ITN for two persons	0.150	0.030	329	205	1.495	0.197	0.091	0.209
WOMEN								
No education	0.047	0.016	299	178	1.276	0.332	0.016	0.079
Secondary education or higher	0.854	0.028	299	178	1.385	0.033	0.797	0.911
Literate	0.916	0.020	299	178	1.215	0.021	0.877	0.955
CHILDREN								
Slept under any mosquito net last night	0.219	0.060	251	163	1.722	0.273	0.099	0.339
Slept under an ITN last night	0.219	0.060	251	163	1.722	0.273	0.099	0.339
Slept under an ITN last night in households with at least one ITN	0.633	0.052	89	56	0.801	0.082	0.529	0.737
Had fever in last 2 weeks	0.411	0.044	248	153	1.239	0.107	0.323	0.499
Sought care/treatment from a health facility	0.791	0.056	109	63	1.296	0.071	0.679	0.904
Took ACT	0.895	0.052	58	35	1.073	0.058	0.792	0.998
Has anaemia (haemoglobin <8.0 g/dl)	0.066	0.018	231	149	1.120	0.277	0.030	0.103
Has malaria (based on rapid test)	0.264	0.085	231	149	2.371	0.321	0.095	0.434
Has malaria (based on microscopy test)	0.145	0.056	231	149	1.905	0.389	0.032	0.258
PREGNANT WOMEN								
Slept under any mosquito net last night	0.087	0.087	17	9	1.194	1.000	0.000	0.261
Slept under an ITN last night	0.087	0.087	17	9	1.194	1.000	0.000	0.261
Slept under an ITN last night in households with at least one ITN	0.467	0.379	3	2	1.268	0.811	0.000	1.226
Received 1+ doses of SP/Fansidar	0.853	0.036	89	56	0.980	0.042	0.781	0.925
Received 2+ doses of SP/Fansidar	0.827	0.034	89	56	0.869	0.041	0.759	0.895
Received 3+ doses of SP/Fansidar	0.511	0.062	89	56	1.192	0.121	0.387	0.634

Table B.42 Sampling errors: Imo state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.309	0.026	378	211	1.105	0.085	0.256	0.362
Average number of mosquito nets per household	0.652	0.063	378	211	1.010	0.097	0.525	0.778
Ownership of at least one ITN	0.309	0.026	378	211	1.105	0.085	0.256	0.362
Average number of ITNs per household	0.649	0.063	378	211	1.020	0.098	0.522	0.776
Ownership of at least one ITN for two persons	0.195	0.022	378	211	1.084	0.113	0.151	0.239
WOMEN								
No education	0.010	0.006	266	149	0.979	0.588	0.000	0.022
Secondary education or higher	0.907	0.014	266	149	0.796	0.016	0.879	0.936
Literate	0.934	0.016	266	149	1.079	0.018	0.901	0.967
CHILDREN								
Slept under any mosquito net last night	0.106	0.032	226	128	1.144	0.297	0.043	0.169
Slept under an ITN last night	0.106	0.032	226	128	1.144	0.297	0.043	0.169
Slept under an ITN last night in households with at least one ITN	0.296	0.092	80	46	1.372	0.311	0.112	0.481
Had fever in last 2 weeks	0.380	0.041	198	111	0.994	0.107	0.299	0.461
Sought care/treatment from a health facility	0.774	0.048	76	42	0.960	0.062	0.677	0.871
Took ACT	0.706	0.104	31	17	1.151	0.148	0.498	0.915
Has anaemia (haemoglobin <8.0 g/dl)	0.010	0.007	197	111	1.002	0.691	0.000	0.025
Has malaria (based on rapid test)	0.262	0.044	197	111	1.237	0.169	0.173	0.350
Has malaria (based on microscopy test)	0.155	0.028	195	110	0.969	0.180	0.099	0.211
PREGNANT WOMEN								
Slept under any mosquito net last night	0.043	0.046	20	12	1.032	1.066	0.000	0.134
Slept under an ITN last night	0.043	0.046	20	12	1.032	1.066	0.000	0.134
Slept under an ITN last night in households with at least one ITN	0.183	0.182	5	3	0.998	0.990	0.000	0.546
Received 1+ doses of SP/Fansidar	0.475	0.076	67	38	1.241	0.160	0.324	0.627
Received 2+ doses of SP/Fansidar	0.366	0.075	67	38	1.271	0.205	0.216	0.515
Received 3+ doses of SP/Fansidar	0.206	0.048	67	38	0.972	0.233	0.110	0.302

Table B.43 Sampling errors: Rivers state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.228	0.038	617	364	2.227	0.166	0.153	0.304
Average number of mosquito nets per household	0.378	0.068	617	364	2.006	0.180	0.241	0.514
Ownership of at least one ITN	0.226	0.038	617	364	2.220	0.166	0.151	0.301
Average number of ITNs per household	0.374	0.068	617	364	1.995	0.181	0.239	0.509
Ownership of at least one ITN for two persons	0.056	0.011	615	363	1.158	0.191	0.035	0.078
WOMEN								
No education	0.024	0.014	539	304	2.088	0.575	0.000	0.052
Secondary education or higher	0.888	0.034	539	304	2.523	0.039	0.819	0.957
Literate	0.900	0.032	539	304	2.482	0.036	0.835	0.964
CHILDREN								
Slept under any mosquito net last night	0.144	0.039	383	254	1.689	0.271	0.066	0.221
Slept under an ITN last night	0.144	0.039	383	254	1.689	0.271	0.066	0.221
Slept under an ITN last night in households with at least one ITN	0.462	0.086	133	79	1.527	0.186	0.291	0.634
Had fever in last 2 weeks	0.306	0.037	334	213	1.367	0.121	0.232	0.380
Sought care/treatment from a health facility	0.582	0.097	97	65	1.849	0.168	0.387	0.776
Took ACT	0.809	0.048	30	19	0.740	0.059	0.714	0.905
has anaemia (haemoglobin <8.0 g/dl)	0.053	0.017	349	232	1.408	0.323	0.019	0.087
Has malaria (based on rapid test)	0.338	0.058	349	232	1.993	0.170	0.223	0.453
Has malaria (based on microscopy test)	0.086	0.033	349	232	2.022	0.379	0.021	0.152
PREGNANT WOMEN								
Slept under any mosquito net last night	0.014	0.009	31	12	0.362	0.667	0.000	0.032
Slept under an ITN last night	0.014	0.009	31	12	0.362	0.667	0.000	0.032
Slept under an ITN last night in households with at least one ITN	0.052	0.035	14	3	0.374	0.677	0.000	0.123
Received 1+ doses of SP/Fansidar	0.792	0.052	103	66	1.392	0.066	0.688	0.897
Received 2+ doses of SP/Fansidar	0.630	0.077	103	66	1.727	0.123	0.476	0.785
Received 3+ doses of SP/Fansidar	0.380	0.086	103	66	1.903	0.226	0.208	0.551

Table B.44 Sampling errors: Bayelsa state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.378	0.034	303	129	1.228	0.091	0.309	0.446
Average number of mosquito nets per household	0.674	0.063	303	129	1.060	0.093	0.549	0.799
Ownership of at least one ITN	0.316	0.039	303	129	1.464	0.124	0.237	0.394
Average number of ITNs per household	0.553	0.072	303	129	1.296	0.130	0.409	0.697
Ownership of at least one ITN for two persons	0.142	0.025	303	129	1.227	0.174	0.092	0.191
WOMEN								
No education	0.084	0.030	314	131	1.931	0.362	0.023	0.145
Secondary education or higher	0.769	0.065	314	131	2.709	0.085	0.638	0.899
Literate	0.739	0.074	314	131	2.959	0.101	0.591	0.888
CHILDREN								
Slept under any mosquito net last night	0.259	0.047	269	121	1.361	0.183	0.164	0.353
Slept under an ITN last night	0.228	0.053	269	121	1.580	0.233	0.121	0.334
Slept under an ITN last night in households with at least one ITN	0.608	0.054	101	45	0.977	0.089	0.500	0.717
Had fever in last 2 weeks	0.242	0.027	237	105	0.874	0.111	0.188	0.296
Sought care/treatment from a health facility	0.522	0.054	53	25	0.716	0.104	0.414	0.630
Took ACT	0.601	0.148	10	4	0.816	0.247	0.305	0.898
Has anaemia (haemoglobin <8.0 g/dl)	0.011	0.007	243	110	1.063	0.621	0.000	0.025
Has malaria (based on rapid test)	0.271	0.058	243	110	1.739	0.213	0.155	0.386
Has malaria (based on microscopy test)	0.167	0.038	243	110	1.384	0.224	0.092	0.243
PREGNANT WOMEN								
Slept under any mosquito net last night	0.229	0.085	28	12	1.053	0.370	0.060	0.398
Slept under an ITN last night	0.229	0.085	28	12	1.053	0.370	0.060	0.398
Slept under an ITN last night in households with at least one ITN	0.524	0.149	12	5	1.033	0.285	0.226	0.823
Received 1+ doses of SP/Fansidar	0.447	0.087	69	29	1.446	0.195	0.272	0.621
Received 2+ doses of SP/Fansidar	0.385	0.076	69	29	1.293	0.198	0.232	0.537
Received 3+ doses of SP/Fansidar	0.253	0.068	69	29	1.284	0.268	0.118	0.388

Table B.45 Sampling errors: Delta state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.548	0.030	393	373	1.213	0.056	0.487	0.609
Average number of mosquito nets per household	1.041	0.076	393	373	1.234	0.073	0.889	1.193
Ownership of at least one ITN	0.548	0.030	393	373	1.213	0.056	0.487	0.609
Average number of ITNs per household	1.041	0.076	393	373	1.234	0.073	0.889	1.193
Ownership of at least one ITN for two persons	0.280	0.029	392	372	1.263	0.103	0.223	0.337
WOMEN								
No education	0.118	0.030	326	298	1.695	0.258	0.057	0.179
Secondary education or higher	0.836	0.036	326	298	1.768	0.044	0.763	0.909
Literate	0.820	0.041	326	298	1.931	0.050	0.738	0.903
CHILDREN								
Slept under any mosquito net last night	0.281	0.066	379	350	2.006	0.233	0.150	0.412
Slept under an ITN last night	0.281	0.066	379	350	2.006	0.233	0.150	0.412
Slept under an ITN last night in households with at least one ITN	0.447	0.106	235	220	2.217	0.238	0.234	0.660
Had fever in last 2 weeks	0.373	0.025	306	272	0.785	0.067	0.323	0.423
Sought care/treatment from a health facility	0.426	0.074	118	101	1.332	0.173	0.279	0.573
Took ACT	0.738	0.108	32	30	1.367	0.146	0.523	0.953
Has anaemia (haemoglobin <8.0 g/dl)	0.025	0.011	349	318	1.235	0.418	0.004	0.046
Has malaria (based on rapid test)	0.189	0.049	349	318	1.867	0.262	0.090	0.288
Has malaria (based on microscopy test)	0.100	0.031	347	316	1.761	0.313	0.037	0.163
PREGNANT WOMEN								
Slept under any mosquito net last night	0.285	0.159	18	18	1.507	0.556	0.000	0.603
Slept under an ITN last night	0.285	0.159	18	18	1.507	0.556	0.000	0.603
Slept under an ITN last night in households with at least one ITN	0.446	0.199	13	11	1.375	0.446	0.048	0.844
Received 1+ doses of SP/Fansidar	0.602	0.043	90	82	0.831	0.071	0.516	0.688
Received 2+ doses of SP/Fansidar	0.499	0.059	90	82	1.107	0.117	0.382	0.616
Received 3+ doses of SP/Fansidar	0.382	0.054	90	82	1.043	0.140	0.275	0.489

Table B.46 Sampling errors: Lagos state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.383	0.041	423	811	1.729	0.107	0.301	0.465
Average number of mosquito nets per household	0.690	0.098	423	811	1.869	0.142	0.493	0.886
Ownership of at least one ITN	0.290	0.034	423	811	1.559	0.119	0.221	0.359
Average number of ITNs per household	0.496	0.069	423	811	1.546	0.139	0.358	0.635
Ownership of at least one ITN for two persons	0.132	0.023	415	796	1.379	0.174	0.086	0.178
WOMEN								
No education	0.031	0.018	346	620	1.958	0.595	0.000	0.067
Secondary education or higher	0.899	0.027	346	620	1.660	0.030	0.845	0.953
Literate	0.878	0.029	346	620	1.639	0.033	0.820	0.936
CHILDREN								
Slept under any mosquito net last night	0.140	0.036	203	391	1.149	0.256	0.068	0.212
Slept under an ITN last night	0.092	0.023	203	391	0.936	0.255	0.045	0.139
Slept under an ITN last night in households with at least one ITN	0.279	0.081	70	129	1.219	0.291	0.116	0.442
Had fever in last 2 weeks	0.346	0.033	189	352	0.860	0.096	0.279	0.413
Sought care/treatment from a health facility	0.734	0.054	66	122	0.965	0.074	0.626	0.842
Took ACT	0.891	0.057	27	55	0.991	0.063	0.778	1.004
Has anaemia (haemoglobin <8.0 g/dl)	0.027	0.012	180	349	0.920	0.463	0.002	0.052
Has malaria (based on rapid test)	0.032	0.021	180	349	1.333	0.645	0.000	0.074
Has malaria (based on microscopy test)	0.026	0.015	179	347	1.277	0.584	0.000	0.056
PREGNANT WOMEN								
Slept under any mosquito net last night	0.101	0.072	15	30	0.943	0.708	0.000	0.244
Slept under an ITN last night	0.101	0.072	15	30	0.943	0.708	0.000	0.244
Slept under an ITN last night in households with at least one ITN	0.151	0.103	10	20	0.941	0.687	0.000	0.357
Received 1+ doses of SP/Fansidar	0.691	0.054	76	147	1.049	0.078	0.584	0.799
Received 2+ doses of SP/Fansidar	0.587	0.071	76	147	1.303	0.121	0.445	0.729
Received 3+ doses of SP/Fansidar	0.307	0.065	76	147	1.280	0.213	0.176	0.438

Table B.47 Sampling errors: Ogun state sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.397	0.089	374	375	3.478	0.225	0.218	0.576
Average number of mosquito nets per household	0.751	0.197	374	375	3.296	0.263	0.356	1.145
Ownership of at least one ITN	0.397	0.089	374	375	3.478	0.225	0.218	0.576
Average number of ITNs per household	0.751	0.197	374	375	3.296	0.263	0.356	1.145
Ownership of at least one ITN for two persons	0.216	0.046	373	372	2.161	0.215	0.123	0.308
WOMEN								
No education	0.134	0.040	330	308	2.139	0.302	0.053	0.214
Secondary education or higher	0.667	0.060	330	308	2.279	0.089	0.548	0.787
Literate	0.758	0.052	330	308	2.201	0.069	0.653	0.863
CHILDREN								
Slept under any mosquito net last night	0.182	0.044	202	206	1.458	0.243	0.093	0.270
Slept under an ITN last night	0.182	0.044	202	206	1.458	0.243	0.093	0.270
Slept under an ITN last night in households with at least one ITN	0.385	0.049	101	97	0.853	0.126	0.288	0.483
Had fever in last 2 weeks	0.253	0.035	174	171	1.050	0.137	0.183	0.322
Sought care/treatment from a health facility	0.394	0.060	43	43	0.784	0.153	0.273	0.515
Took ACT	0.921	0.078	13	14	1.135	0.085	0.765	1.078
Has anaemia (haemoglobin <8.0 g/dl)	0.094	0.030	173	173	1.294	0.317	0.034	0.153
Has malaria (based on rapid test)	0.356	0.101	173	173	2.333	0.282	0.155	0.557
Has malaria (based on microscopy test)	0.249	0.086	172	172	2.302	0.344	0.078	0.420
PREGNANT WOMEN								
Slept under any mosquito net last night	0.269	0.120	16	12	0.952	0.444	0.030	0.509
Slept under an ITN last night	0.269	0.120	16	12	0.952	0.444	0.030	0.509
Slept under an ITN last night in households with at least one ITN	0.419	0.160	10	8	0.915	0.381	0.100	0.738
Received 1+ doses of SP/Fansidar	0.548	0.056	70	73	0.992	0.102	0.437	0.659
Received 2+ doses of SP/Fansidar	0.417	0.036	70	73	0.656	0.087	0.344	0.490
Received 3+ doses of SP/Fansidar	0.357	0.042	70	73	0.781	0.118	0.273	0.442

Table B.48 Sampling errors: Bonny Island sample, Nigeria MIS 2021

Variable	Value (R)	Standard error (SE)	Number of cases: Un-weighted (N)	Number of cases: Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits: R-2SE	Confidence limits: R+2SE
HOUSEHOLDS								
Ownership of at least one mosquito net	0.343	0.027	199	8	0.793	0.078	0.289	0.396
Average number of mosquito nets per household	0.448	0.041	199	8	0.800	0.091	0.367	0.529
Ownership of at least one ITN	0.343	0.027	199	8	0.793	0.078	0.289	0.396
Average number of ITNs per household	0.448	0.041	199	8	0.800	0.091	0.367	0.529
Ownership of at least one ITN for two persons	0.132	0.017	199	8	0.711	0.129	0.098	0.166
WOMEN								
No education	0.012	0.009	173	6	1.049	0.721	0.000	0.030
Secondary education or higher	0.924	0.020	173	6	0.981	0.021	0.884	0.963
Literate	0.904	0.022	173	6	0.977	0.024	0.860	0.948
CHILDREN								
Slept under any mosquito net last night	0.157	0.068	95	4	1.599	0.435	0.021	0.294
Slept under an ITN last night	0.157	0.068	95	4	1.599	0.435	0.021	0.294
Slept under an ITN last night in households with at least one ITN	0.369	0.158	40	2	1.745	0.426	0.054	0.685
Had fever in last 2 weeks	0.206	0.057	80	3	1.186	0.279	0.091	0.321
Sought care/treatment from a health facility	0.509	0.177	18	1	1.322	0.347	0.156	0.863
Took ACT	0.720	0.170	8	0	0.911	0.236	0.380	1.060
Has anaemia (haemoglobin <8.0 g/dl)	0.007	0.008	88	4	0.923	1.122	0.000	0.023
Has malaria (based on rapid test)	0.415	0.023	88	4	0.394	0.055	0.369	0.460
Has malaria (based on microscopy test)	0.000	0.000	88	4	NA	NA	0.000	0.000
PREGNANT WOMEN								
Slept under any mosquito net last night	0.267	0.073	19	1	0.657	0.271	0.122	0.413
Slept under an ITN last night	0.267	0.073	19	1	0.657	0.271	0.122	0.413
Slept under an ITN last night in households with at least one ITN	0.464	0.096	10	0	0.585	0.207	0.272	0.655
Received 1+ doses of SP/Fansidar	0.611	0.089	22	1	0.903	0.146	0.433	0.790
Received 2+ doses of SP/Fansidar	0.481	0.103	22	1	1.016	0.214	0.275	0.687
Received 3+ doses of SP/Fansidar	0.188	0.101	22	1	1.274	0.537	0.000	0.391

DATA QUALITY TABLES

Appendix C

Table C.1 Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Nigeria MIS 2021

	Female		Male			Female		Male	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	1,141	3.2	1,082	3.0	37	284	0.8	257	0.7
1	1,032	2.9	1,183	3.3	38	318	0.9	278	0.8
2	1,170	3.2	1,259	3.5	39	202	0.6	200	0.6
3	1,299	3.6	1,303	3.6	40	792	2.2	987	2.7
4	1,485	4.1	1,609	4.4	41	175	0.5	152	0.4
5	884	2.4	852	2.4	42	245	0.7	255	0.7
6	1,438	4.0	1,554	4.3	43	195	0.5	196	0.5
7	1,217	3.4	1,345	3.7	44	85	0.2	96	0.3
8	1,270	3.5	1,331	3.7	45	470	1.3	700	1.9
9	931	2.6	881	2.4	46	92	0.3	124	0.3
10	1,379	3.8	1,421	3.9	47	121	0.3	172	0.5
11	751	2.1	703	1.9	48	113	0.3	192	0.5
12	1,037	2.9	983	2.7	49	61	0.2	116	0.3
13	1,009	2.8	794	2.2	50	699	1.9	688	1.9
14	928	2.6	729	2.0	51	155	0.4	91	0.3
15	760	2.1	1,143	3.2	52	240	0.7	186	0.5
16	504	1.4	592	1.6	53	222	0.6	114	0.3
17	600	1.7	700	1.9	54	139	0.4	113	0.3
18	697	1.9	814	2.3	55	319	0.9	336	0.9
19	401	1.1	363	1.0	56	108	0.3	153	0.4
20	1,148	3.2	916	2.5	57	81	0.2	108	0.3
21	359	1.0	376	1.0	58	113	0.3	98	0.3
22	451	1.2	436	1.2	59	43	0.1	62	0.2
23	331	0.9	350	1.0	60	353	1.0	467	1.3
24	313	0.9	245	0.7	61	65	0.2	67	0.2
25	1,195	3.3	857	2.4	62	83	0.2	98	0.3
26	408	1.1	256	0.7	63	64	0.2	77	0.2
27	419	1.2	365	1.0	64	50	0.1	56	0.2
28	516	1.4	331	0.9	65	187	0.5	260	0.7
29	277	0.8	205	0.6	66	23	0.1	26	0.1
30	1,314	3.6	1,040	2.9	67	58	0.2	108	0.3
31	213	0.6	184	0.5	68	48	0.1	79	0.2
32	464	1.3	352	1.0	69	30	0.1	37	0.1
33	266	0.7	201	0.6	70+	669	1.9	963	2.7
34	237	0.7	213	0.6	Don't know	96	0.3	184	0.5
35	984	2.7	892	2.5					
36	272	0.8	206	0.6	Total	36,099	100.0	36,159	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, number and percent distribution of interviewed women age 15–49, percentage of eligible women who were interviewed (weighted), by 5-year age groups, and ratios for selected age groups, Nigeria MIS 2021

Age group	Household population of women age 10–54	Interviewed women age 15–49		Percentage of eligible women interviewed
		Number	Percentage	
10–14	5,104	na	na	na
15–19	2,963	2,926	19.4	98.8
20–24	2,602	2,568	17.0	98.7
25–29	2,814	2,778	18.4	98.7
30–34	2,493	2,474	16.4	99.2
35–39	2,060	2,040	13.5	99.0
40–44	1,493	1,482	9.8	99.3
45–49	857	846	5.6	98.7
50–54	1,455	na	na	na
15–49	15,282	15,114	100.0	98.9
Ratios				
10–14 to 15–19	1.72	na	na	na
50–54 to 45–49	1.70	na	na	na

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

Table C.3 Age displacement at ages 14/15

Number of women age 12–18 listed in the household schedule by single-year age and age ratio 15/14, according to zone (weighted), Nigeria MIS 2021

Zone	Age							Total age 12–18	Age ratio (age 15/ age 14)
	12	13	14	15	16	17	18		
North Central	146	135	160	111	66	84	133	835	0.69
North East	170	182	202	150	92	114	144	1,054	0.74
North West	441	416	262	313	186	268	272	2,158	1.20
South East	77	62	69	36	45	31	41	359	0.52
South South	109	103	127	73	64	50	51	577	0.57
South West	106	123	120	84	58	62	74	627	0.70
Total	1,049	1,021	939	767	511	609	715	5,611	0.82

Table C.4 Age displacement at ages 49/50

Number of women age 47–53 listed in the household schedule by single-year age and age ratio 50/49, according to zone (weighted), Nigeria MIS 2021

Zone	Age							Total age 47–53	Age ratio (age 50/ age 49)
	47	48	49	50	51	52	53		
North Central	14	16	13	118	25	50	41	277	8.98
North East	10	9	3	132	22	31	27	234	39.42
North West	46	35	12	176	33	50	63	416	14.54
South East	12	10	11	64	21	38	24	180	5.77
South South	17	15	10	132	30	29	27	259	13.78
South West	24	27	16	84	32	46	43	272	5.14
Total	123	113	66	707	162	243	224	1,637	10.76

Table C.5 Live births by years preceding the survey

Number of live births, percentage with year and month of birth given, sex ratio at birth, and ratio by years preceding the survey, according to living, dead, and total children (weighted), Nigeria MIS 2021

Years preceding survey	Number of live births			Percentage with year and month of birth given			Sex ratio at birth[1]			Ratio of years preceding survey[2]		
	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total
0	1,824	67	1,891	99.9	100.0	99.9	92.8	170.0	94.7	na	na	na
1	2,063	78	2,140	100.0	100.0	100.0	116.2	133.9	116.8	na	na	na
2	2,129	103	2,232	100.0	100.0	100.0	107.1	134.9	108.2	100.2	130.1	101.3
3	2,186	80	2,267	100.0	100.0	100.0	101.1	131.4	102.1	98.7	93.5	98.5
4	2,302	69	2,371	100.0	100.0	100.0	105.0	142.0	106.0	133.0	99.5	131.7
5	1,275	58	1,333	99.9	100.0	99.9	111.9	120.5	112.3	110.8	169.1	112.5
All	11,779	455	12,234	100.0	100.0	100.0	105.2	137.7	106.3	na	na	na

na = Not applicable
[1] (Bm/Bf)x100, where Bm and Bf are the numbers of male and female births, respectively
[2] [2Bx/(Bx-1+Bx+1)]x100, where Bx is the number of births in x years preceding the survey

Table C.6 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Nigeria MIS 2021

Subject	Percentage with information missing	Number of cases
Missing day only (live births in the 5 years preceding the survey)	5.81	12,234
Missing month but year reported (live births in the 5 years preceding the survey)	0.02	12,234
Missing year (live births in the 15 years preceding the survey)	0.00	12,234
Missing month but year reported (women age 15–49)	7.86	14,476
Missing year (women age 15–49)	1.02	14,476
Anaemia (living children age 6–59 months from the Biomarker Questionnaire)	4.01	11,564
Malaria (living children age 6–59 months from the Biomarker Questionnaire)	3.99	11,564

Table C.7 Observation of mosquito nets

Percentage of all mosquito nets observed by the interviewers, according to background characteristics (weighted), Nigeria MIS 2021

Background characteristic	Percentage of mosquito nets observed by interviewers	Number of mosquito nets
Residence		
Urban	72.2	5,583
Rural	77.6	13,126
Zone		
North Central	69.2	2,387
North East	87.4	4,025
North West	79.2	7,395
South East	78.3	1,020
South South	64.1	1,547
South West	59.9	2,335
Wealth quintile		
Lowest	76.7	3,693
Second	81.8	4,073
Middle	78.5	3,889
Fourth	77.6	3,643
Highest	63.6	3,411
Total	76.0	18,709

Table C.8 Number of enumeration areas completed by month of fieldwork and zone

During the period of fieldwork, number of enumeration areas (EAs) completed by month, according to zone, and percent distribution of EAs completed by month, Nigeria MIS 2021

	Month of fieldwork			
Zone	October	November	December	Total
North Central	56	45	0	101
North East	44	45	0	89
North West	42	64	6	112
South East	34	40	0	74
South South	41	52	6	99
South West	43	49	0	92
Percent distribution	45.9	52.0	2.1	100.0
Total	260	295	12	567

Note: EAs are classified by month of fieldwork according to the date by which the last Biomarker Questionnaire in the EA was completed.

Table C.9 Positive rapid diagnostic test (RDT) results by month of fieldwork and zone, Nigeria MIS 2021

Among children age 6–59 months tested for malaria by RDT, percentage who tested positive by month of fieldwork, according to zone, Nigeria MIS 2021

	Percentage of children classified as having malaria by month of fieldwork			
Zone	October	November	December	Total
North Central	30.1	35.1	*	32.3
North East	39.2	47.8	*	43.0
North West	53.0	51.1	41.2	51.6
South East	23.6	30.5	*	27.3
South South	27.1	31.5	41.8	29.9
South West	28.3	20.1	*	24.1
Total	37.3	41.6	41.4	39.6

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases or that there were no children measured for malaria in the zone for the month.

Table C.10 Concordance and discordance between RDT and microscopy results

Percent distribution children age 6–59 months by concordance and discordance between RDT and microscopy test results, Nigeria MIS 2021

	Concordance		Discordance				
	RDT+/ microscopy+	RDT-/ microscopy-	RDT+/ microscopy-	RDT-/ microscopy+	Other[1]	Total percentage	Number of children
Total	17.4	55.9	19.2	2.9	4.6	100.0	11,097

[1] Includes children for whom microscopy results could not be determined because of slide loss, slide breakage, or smear quality

Table C.11 Concordance and discordance between national and external quality control laboratories

Distribution of microscope slides of thick films examined by both the national laboratory and the external quality control (EQC) laboratory, by concordant and discordant results, Nigeria MIS 2021

	National lab and EQC lab results			Number of microscope slides
	Concordant	Discordant	Total percent	
Total	93.1	6.9	100.0	1,064

PERSONS INVOLVED IN THE 2021 NIGERIA MALARIA INDICATOR SURVEY

Appendix **D**

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	Omobhude Ugoeze Chioma	Med. Lab. Sct
	Oguntoyinbo Raimot Adeola	Nurse
LAGOS	Mana Adewale	Supervisor
	Oyetunde Ololade	Interviewer
	Deborah Onyinyechukwu	Interviewer
	Salihu Gambo Moses	Med. Lab. Sct
	Khadija Muhammad Suleiman	Nurse
NASARAWA	Nakre Bello Issac	Supervisor
	Fauziyah Adamu Ibrahim	Interviewer
	Blessing Bob Musa	Interviewer
	Mohammed Shaba Kolo	Med. Lab. Sct
	Hassan Rahmat Wasagi	Nurse
	Jareed Kurama (replaced later by	Interviewer
NIGER	Ezekiel Biko Grace)	
	Maryam Saidu Gwarjiko (replaced	Interviewer
	later by Rachael Danladi)	
	Abubakar Nafisat Aguye	Supervisor
	Sunmola Oyinkansola	Med. Lab. Sct
	Afuwape Olajumoke Fausat	Nurse
OGUN	Odunlami Oyinkasola Omobolaji	Supervisor
	Kuye Ajoke	Interviewer
	Emmanuel Chukwuemeka M.	Interviewer
	Oluwakemi Cecilia Faleye	Med. Lab. Sct
	Oladipupo Olanike Olufunke	Nurse
ONDO	Foluke Omotola Akinbobose	Interviewer
	Taiwo Aishat Shittu	Interviewer
	Iyantan Afolabi Evans	Supervisor
	Oyeniran O Adeola	Med. Lab. Sct
	Adeniji Ademidun	Nurse
OSUN	Adeyemi Gbemisola Funmilayo	Interviewer
	Olushola Kareem	Supervisor
	Abiodun Adebanji Adediran	Interviewer
	Oyetunde Oyebami	Med. Lab. Sct
	Adeleke Elizabeth Ebelechukwu	Nurse
OYO	Akinware Opeyemi Oluwabunmi	Interviewer
	Seun-Addie Kehinde	Supervisor
	Iyabo Evelyn Aramide	Interviewer

	Dimlong Moses Y	Med. Lab. Sct
	Ejah Susan Akusu	Nurse
PLATEAU	Busayo Ajayi	Interviewer
	Aduli Grace Othniel	Supervisor
	Gwammen Dorcas D	Interviewer
	Tonye Bongili	Med. Lab. Sct
	Sukariba Matthew Onyemaechi	Nurse
RIVERS	Joycelyn Ibama Sunday	Interviewer
	Ibiyekura Harry C	Supervisor
	Onwuchekwa Amarachi Faith	Interviewer
	Muhammad Murtala Namadina	Med. Lab. Sct
	Marwana Umar	Nurse/Supervisor
SOKOTO	Fatima Aliyu Dogon Daji	Interviewer
	Lubabatu Yayaji	Interviewer
	Shamsiya Muhammad	Interviewer
	Gemson Simon Isa Linus	Med. Lab. Sct
	John D. Adamu	Nurse
TARABA	Judith Hadiza Dame	Interviewer
	Aliyu Mohammed Hurso	Supervisor
	Sumayyat Abubakar Sale	Interviewer
	Musa Liman	Med. Lab. Sct
	Mohammed Bukar	Nurse
YOBE	Zarah Ahmad Yusuf	Interviewer
	Ya Gumsu Shehu Mustapha	Supervisor
	Dauda Umar Maikau	Interviewer
	Sani Suleman Gusau	Med. Lab. Sct
	Sani Aliyu	Nurse
ZAMFARA	Munira Aminu Gullah	Supervisor
	Sadiya Ahmad Gusau	Interviewer
	Mohammed Mu’azu	Interviewer

BONNY ISLAND ESTIMATES

Appendix E

The 2021 NMIS was designed to provide baseline information on malaria parasite prevalence and other malaria indicators for Bonny Island, which lies in Rivers State. A total of 25 clusters were selected from Rivers State, with eight clusters selected from Bonny Island and the remaining 17 from the other local government areas (LGAs) of the state.

This appendix represents the survey results for Bonny Island. **Table E.1** shows the final report table number, indicator, category, weighted value, weighted number, and unweighted number for each of the indicators calculated for Bonny Island. Note that footnotes corresponding to the variables and categories are not provided. See the corresponding final report table for footnotes.

Figure E.1 shows the indicator "Percentage of households with at least one ITN" as an example. It can be interpreted as follows: 34% of households in Bonny Island have at least one insecticide-treated mosquito net (ITN). More information about the definition of an ITN can be found by referencing the footnotes in **Table 3.1.1**. In total, 199 households were interviewed in Bonny Island as part of the 2021 NMIS. However, the weighted number of households is eight (out of 13,727 in the survey overall), which reflects the small percentage of households in Bonny Island relative to the total number of households in the 2021 NMIS.

Figure E.1 **How to read the Bonny Island table**

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
3.1.1	Percentage of households with at least one mosquito net	Insecticide-treated mosquito net (ITN)	34.3	8	199

For more information about weighted and unweighted numbers, see Reading and Understanding Tables from the 2021 Nigeria Malaria Indicator Survey (NMIS) at the front of the report.

Table E.1 NMIS indicators for Bonny Island

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
2.2	Percent distribution of de jure population by drinking water service ladder	At least basic service	64.8	27	692
2.2	Percent distribution of de jure population by drinking water service ladder	Limited service	14.0	27	692
2.2	Percent distribution of de jure population by drinking water service ladder	Unimproved	21.2	27	692
2.2	Percent distribution of de jure population by drinking water service ladder	Surface water	0.0	27	692
2.4	Percent distribution of de jure population by type of sanitation service	At least basic service	50.5	27	692
2.4	Percent distribution of de jure population by type of sanitation service	Limited service	24.9	27	692
2.4	Percent distribution of de jure population by type of sanitation service	Unimproved	4.2	27	692
2.4	Percent distribution of de jure population by type of sanitation service	Open defecation	20.3	27	692
2.8	Wealth quintile	Lowest	0.0	27	692
2.8	Wealth quintile	Second	0.0	27	692
2.8	Wealth quintile	Middle	0.7	27	692
2.8	Wealth quintile	Fourth	33.6	27	692
2.8	Wealth quintile	Highest	65.7	27	692
2.11.1	Percent distribution of women age 15–49		0.0	6	173
2.12.1	Highest level of schooling attended or completed	No education	1.2	6	173
2.12.1	Highest level of schooling attended or completed	Some primary	1.3	6	173
2.12.1	Highest level of schooling attended or completed	Completed primary	5.1	6	173
2.12.1	Highest level of schooling attended or completed	Some secondary	11.6	6	173
2.12.1	Highest level of schooling attended or completed	Completed secondary	50.6	6	173
2.12.1	Highest level of schooling attended or completed	More than secondary	30.1	6	173
2.12.1	Highest level of schooling attended or completed	Median years completed	11.6	6	173
2.13.1	Percentage of women who attended informal schooling		*	0	2
2.13.1	Type of informal schooling attended	Adult education	*	0	0
2.13.1	Type of informal schooling attended	Tsangaya	*	0	0
2.13.1	Type of informal schooling attended	Quranic	*	0	0
2.14.1	Level of literacy	Higher than secondary schooling	30.1	6	173
2.14.1	Level of literacy	Can read a whole sentence	50.9	6	173
2.14.1	Level of literacy	Can read part of a sentence	9.3	6	173
2.14.1	Level of literacy	Cannot read at all	9.6	6	173
2.14.1	Level of literacy	No card with required language	0.0	6	173
2.14.1	Level of literacy	Blind/visually impaired	0.0	6	173
2.14.1	Percentage literate		90.4	6	173
2.15	Percentage of women age 15–49 who are exposed to specific media on a weekly basis	Reads a newspaper at least once a week	10.3	6	173
2.15	Percentage of women age 15–49 who are exposed to specific media on a weekly basis	Watches television at least once a week	95.1	6	173
2.15	Percentage of women age 15–49 who are exposed to specific media on a weekly basis	Listens to the radio at least once a week	42.7	6	173
2.15	Percentage of women age 15–49 who are exposed to specific media on a weekly basis	Accesses all three media at least once a week	7.3	6	173
2.15	Percentage of women age 15–49 who are exposed to specific media on a weekly basis	Accesses none of the three media at least once a week	3.6	6	173
2.16	Mobile phone ownership and Internet usage	Owns any mobile phone	85.9	6	173
2.16	Mobile phone ownership and Internet usage	Owns a smart phone	49.6	6	173
2.16	Mobile phone ownership and Internet usage	Ever used the Internet	65.5	6	173
2.16	Mobile phone ownership and Internet usage	Used the Internet in the past 12 months	54.3	6	173
2.16	Internet usage in the past month	Almost every day	75.7	4	96
2.16	Internet usage in the past month	At least once a week	8.4	4	96
2.16	Internet usage in the past month	Less than once a week	14.6	4	96
2.16	Internet usage in the past month	Not at all	1.4	4	96
3.1.1	Percentage of households with at least one mosquito net	Any mosquito net	34.3	8	199
3.1.1	Percentage of households with at least one mosquito net	Insecticide-treated mosquito net (ITN)	34.3	8	199
3.1.1	Average number of nets per household	Any mosquito net	0.4	8	199
3.1.1	Average number of nets per household	Insecticide-treated mosquito net (ITN)	0.4	8	199
3.1.1	Percentage of households with at least one net for every two persons who stayed in the household last night	Any mosquito net	13.2	8	199
3.1.1	Percentage of households with at least one net for every two persons who stayed in the household last night	Insecticide-treated mosquito net (ITN)	13.2	8	199
3.2.1	Percent distribution of mosquito nets by source of net	Mass distribution campaign	42.7	4	90
3.2.1	Percent distribution of mosquito nets by source of net	ANC visit	7.7	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Immunisation visit	11.1	4	90

Continued…

Table E.1—*Continued*

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
3.2.1	Percent distribution of mosquito nets by source of net	Government health facility	2.2	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Private health facility	0.0	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Pharmacy	0.0	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Shop/market	24.5	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Community health worker	0.0	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Religious institution	0.0	4	90
3.2.1	Percent distribution of mosquito nets by source of net	School	0.0	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Other	11.7	4	90
3.2.1	Percent distribution of mosquito nets by source of net	Don't know	0.0	4	90
3.3.1	Percentage of the de facto population with access to an ITN		23.3	27	692
3.4.1	Percentage of the de facto household population that slept under a mosquito net last night	Any mosquito net	13.9	27	692
3.4.1	Percentage of the de facto household population that slept under a mosquito net last night	Insecticide-treated mosquito net (ITN)	13.9	27	692
3.4.1	Percentage of the de facto population that slept under an ITN last night in households with at least one ITN		36.0	11	269
3.5.1	Percentage of existing ITNs used last night		61.4	4	90
3.6.1	Percentage of children under age 5 who slept under a mosquito net last night	Any mosquito net	15.7	4	95
3.6.1	Percentage of children under age 5 who slept under a mosquito net last night	Insecticide-treated mosquito net (ITN	15.7	4	95
3.6.1	Percentage of children under age 5 who slept under an ITN last night in households with at least one ITN		(36.9)	2	40
3.7.1	Percentage of pregnant women who slept under a mosquito net last night	Any mosquito net	*	1	19
3.7.1	Percentage of pregnant women who slept under a mosquito net last night	Insecticide-treated mosquito net (ITN)	*	1	19
3.7.1	Percentage of pregnant women who slept under a mosquito net last night in households with at least one ITN		*	0	10
3.8.1	Percentage of nets not used the night before the survey		38.6	4	90
3.8.1	Reason net not used the night before the survey	No mosquitoes	(2.0)	1	33
3.8.1	Reason net not used the night before the survey	No malaria	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Too hot	(4.5)	1	33
3.8.1	Reason net not used the night before the survey	Don't like smell	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Feel "closed in"	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Net too old/torn	(62.8)	1	33
3.8.1	Reason net not used the night before the survey	Net too dirty	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Net not available last night (washing)	(5.7)	1	33
3.8.1	Reason net not used the night before the survey	Usual users did not sleep here last night	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Net not needed last night	(22.2)	1	33
3.8.1	Reason net not used the night before the survey	Bed bugs	(0.0)	1	33
3.8.1	Reason net not used the night before the survey	Other	(2.8)	1	33
3.8.1	Reason net not used the night before the survey	Don't know	(0.0)	1	33
3.9.1	Antenatal care provider	Doctor	*	1	22
3.9.1	Antenatal care provider	Nurse/midwife	*	1	22
3.9.1	Antenatal care provider	Auxiliary midwife	*	1	22
3.9.1	Antenatal care provider	Community extension health worker	*	1	22
3.9.1	Antenatal care provider	Traditional birth attendant	*	1	22
3.9.1	Antenatal care provider	Community health worker/ fieldworker	*	1	22
3.9.1	Antenatal care provider	Other	*	1	22
3.9.1	Antenatal care provider	No ANC	*	1	22
3.9.1	Antenatal care provider	Percentage receiving antenatal care from a skilled provider	*	1	22
3.10.1	Number of ANC visits	None	*	1	22
3.10.1	Number of ANC visits	1	*	1	22
3.10.1	Number of ANC visits	2	*	1	22
3.10.1	Number of ANC visits	3	*	1	22
3.10.1	Number of ANC visits	4–7	*	1	22
3.10.1	Number of ANC visits	8+	*	1	22
3.10.1	Number of ANC visits	Don't know	*	1	22
3.10.1	Number of ANC visits	4+ ANC visits	*	1	22
3.10.1	Number of months pregnant at time of first ANC visit	No antenatal care	*	1	22
3.10.1	Number of months pregnant at time of first ANC visit	<4	*	1	22

Continued…

Table E.1—*Continued*

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
3.10.1	Number of months pregnant at time of first ANC visit	4–7	*	1	22
3.10.1	Number of months pregnant at time of first ANC visit	7+	*	1	22
3.10.1	Number of months pregnant at time of first ANC visit	Don't know	*	1	22
3.10.1	Number of months pregnant at time of first ANC visit	Median months pregnant at first visit (for those with ANC)	4.8	1	22
3.11.1	Use of intermittent preventive treatment (IPTp)	Percentage who received one or more doses of SP/Fansidar	*	1	22
3.11.1	Use of intermittent preventive treatment (IPTp)	Percentage who received two or more doses of SP/Fansidar	*	1	22
3.11.1	Use of intermittent preventive treatment (IPTp)	Percentage who received three or more doses of SP/Fansidar	*	1	22
4.1.1	Percentage of children under age 5 with a fever in the 2 weeks preceding the survey		35.0	4	80
4.1.1	Percentage of children under age 5 with fever for whom advice or treatment was sought		*	1	19
4.1.1	Percentage of children under age 5 with fever for whom advice or treatment was sought the same or next day		*	1	19
4.1.1	Percentage of children under age 5 with fever who had blood taken from a finger or heel for testing		*	1	19
4.1.1	Percentage of children under age 5 with fever who were diagnosed with malaria by a health care provider		*	1	19
4.2	Percentage of children under age 5 with a fever for whom advice or treatment was sought who were referred to a higher level of care		*	1	12
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Any ACT	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	SP/Fansidar	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Chloroquine	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Amodiaquine	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Quinine pills	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Quinine injection/IV	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Artesunate rectal	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Artesunate injection/IV	*	0	8
4.4	Among children under age 5 with a fever for whom advice or treatment was sought, percentage who took	Other antimalarial	*	0	8
4.5	Percentage of children whose fever went away after taking ACT		*	0	6
4.6.1	Percentage of eligible children age 6–59 months who were tested for	Anaemia	100.0	88	88
4.6.1	Percentage of eligible children age 6–59 months who were tested for	Malaria with RDT	100.0	88	88
4.6.1	Percentage of eligible children age 6–59 months who were tested for	Malaria by microscopy	100.0	88	88
4.7.1	Percentage of children age 6–59 months with haemoglobin lower than 8.0 g/dl	Haemoglobin <8.0 g/dl	0.7	4	88
4.8.1	Malaria prevalence	RDT positive	41.5	4	88
4.8.1	Malaria prevalence	Microscopy positive	0.0	4	88
4.9.1	Percent distribution by species of *Plasmodium*	Positive for *Pf* only	*	0	0
4.9.1	Percent distribution by species of *Plasmodium*	Positive for *Pm* only	*	0	0
4.9.1	Percent distribution by species of *Plasmodium*	Positive for *Po* only	*	0	0
4.9.1	Percent distribution by species of *Plasmodium*	Positive for *Pf* + *Po*	*	0	0
4.9.1	Percent distribution by species of *Plasmodium*	Positive for *Pf* + *Pm*	*	0	0

Continued…

Table E.1—*Continued*

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
5.1.1	Percentage who have seen or heard a malaria message in the past 6 months		61.7	6	173
5.1.1	Source of exposure to malaria messages in the past 6 months	Radio	33.9	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Television	43.5	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Poster/billboard	0.0	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Newspaper/magazine	0.6	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Leaflet/brochure	3.9	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Health care provider	9.4	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Community health worker	8.7	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Social media	17.8	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Town announcer	0.6	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Interpersonal communication agent/community volunteer	22.5	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Family/friends	16.6	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Other	0.0	4	105
5.1.1	Source of exposure to malaria messages in the past 6 months	Don't remember	0.0	4	105
5.2.1	Percentage who state there are ways to avoid getting malaria		81.0	6	173
5.2.1	Ways to avoid getting malaria	Sleep under mosquito net or ITN	77.2	5	138
5.2.1	Ways to avoid getting malaria	Use mosquito repellent	12.3	5	138
5.2.1	Ways to avoid getting malaria	Take preventive medications	5.5	5	138
5.2.1	Ways to avoid getting malaria	Spray house with insecticide	13.2	5	138
5.2.1	Ways to avoid getting malaria	Fill in stagnant water (puddles)	31.2	5	138
5.2.1	Ways to avoid getting malaria	Keep surroundings clean	54.9	5	138
5.2.1	Ways to avoid getting malaria	Put mosquito screen on windows	4.9	5	138
5.2.1	Ways to avoid getting malaria	Other	5.7	5	138
5.2.1	Ways to avoid getting malaria	Don't know	1.1	5	138
5.3.1	Percentage who disagree that people in the community get malaria only during the rainy season	Perceived susceptibility	75.3	6	173
5.3.1	Percentage who agree that when a child has a fever they almost always worry it might be malaria		85.1	6	173
5.3.1	Percentage who perceive that their families and communities are at risk from malaria		96.1	6	173
5.3.1	Percentage who disagree that getting malaria is not a problem because it can be easily treated		56.6	6	173
5.3.1	Percentage who disagree that only weak children can die from malaria		74.6	6	173
5.3.1	Percentage who feel that the consequences of malaria are serious		81.4	6	173
5.3.1	Percentage who agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes		87.1	6	173
5.3.1	Percentage who agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes		71.6	6	173
5.3.1	Percentage who are confident in their ability to perform specific malaria-related behaviours		87.1	6	173
5.4.1	Percentage who disagree that they do not like sleeping under a mosquito net when the weather is too warm		63.8	6	173
5.4.1	Percentage who disagree that when a child has a fever, it is best to start giving the child any medicine that you have at home		85.8	6	173
5.4.1	Percentage who agree that it is important that children take the full dose of medicine that they are prescribed for malaria		98.7	6	173
5.4.1	Percentage who have a favourable attitude toward specific malaria-related behaviours		100.0	6	173

Continued…

Table E.1—*Continued*

Final report table number	Indicator	Category	Weighted value	Weighted number	Unweighted number
5.4.1	Percentage who agree that people in the community usually take their children to a health care provider on the same day or the day after they develop a fever		42.7	6	173
5.4.1	Percentage who agree that people in the community who have a mosquito net usually sleep under a mosquito net every night		34.8	6	173
5.4.1	Percentage who believe the majority of people in their community currently practise specific malaria-related behaviours		57.0	6	173

Note: 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.

QUESTIONNAIRES

Appendix **F**

FORMATTING DATE: 1 Jan 2021
ENGLISH LANGUAGE: 23 Aug 2021

NIGERIA MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

NIGERIA
NATIONAL MALARIA ELIMINATION PROGRAMME
NATIONAL POPULATION COMMISSION

IDENTIFICATION

STATE _____

LOCAL GOV'T AREA _____

LOCALITY _____

ENUMERATION AREA _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . | | | | |

HOUSEHOLD NUMBER . . . . . | | | | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
				YEAR
INTERVIEWER'S 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

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

LANGUAGE OF QUESTIONNAIRE** 0 1 | LANGUAGE OF INTERVIEW** | | NATIVE LANGUAGE OF RESPONDENT** | | TRANSLATOR USED (YES = 1, NO = 2)

LANGUAGE OF QUESTIONNAIRE** **ENGLISH**

**LANGUAGE CODES:
01 ENGLISH
02 HAUSA
03 YORUBA
04 IGBO
06 OTHER

TEAM NUMBER

TEAM SUPERVISOR NAME _____ NUMBER

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INTRODUCTION AND CONSENT

Greetings. My name is _____. I am working with the National Malaria Elimination Program and the National Population Commission. We are conducting a survey about malaria all over Nigeria. The information we collect will help the government to plan health services. Your household was selected for the survey. I would like to ask you some questions about your household. The questions usually take about 15-20 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you 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. In case you need more information about the survey, you may contact the following persons:

National Malaria Elimination Program Contact Person: Dr. Perpetua Uhomoibhi; Phone number: 08059121416
National Population Commission Contact Person: Mrs. Bintu Abba; Phone number: 08033138277
National Health Research Ethics Committee Contact Person: NHREC Secretary; Email: secretary@nhrec.net
NHREC Desk Officer; Email: deskofficer@nhrec.net
Phone number: 095238367
Health Strategy and Delivery Foundation Contact Person: Dr. Ify Aniebo; Phone number: 09063727555

IF INTERESTED, ALLOW RESPONDENT TO COPY CONTACT INFORMATION

We also are taking measures to reduce the risk of transmission of COVID-19, including wearing face masks, keeping a distance of 2 meters from respondents to the survey, and washing our hands frequently.

Do you have any questions?
May I begin the interview now?

SIGNATURE OF INTERVIEWER _____ DATE _____

RESPONDENT AGREES TO BE INTERVIEWED . . 1

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

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

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBILITY	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	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 ASKING QUESTIONS 2-7 FOR EACH PERSON ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female? M F 1 2	Does (NAME) usually live here? Y N 1 2	Did (NAME) stay here last night? Y N 1 2	How old is (NAME)? IN YEARS IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
01			1 2	1 2	1 2		01	01
02			1 2	1 2	1 2		02	02
03			1 2	1 2	1 2		03	03
04			1 2	1 2	1 2		04	04
05			1 2	1 2	1 2		05	05
06			1 2	1 2	1 2		06	06
07			1 2	1 2	1 2		07	07
08			1 2	1 2	1 2		08	08
09			1 2	1 2	1 2		09	09
10			1 2	1 2	1 2		10	10

2A)	Just to make sure that I have a complete listing: are there any other people such as small children or infants that we have not listed?	YES ☐ →	ADD TO TABLE	NO ☐
2B)	Are there any other people who may not be members of your family, such as domestic servants, lodgers, or friends who usually live here?	YES ☐ →	ADD TO 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 ☐ →	ADD TO TABLE	NO ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/ STEPCHILD
11 = NOT RELATED
12 = CO-WIFE
98 = DON'T KNOW

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBILITY	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	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 ASKING QUESTIONS 2-7 FOR EACH PERSON ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5

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 . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 105 → 103 → 103
102	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 OTHER _____ 96 (SPECIFY)	→ 105
103	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 105
104	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
105	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)	→ 109
106	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	→ 108
107	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	
108	Where is this toilet facility located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	
109	In your household, what type of cookstove is MAINLY used for cooking?	ELECTRIC STOVE . . . . . 01 SOLAR COOKER . . . . . 02 LIQUIFIED PETROLEUM GAS (LPG)/ COOKING GAS STOVE . . . . . 03 PIPED NATURAL GAS STOVE . . . . . 04 BIOGAS STOVE . . . . . 05 KEROSENE STOVE . . . . . 06 MANUFACTURED SOLID FUEL STOVE . . . . 07 TRADITIONAL SOLID FUEL STOVE . . . . . 08 THREE STONE STOVE/OPEN FIRE . . . . . 09 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	→ 111 → 111
110	What type of fuel or energy source is used in this cookstove?	ALCOHOL/ETHANOL . . . . . 01 GASOLINE/DIESEL . . . . . 02 KEROSENE/PARAFFIN . . . . . 03 COAL/LIGNITE . . . . . 04 CHARCOAL . . . . . 05 WOOD . . . . . 06 STRAW/SHRUBS/GRASS . . . . . 07 AGRICULTURAL CROP . . . . . 08 ANIMAL DUNG/WASTE . . . . . 09 PROCESSED BIOMASS (PELLETS) OR WOODCHIPS . . . . . 10 GARBAGE/PLASTIC . . . . . 11 SAWDUST . . . . . 12 OTHER _____ 96 (SPECIFY)	
111	How many rooms in this household are used for sleeping?	ROOMS . . . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 114
113	How many of the following animals does this household own? IF NONE, RECORD '00'. IF 95 OR MORE, RECORD '95'. IF UNKNOWN, RECORD '98'.		
	a) Milk cows or bulls?	a) COWS/BULLS	
	b) Other cattle?	b) OTHER CATTLE	
	c) Horses, donkeys, or mules?	c) HORSES/DONKEYS/MULES	
	d) Goats?	d) GOATS	
	e) Sheep?	e) SHEEP	
	f) Chickens or other poultry?	f) CHICKENS/POULTRY	
	g) Pigs?	g) PIGS	
	h) Camels?	h) CAMELS	
114	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 116
115	How many plots/acres/hectares of agricultural land do members of this household own?	PLOT . . . . . 01 .	
		ACRES . . . . . 02 .	
		HECTARES . . . . . 03 .	
	IF 95 OR MORE, CIRCLE '950'.	95 OR MORE PLOTS/ACRES/HECTARES . . 950 DON'T KNOW 998	
116	Does your household have:	YES NO	
	a) Electricity?	a) ELECTRICITY 1 2	
	b) A radio?	b) RADIO 1 2	
	c) A television?	c) TELEVISION 1 2	
	d) A non-mobile telephone?	d) NON-MOBILE TELEPHONE . . 1 2	
	e) A computer?	e) COMPUTER 1 2	
	f) A refrigerator?	f) REFRIGERATOR 1 2	
	g) A table?	g) TABLE 1 2	
	h) A chair?	h) CHAIR 1 2	
	i) A bed?	i) BED 1 2	
	j) A sofa?	j) SOFA 1 2	
	k) A cupboard?	k) CUPBOARD 1 2	
	l) An air conditioner?	l) AIR CONDITIONER 1 2	
	m) An electric iron?	m) ELECTRIC IRON 1 2	
	n) A generator?	n) GENERATOR 1 2	
	o) A fan?	o) FAN 1 2	
117	Does any member of this household own:	YES NO	
	a) A watch?	a) WATCH 1 2	
	b) A mobile phone?	b) MOBILE PHONE 1 2	
	c) A bicycle?	c) BICYCLE 1 2	
	d) A motorcycle or motor scooter?	d) MOTORCYCLE/SCOOTER . . 1 2	
	e) An animal-drawn cart?	e) ANIMAL-DRAWN CART 1 2	
	f) A car or truck?	f) CAR/TRUCK 1 2	
	g) A boat with a motor?	g) BOAT WITH MOTOR 1 2	
	h) A canoe?	h) CANOE 1 2	
	i) A keke napep?	I) KEKE NAPEP 1 2	
118	Does any member of this household have an account in a bank or other financial institution?	YES . . . . . 1 NO 2	

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
119	Does any member of this household use a mobile phone to make financial transactions such as sending or receiving money, paying bills, purchasing goods or services, or receiving wages?	YES . . . . . 1 NO 2	
120	Does your household have any mosquito nets?	YES . . . . . 1 NO 2	→ 132
121	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . ☐	

MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD. OBSERVE AND ANSWER THE QUESTIONS FOR EACH NET, ONE BY ONE.		
122	ASSIGN EACH NET A SEQUENTIAL NUMBER AND RECORD THE NUMBER HERE.	NET NUMBER . . . . . [ ]	
123	WAS THIS NET OBSERVED?	OBSERVED . . . . . 1 NOT OBSERVED 2	
124	How many months ago did your household get the mosquito net? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . . . 95 NOT SURE 98	
125	OBSERVE OR ASK BRAND/TYPE 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 YORKOOL . . . . . 17 MAGNET . . . . . 18 DAWAPLUS 2.0 . . . . . 19 ROYAL SECURITY . . . . . 20 ROYAL SENTRY . . . . . 21 PERMANET 2.0 . . . . . 22 PERMANET 3.0 . . . . . 23 VEERALIN . . . . . 24 INTERCEPTOR G2 . . . . . 25 ROYAL GUARD . . . . . 26 OTHER/DON'T KNOW BRAND (LLIN) . . . . 36 OTHER TYPE (NOT LLIN) . . . . . 96 DON'T KNOW TYPE 98	
126	Did you get the net through a mass distribution campaign, during an antenatal care visit, or during an immunization visit?	YES, MASS DISTRIBUTION CAMPAIGN . . . . . 1 YES, ANC . . . . . 2 YES, IMMUNIZATION VISIT . . . . . 3 NO 4	→ 128
127	Where did you get the net?	GOVERNMENT HEALTH FACILITY . . . . . 01 PRIVATE HEALTH FACILITY . . . . . 02 PHARMACY . . . . . 03 SHOP/MARKET . . . . . 04 CHW . . . . . 05 RELIGIOUS INSTITUTION . . . . . 06 SCHOOL . . . . . 07 OTHER _____ 96 SPECIFY DON'T KNOW 98	
128	Did anyone sleep inside this mosquito net last night?	YES . . . . . 1 NO . . . . . 2 NOT SURE 8	→ 130 → 131

MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
129	Who slept inside this mosquito net last night? RECORD THE PERSON'S NAME AND LINE NUMBER FROM HOUSEHOLD SCHEDULE.	NAME _____ LINE NUMBER . . . . . [ ][ ] NAME _____ LINE NUMBER . . . . . [ ][ ] NAME _____ LINE NUMBER . . . . . [ ][ ] NAME _____ LINE NUMBER . . . . . [ ][ ]	→ 131
130	What was the MAIN REASON this net was not used last night?	NO MOSQUITOES . . . . . 01 NO MALARIA . . . . . 02 TOO HOT . . . . . 03 DON'T LIKE SMELL . . . . . 04 FEEL `CLOSED IN' . . . . . 05 NET TOO OLD/TORN . . . . . 06 NET TOO DIRTY . . . . . 07 NET NOT AVAILABLE LAST NIGHT (WASHING) . . . . . 08 USUAL USERS DID NOT SLEEP HERE LAST NIGHT . . . . . 09 NET NOT NEEDED LAST NIGHT . . . . . 10 BED BUGS . . . . . 11 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
131	GO BACK TO 122 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 132.		

ADDITIONAL HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
132	OBSERVE MAIN MATERIAL OF THE FLOOR OF THE DWELLING. RECORD OBSERVATION.	**NATURAL FLOOR** EARTH/SAND . . . . . 11 DUNG . . . . . 12 **RUDIMENTARY FLOOR** WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 **FINISHED FLOOR** PARQUET OR POLISHED WOOD . . . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
133	OBSERVE MAIN MATERIAL OF THE ROOF OF THE DWELLING. RECORD OBSERVATION.	**NATURAL ROOFING** NO ROOF . . . . . 11 THATCH/PALM LEAF . . . . . 12 GRASS . . . . . 13 **RUDIMENTARY ROOFING** RUSTIC MAT . . . . . 21 PALM/BAMBOO . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 **FINISHED ROOFING** METAL/ZINC . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 ASBESTOS . . . . . 37 OTHER _____ 96 (SPECIFY)	
134	OBSERVE MAIN MATERIAL OF THE EXTERIOR WALLS OF THE DWELLING. 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)	
135	RECORD THE TIME.	HOURS . . . . . ☐☐ MINUTES . . . . . ☐☐	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

FORMATTING DATE: 21 Oct 2020
ENGLISH LANGUAGE: 23 Mar 2020

NIGERIA MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

NIGERIA
NATIONAL MALARIA ELIMINATION PROGRAMME
NATIONAL POPULATION COMMISSION

IDENTIFICATION

STATE _____

LOCAL GOV'T AREA _____

LOCALITY _____

ENUMERATION AREA _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . | | | | |

HOUSEHOLD NUMBER . . . . . | | | | |

NAME AND LINE NUMBER OF WOMAN _____ | | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY | | MONTH | | YEAR | | | |
INTERVIEWER'S 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** 0 1 | LANGUAGE OF INTERVIEW** | | | NATIVE LANGUAGE OF RESPONDENT** | | | TRANSLATOR USED (YES = 1, NO = 2) |

LANGUAGE OF QUESTIONNAIRE** **ENGLISH**

**LANGUAGE CODES:
01 ENGLISH; 02 HAUSA; 03 YORUBA; 04 IGBO; 06 OTHER

TEAM NUMBER | |

TEAM SUPERVISOR
_____ NAME
| | | | | NUMBER

INTRODUCTION AND CONSENT

Greetings. My name is _____. I am working with the National Malaria Elimination Program and the National Population Commission. We are conducting a survey about malaria all over Nigeria. The information we collect will help the government to plan health services. Your household was selected for the survey. The questions usually take about 30 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you 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.

As part of this survey, we are also asking children 6 months through 4 years all over the country to take a combined malaria and anaemia testing and give a few drops of blood from a finger or heel. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anaemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. 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 malaria and anaemia immediately, and the result will be told to you right away. A few blood drops will also be collected on slides and on filter paper and taken to a laboratory for malaria testing. You will not be told the results of the laboratory testing. We would like to ask you to allow for storing part of the blood sample at the laboratory for additional tests or research. The blood sample will not have any name or other data attached that could identify you. The results will be kept strictly confidential and will not be shared with anyone other than members of our survey team.

Lastly, we are taking measures to reduce the risk of transmission of COVID-19, including wearing face masks, keeping a distance of 2 meters from respondents to the survey, and washing our hands frequently.

In case you need more information about the survey, you may contact the following persons:

National Malaria Elimination Program Contact Person: Dr. Perpetua Uhomoibhi; Phone number: 08059121416
National Population Commission Contact Person: Mrs. Bintu Abba; Phone number: 08033138277
National Health Research Ethics Committee Contact Person: NHREC Secretary; Email: secretary@nhrec.net
NHREC Desk Officer; Email: deskofficer@nhrec.net
Phone number: 095238367
Health Strategy and Delivery Foundation Contact Person: Dr. Ify Aniebo; Phone number: 09063727555

IF INTERESTED, ALLOW RESPONDENT TO COPY CONTACT INFORMATION

Do you have any questions?
May I begin the interview now?

SIGNATURE OF INTERVIEWER _____ DATE _____

RESPONDENT AGREES TO BE INTERVIEWED . . 1 ↓

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

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOURS . . . . . [ ][ ] 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	→ 105
104A	Have you had any informal education?	YES . . . . . 1 NO 2	→ 108
104B	What type of informal education have you attended?	ADULT EDUCATION . . . . . 1 TSANGAYA . . . . . 2 QUARANIC 3	→ 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 LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	CLASS/FORM/YEAR . . . . . [ ][ ]	

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
107	CHECK 105: PRIMARY OR SECONDARY ☐ ↓	HIGHER ☐ →	110
108	Now I would like you to read this sentence to me. SHOW 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 PART OF THE SENTENCE . . . . . 2 ABLE TO READ WHOLE SENTENCE . . . . . 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	CHECK 108: CODE '2', '3' OR '4' CIRCLED ☐ ↓	CODE '1' OR '5' CIRCLED ☐ →	111
110	Do you read a newspaper or magazine at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
111	Do you listen to the radio at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
112	Do you watch television at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
113	Do you own a mobile phone?	YES . . . . . 1 NO . . . . . 2 →	115
114	Is your mobile phone a smart phone?	YES . . . . . 1 NO 2	
115	Have you ever used the Internet from any location on any device?	YES . . . . . 1 NO . . . . . 2 →	118
116	In the last 12 months, have you used the Internet? IF NECESSARY, PROBE FOR USE FROM ANY LOCATION, WITH ANY DEVICE.	YES . . . . . 1 NO . . . . . 2 →	118
117	During the last one month, how often did you use the Internet: almost every day, at least once a week, less than once a week, or not at all?	ALMOST EVERY DAY . . . . . 1 AT LEAST ONCE A WEEK . . . . . 2 LESS THAN ONCE A WEEK . . . . . 3 NOT AT ALL 4	
118	What is your religion?	CATHOLIC . . . . . 01 OTHER CHRISTIAN . . . . . 02 ISLAM . . . . . 03 TRADITIONALIST . . . . . 04 OTHER _____ 96 (SPECIFY)	
119	What is your ethnic group?	_____ ☐☐☐ (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	a) How many sons live with you? b) And how many daughters live with you? IF NONE, RECORD '00'.	a) SONS AT HOME . . . . . ☐☐ b) 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	a) How many sons are alive but do not live with you? b) And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	a) SONS ELSEWHERE . . . . . ☐☐ b) 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	a) How many boys have died? b) And how many girls have died? IF NONE, RECORD '00'.	a) BOYS DEAD . . . . . ☐☐ b) GIRLS DEAD . . . . . ☐☐	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL LIVE 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.		
210	CHECK 208: ONE OR MORE BIRTHS ☐ NO BIRTHS ☐		→ 224
211	Now I'd like to ask you about your more recent births. How many births have you had in 2016-2021? RECORD NUMBER OF LIVE BIRTHS IN 2016-2021.	TOTAL IN 2016-2021 . . . . . ☐☐ NONE 00	→ 224

SECTION 2. REPRODUCTION

212 Now I would like to record the names of all your births in 2016-2021, whether still alive or not, starting with the most recent one you had.
RECORD IN 213 THE NAMES OF ALL THE BIRTHS BORN IN 2016-2021. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS. IF THERE ARE MORE THAN 5 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE STARTING WITH THE SECOND ROW.

213 What name was given to your (most recent/ previous) baby? RECORD NAME. BIRTH HISTORY NUMBER.	214 Is (NAME) a boy or a girl?	215 Was that a single or multiple pregnancy?	216 On what day, month, and year was (NAME) born?	217 Is (NAME) still alive?	218 IF ALIVE: How old was (NAME) at (NAME)'s last birthday? RECORD AGE IN COMP-LETED YEARS.	219 IF ALIVE: Is (NAME) living with you?	220 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD. RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD.	221 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 → (SKIP TO 221)	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 → (SKIP TO 221)	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 → (SKIP TO 221)	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 → (SKIP TO 221)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER	YES 1 (ADD BIRTH) NO . . . . . 2 (NEXT BIRTH)

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
222	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)?"	YES . . . . . 1 → (RECORD BIRTH(S) IN TABLE) NO 2	
223	COMPARE 211 WITH NUMBER OF BIRTHS IN BIRTH HISTORY NUMBERS ARE THE SAME ☐ ↓ NUMBERS ARE DIFFERENT ☐ → (PROBE AND RECONCILE)		
224	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 301
225	How many weeks or months pregnant are you? RECORD NUMBER OF COMPLETED WEEKS OR MONTHS.	WEEKS . . . . . 1 ☐☐ MONTHS . . . . . 2 ☐☐	

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	CHECK 216 AND 218: ONE OR MORE BIRTHS 0-35 MONTHS BEFORE THE SURVEY ☐ ↓	NO BIRTHS 0-35 MONTHS BEFORE THE SURVEY ☐	→ 401
302	RECORD THE NAME OF THE MOST RECENT BIRTH FROM 213, LINE 01:	MOST RECENT BIRTH NAME _____	
303	Now I would like to ask you some questions about your last pregnancy that resulted in a live birth. While you were pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES . . . . . 1 NO 2	→ 308
304	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	**HEALTH PERSONNEL** DOCTOR . . . . . A NURSE/MIDWIFE . . . . . B AUXILIARY MIDWIFE . . . . . C COMMUNITY EXTENSION HEALTH WORKER . . . . . D **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT . . . . . E COMMUNITY HEALTH WORKER/ FIELD WORKER . . . . . F OTHER _____ X (SPECIFY)	
305	Where did you receive antenatal care for this pregnancy? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC, PRIVATE, OR NGO SECTOR, RECORD 'X' AND WRITE THE NAME OF THE PLACE(S).	**HOME** HER HOME . . . . . A OTHER HOME . . . . . B **PUBLIC SECTOR** GOVERNMENT HOSPITAL . . . . . C GOVERNMENT HEALTH CENTER . . . . . D GOVERNMENT HEALTH POST . . . . . E OTHER PUBLIC SECTOR _____ F (SPECIFY) **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL . . . . . G PRIVATE CLINIC . . . . . H OTHER PRIVATE MEDICAL SECTOR _____ I (SPECIFY) **NGO MEDICAL SECTOR** NGO HOSPITAL . . . . . J NGO CLINIC . . . . . K OTHER NGO MEDICAL SECTOR _____ L (SPECIFY) OTHER _____ X (SPECIFY)	

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	NAME OF CHILD _____	BIRTH HISTORY NUMBER	
306	How many weeks or months pregnant were you when you first received antenatal care for this pregnancy?	WEEKS . . . . . 1 MONTHS . . . . . 2 DON'T KNOW 998	
307	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES . . . . . DON'T KNOW 98	
308	During this pregnancy, did you take SP/Fansidar to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 401
309	How many times did you take SP/Fansidar during this pregnancy?	TIMES	
310	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	

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
401	CHECK 216, 217, AND 218 IN THE BIRTH HISTORY: ANY SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY? ONE OR MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ NO SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ → 501		
402	Now I would like to ask some questions about the health of your children born in the last 5 years. (We will talk about each separately, starting with the youngest.)		
403	RECORD THE NAME AND BIRTH HISTORY NUMBER FROM 213 OF THE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY, STARTING WITH THE LAST ONE. NAME OF CHILD _____ BIRTH HISTORY NUMBER . . . . . ☐☐		
404	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 416
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	
406	Were you told by a healthcare provider that (NAME) had malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
407	Did you seek advice or treatment for the illness from any source?	YES . . . . . 1 NO 2	→ 412

SECTION 4. FEVER IN CHILDREN

NO.	NAME OF CHILD _____	BIRTH HISTORY NUMBER	
408	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC, PRIVATE, OR NGO SECTOR, RECORD 'X' AND WRITE THE NAME OF THE PLACE(S).	**PUBLIC SECTOR** GOVERNMENT HOSPITAL ..... A GOVERNMENT HEALTH CENTER ..... B GOVERNMENT HEALTH POST ..... C MOBILE CLINIC ..... D COMMUNITY HEALTH WORKER/ FIELDWORKER ..... E OTHER PUBLIC SECTOR _____ (SPECIFY) F **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL ..... G PRIVATE CLINIC ..... H PHARMACY ..... I PRIVATE DOCTOR ..... J MOBILE CLINIC ..... K COMMUNITY HEALTH WORKER/ FIELDWORKER ..... L OTHER PRIVATE MEDICAL SECTOR _____ (SPECIFY) M **NGO MEDICAL SECTOR** NGO HOSPITAL ..... N NGO CLINIC ..... O OTHER NGO MEDICAL SECTOR _____ (SPECIFY) P **OTHER SOURCE** CHEMIST SHOP/PPMV ..... Q TRADITIONAL PRACTITIONER ..... R MARKET ..... S ITINERANT DRUG SELLER ..... T COMMUNITY-ORIENTED RESOURCE PERSON ..... U OTHER _____ (SPECIFY) X	
409	CHECK 408: TWO OR MORE CODES CIRCLED ☐ ↓	ONLY ONE CODE CIRCLED ☐ → 411	
410	Where did you first seek advice or treatment? USE LETTER CODE FROM 408.	FIRST PLACE ..... ☐	
411	How many days after the illness began did you first seek advice or treatment for (NAME)? IF THE SAME DAY RECORD '00'.	DAYS ..... ☐☐	
411A	While (NAME) was sick with this fever were you referred to go to a higher level of care?	YES ..... 1 NO 2	
412	At any time during the illness, did (NAME) take any medicine for the illness?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 → 416	

SECTION 4. FEVER IN CHILDREN

NO.	NAME OF CHILD _____	BIRTH HISTORY NUMBER	

413	What medicine did (NAME) take? Any other medicine? RECORD ALL MENTIONED. IF MEDICINE NOT KNOWN, ASK TO SEE THE PACKAGE OR PRESCRIPTION.	**ANTIMALARIAL MEDICINE** ARTEMISININ COMBINATION THERAPY (ACT) . . . . . A SP/FANSIDAR . . . . . B CHLOROQUINE . . . . . C AMODIAQUINE . . . . . D QUININE PILLS . . . . . E INJECTION/IV . . . . . F ARTESUNATE RECTAL . . . . . G INJECTION/IV . . . . . H OTHER ANTIMALARIAL _____ I (SPECIFY) **ANTIBIOTIC MEDICINE** AMOXICILLIN . . . . . J COTRIMOXAZOLE . . . . . K OTHER PILL/SYRUP . . . . . L OTHER INJECTION/IV . . . . . M **OTHER MEDICINE** ASPIRIN . . . . . N PARACETAMOL/PANADOL/ ACETAMINOPHEN . . . . . O IBUPROFEN . . . . . P OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
414	CHECK 413: ARTEMISININ COMBINATION THERAPY ('A') GIVEN CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ → 416		
415	How long after the fever started did (NAME) first take an 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	
415A	After (NAME) took an artemisinin combination therapy, did the fever go away?	YES . . . . . 1 NO 2	
416	CHECK 216 AND 217 IN BIRTH HISTORY: ANY MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY? NO MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ ↓ MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ → 403		

SECTION 5. MALARIA KNOWLEDGE AND BELIEFS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	In the past six months, have you seen or heard any messages about malaria?	YES . . . . . 1 NO 2	→ 503
502	Where did you see or hear these messages? PROBE: Anywhere else? RECORD ALL MENTIONED.	RADIO . . . . . A TELEVISION . . . . . B POSTER/BILLBOARD . . . . . C NEWSPAPER/MAGAZINE . . . . . D LEAFLET/BROCHURE . . . . . E HEALTHCARE PROVIDER . . . . . F COMMUNITY HEALTH WORKER . . . . . G SOCIAL MEDIA . . . . . H TOWN ANNOUNCER . . . . . I INTER-PERSONAL COMMUNICATION AGENT/ COMMUNITY VOLUNTEER . . . . . J FAMILY/FRIENDS . . . . . K OTHER _____ X (SPECIFY) DON'T REMEMBER . . . . . Z	
503	Are there ways to avoid getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 505
504	What are the things that people can do to prevent themselves from getting malaria? RECORD ALL MENTIONED.	SLEEP INSIDE A MOSQUITO NET . . . . . A SLEEP INSIDE AN INSECTICIDE-TREATED MOSQUITO NET . . . . . B USE MOSQUITO REPELLENT OR COIL . . . . C TAKE PREVENTATIVE MEDICATIONS . . . . D SPRAY HOUSE WITH INSECTICIDE . . . . . E FILL IN STAGNANT WATERS (PUDDLES) . . F KEEP SURROUNDINGS CLEAN . . . . . G PUT MOSQUITO SCREEN ON WINDOWS . . H OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
505	Now I am going to read some statements and I would like you to tell me whether you agree or disagree with each statement. If you don't know, say, don't know. People in this community only get malaria during the rainy season. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
506	When a child has a fever, you almost always worry it might be malaria. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
507	Getting malaria is not a problem because it can be easily treated. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	

SECTION 5. MALARIA KNOWLEDGE AND BELIEFS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
508	Only weak children can die from malaria. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
509	You can sleep inside a mosquito net for the entire night when there are lots of mosquitoes. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
510	You can sleep inside a mosquito net for the entire night when there are few mosquitoes Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
511	You do not like sleeping inside a mosquito net when the weather is too warm. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
512	When a child has a fever, it is best to start by giving them any medicine you have at home. Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
512A	It is important that children take the full dose of medicine that they are prescribed for malaria Do you agree or disagree?	AGREE . . . . . 1 DISAGREE . . . . . 2 DON'T KNOW/UNCERTAIN 8	
513	People in your community usually take their children to a health care provider on the same day or day after they develop a fever. Do you agree or disagree? IF RESPONDENT DOESN'T KNOW, PROBE: Would you say more than half or less than half of	AGREE/MORE THAN HALF . . . . . 1 DISAGREE/LESS THAN HALF . . . . . 2 DON'T KNOW/UNCERTAIN 8	
514	People in your community who have a mosquito net usually sleep inside a mosquito net every night. Do you agree or disagree? IF RESPONDENT DOESN'T KNOW, PROBE: Would you say more than half or less than half of the community does this?	AGREE/MORE THAN HALF . . . . . 1 DISAGREE/LESS THAN HALF . . . . . 2 DON'T KNOW/UNCERTAIN 8	
515	RECORD THE TIME.	HOURS . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

FORMATTING DATE: 30 Apr 2021
ENGLISH LANGUAGE: 23 July 2021

NIGERIA MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

NIGERIA
NATIONAL MALARIA ELIMINATION PROGRAMME
NATIONAL POPULATION COMMISSION

IDENTIFICATION

STATE _____

LOCAL GOV'T AREA _____

LOCALITY _____

ENUMERATION AREA _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . | | | | |

HOUSEHOLD NUMBER . . . . . | | | | |

LABORATORY SCIENTIST'S VISITS

	1	2	3	FINAL VISIT
DATE				DAY
LABORATORY SCIENTIST'S NAME				MONTH YEAR
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

NOTES:

TOTAL ELIGIBLE CHILDREN

LANGUAGE OF QUESTIONNAIRE** 0 1 LANGUAGE OF INTERVIEW** | | NATIVE LANGUAGE OF RESPONDENT** | | TRANSLATOR (YES = 1, NO = 2) |

LANGUAGE OF QUESTIONNAIRE** **ENGLISH**

**LANGUAGE CODES:
01 ENGLISH
02 HAUSA
03 YORUBA
04 IGBO
06 OTHER

TEAM NUMBER | |

TEAM SUPERVISOR
NAME _____
NUMBER | | | |

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101	CHECK CAPI OUTPUT FOR "LIST ELIGIBLE INDIVIDUALS/BIOMARKERS" COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN AGE 0-5 YEARS IN QUESTION 102 ON THIS PAGE AND SUBSEQUENT PAGES STARTING WITH THE FIRST ONE LISTED. IF MORE THAN THREE CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).		
	CHILD 1		SKIP
102	CHECK CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE.]	NAME _____ LINE NUMBER . . . . . ☐☐	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER . . . . . ☐☐	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. A few blood drops will be collected on a slide 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria and anemia tests?		
109	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	

110A	ASK CONSENT FOR DRIED BLOOD SPOTS COLLECTION FROM PARENT/RESPONSIBLE ADULT: As part of the survey, we are also asking to collect blood samples on filter paper to send to the lab to test to determine if the antimalaria medicines are still able to kill the parasite. For this test, a few drops of blood will be collected on a filter paper card to test at a laboratory for the ability of the antimalarial medicine to kill the malaria parasite. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after we take your blood. 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in collecting blood samples on filter paper?		
110B	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110C	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
110D	ASK CONSENT FOR ADDITIONAL TESTING FROM PARENT/RESPONSIBLE ADULT: We ask you to allow the ANDI Centre of Excellence for Malaria Diagnosis, College of Medicine, University of Lagos to store part of the blood sample at the laboratory for additional malaria tests or research. We are not certain about what additional malaria tests might be done. The blood sample will not have any name or other data attached that could identify you. You do not have to agree. If you do not want the blood sample stored for additional testing, you can still participate in testing to see if malaria medicines are still effective. Will you allow us to keep the blood sample stored for additional testing?		
110E	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110F	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 1		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH THE TESTS.		
112	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. PUT THE 2ND BAR CODE LABEL ON THE SLIDE, THE 3RD ON THE FILTER PAPER, THE 4TH ON THE SLIDE TRANSMITTAL FORM AND THE 5TH ON THE DBS TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . . . 99994 REFUSED . . . . . 99995 OTHER 99996	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . . 995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	→ 126 → 128 → 126
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine? i) Vomiting? j) Pallor? k) Refusal to eat? l) Very cold hands and feet?	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS . 1 2 c) LOSS OF CONSCIOUS 1 2 d) RAPID BREATHING . 1 2 e) SEIZURES . . . . . 1 2 f) BLEEDING . . . . . 1 2 g) JAUNDICE . . . . . 1 2 h) DARK URINE . . . . . 1 2 i)VOMITING . . . . . 1 2 j) PALLOR . . . . . 1 2 k) REFUSAL TO EAT . . . 1 2 l) VERY COLD HANDS AND FEET 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118
117	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 OTHER 6	→ 119
118	**SEVERE MALARIA REFERRAL** The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms suggestive of severe malaria. Due to the severity of your child's illness, the malaria treatment I have may 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking ACT given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES . . . . . 1 NO 2	→ 121
120	**ALREADY TAKING ACT REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received an 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 2 days after the last dose of ACT, you should take the child to the nearest health facility for further examination.		→ 128

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 1		SKIP
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICINE . . . . . 1 REFUSED MEDICINE . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. The second dose should be given 8 hours after the first dose on the day of commencement of treatment. TELL THE PARENT/RESPONSIBLE ADULT: 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 2 days, you should take him/her to a health professional for treatment right away.		→ 128
126	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129	IF ANOTHER CHILD, GO TO 102 ON THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.		

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 PARENTS TO TAKE CHILD TO HEALTH FACILITY.

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101	CHECK CAPI OUTPUT FOR "LIST ELIGIBLE INDIVIDUALS/BIOMARKERS" COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN AGE 0-5 YEARS IN QUESTION 102 ON THIS PAGE AND SUBSEQUENT PAGES STARTING WITH THE FIRST ONE LISTED. IF MORE THAN THREE CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).		
	CHILD 2		SKIP
102	CHECK CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE.]	NAME _____ LINE NUMBER	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . MONTH . . . . . YEAR	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. A few blood drops will be collected on a slide 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria and anemia tests?		
109	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) LAB SCIENTIST NUMBER	

110A	ASK CONSENT FOR DRIED BLOOD SPOTS COLLECTION FROM PARENT/RESPONSIBLE ADULT: As part of the survey, we are also asking to collect blood samples on filter paper to send to the lab to test to determine if the antimalaria medicines are still able to kill the parasite. For this test, a few drops of blood will be collected on a filter paper card to test at a laboratory for the ability of the antimalarial medicine to kill the malaria parasite. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after we take your blood. 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 or no. It is up to you to decide.		
110B	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110C	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
110D	ASK CONSENT FOR ADDITIONAL TESTING FROM PARENT/RESPONSIBLE ADULT: We ask you to allow the ANDI Centre of Excellence for Malaria Diagnosis, College of Medicine, University of Lagos to store part of the blood sample at the laboratory for additional malaria tests or research. We are not certain about what additional malaria tests might be done. The blood sample will not have any name or other data attached that could identify you. You do not have to agree. If you do not want the blood sample stored for additional testing, you can still participate in testing to see if malaria medicines are still effective. Will you allow us to keep the blood sample stored for additional testing?		
110E	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110F	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 2		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH THE TESTS.		
112	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. PUT THE 2ND BAR CODE LABEL ON THE SLIDE, THE 3RD ON THE FILTER PAPER, THE 4TH ON THE SLIDE TRANSMITTAL FORM AND THE 5TH ON THE DBS TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . . . 99994 REFUSED . . . . . 99995 OTHER 99996	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . . 995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	→ 126 → 128 → 126
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine? i) Vomiting? j) Pallor? k) Refusal to eat? l) Very cold hands and feet?	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS . 1 2 c) LOSS OF CONSCIOUS 1 2 d) RAPID BREATHING . 1 2 e) SEIZURES . . . . . 1 2 f) BLEEDING . . . . . 1 2 g) JAUNDICE . . . . . 1 2 h) DARK URINE . . . . . 1 2 i)VOMITING . . . . . 1 2 j) PALLOR . . . . . 1 2 k) REFUSAL TO EAT . . . 1 2 l) VERY COLD HANDS AND FEET 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118
117	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 OTHER 6	→ 119
118	**SEVERE MALARIA REFERRAL** The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms suggestive of severe malaria. Due to the severity of your child's illness, the malaria treatment I have may 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking ACT given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES . . . . . 1 NO 2	→ 121
120	**ALREADY TAKING ACT REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received an 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 2 days after the last dose of ACT, you should take the child to the nearest health facility for further examination.		→ 128

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 2		SKIP
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICINE . . . . . 1 REFUSED MEDICINE . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. The second dose should be given 8 hours after the first dose on the day of commencement of treatment. TELL THE PARENT/RESPONSIBLE ADULT: 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 2 days, you should take him/her to a health professional for treatment right away.		→ 128
126	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129	IF ANOTHER CHILD, GO TO 102 ON THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.		

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 PARENTS TO TAKE CHILD TO HEALTH FACILITY.

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101	CHECK CAPI OUTPUT FOR "LIST ELIGIBLE INDIVIDUALS/BIOMARKERS" COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN AGE 0-5 YEARS IN QUESTION 102 ON THIS PAGE AND SUBSEQUENT PAGES STARTING WITH THE FIRST ONE LISTED. IF MORE THAN THREE CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).		
	CHILD 3		SKIP
102	CHECK CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE.]	NAME _____ LINE NUMBER	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . MONTH . . . . . YEAR	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. A few blood drops will be collected on a slide 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria and anemia tests?		
109	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER	_____ (SIGN) LAB SCIENTIST NUMBER	

110A	ASK CONSENT FOR DRIED BLOOD SPOTS COLLECTION FROM PARENT/RESPONSIBLE ADULT: As part of the survey, we are also asking to collect blood samples on filter paper to send to the lab to test to determine if the antimalaria medicines are still able to kill the parasite. For this test, a few drops of blood will be collected on a filter paper card to test at a laboratory for the ability of the antimalarial medicine to kill the malaria parasite. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after we take your blood. 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 or no. It is up to you to decide.		
110B	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110C	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
110D	ASK CONSENT FOR ADDITIONAL TESTING FROM PARENT/RESPONSIBLE ADULT: We ask you to allow the ANDI Centre of Excellence for Malaria Diagnosis, College of Medicine, University of Lagos to store part of the blood sample at the laboratory for additional malaria tests or research. We are not certain about what additional malaria tests might be done. The blood sample will not have any name or other data attached that could identify you. You do not have to agree. If you do not want the blood sample stored for additional testing, you can still participate in testing to see if malaria medicines are still effective. Will you allow us to keep the blood sample stored for additional testing?		
110E	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110F	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 3		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH THE TESTS.		
112	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. PUT THE 2ND BAR CODE LABEL ON THE SLIDE, THE 3RD ON THE FILTER PAPER, THE 4TH ON THE SLIDE TRANSMITTAL FORM AND THE 5TH ON THE DBS TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . . . 99994 REFUSED . . . . . 99995 OTHER 99996	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . . 995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 → 126 NOT PRESENT . . . . . 4 → 128 REFUSED . . . . . 5 OTHER . . . . . 6 → 126	
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine? i) Vomiting? j) Pallor? k) Refusal to eat? l) Very cold hands and feet?	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS . 1 2 c) LOSS OF CONSCIOUS 1 2 d) RAPID BREATHING . 1 2 e) SEIZURES . . . . . 1 2 f) BLEEDING . . . . . 1 2 g) JAUNDICE . . . . . 1 2 h) DARK URINE . . . . . 1 2 i)VOMITING . . . . . 1 2 j) PALLOR . . . . . 1 2 k) REFUSAL TO EAT . . . 1 2 l) VERY COLD HANDS AND FEET 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118
117	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 → 119 OTHER 6	
118	**SEVERE MALARIA REFERRAL** The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms suggestive of severe malaria. Due to the severity of your child's illness, the malaria treatment I have may 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking ACT given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES . . . . . 1 NO . . . . . 2 → 121	
120	**ALREADY TAKING ACT REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received an 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 2 days after the last dose of ACT, you should take the child to the nearest health facility for further examination.		→ 128

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 3		SKIP
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICINE . . . . . 1 REFUSED MEDICINE . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER LABORATORY SCIENTIST NUMBER NUMBER.	_____ (SIGN) ☐☐☐☐ LAB SCIENTIST NUMBER	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. The second dose should be given 8 hours after the first dose on the day of commencement of treatment. TELL THE PARENT/RESPONSIBLE ADULT: 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 2 days, you should take him/her to a health professional for treatment right away.		→ 128
126	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . . . 1 8.0 G/DL OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129	IF ANOTHER CHILD, GO TO 102 IN ADDITIONAL QUESTIONNAIRE; IF NO MORE CHILDREN, END INTERVIEW.		

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 PARENTS TO TAKE CHILD TO HEALTH FACILITY.

LABORATORY SCIENTIST'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING BIOMARKERS

SUPERVISOR'S OBSERVATIONS

10 Oct 2019

NIGERIA MALARIA INDICATOR SURVEY
FIELDWORKER QUESTIONNAIRE

NIGERIA
NATIONAL MALARIA ELIMINATION PROGRAMME
NATIONAL POPULATION COMMISSION

LANGUAGE OF QUESTIONNAIRE ENGLISH

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
100	What is your name?	NAME _____	
101	RECORD FIELDWORKER NUMBER	NUMBER . . . . . [ ][ ][ ][ ]	

INSTRUCTIONS

Information on all MIS field workers is collected as part of the MIS survey. Please fill out the questions below. The information you provide will be part of the survey data file; however, your name will be removed and will not be part of the data file. Thank you for providing the information needed.

102	In what state do you live?	ABIA . . . . . 01 ADAMAWA . . . . . 02 AKWA IBOM . . . . . 03 ANAMBRA . . . . . 04 BAUCHI . . . . . 05 BAYELSA . . . . . 06 BENUE . . . . . 07 BORNO . . . . . 08 CROSS RIVER . . . . . 09 DELTA . . . . . 10 EBONYI . . . . . 11 EDO . . . . . 12 EKITI . . . . . 13 ENUGU . . . . . 14 FCT-ABUJA . . . . . 15 GOMBE . . . . . 16 IMO . . . . . 17 JIGAWA . . . . . 18 KADUNA . . . . . 19 KANO . . . . . 20 KATSINA . . . . . 21 KEBBI . . . . . 22 KOGI . . . . . 23 KWARA . . . . . 24 LAGOS . . . . . 25 NASARAWA . . . . . 26 NIGER . . . . . 27 OGUN . . . . . 28 ONDO . . . . . 29 OSUN . . . . . 30 OYO . . . . . 31 PLATEAU . . . . . 32 RIVERS . . . . . 33 SOKOTO . . . . . 34 TARABA . . . . . 35 YOBE . . . . . 36 ZAMFARA 37	
103	Do you live in a city, town, or rural area?	CITY . . . . . 1 TOWN . . . . . 2 RURAL 3	
104	How old are you? RECORD AGE IN COMPLETED YEARS.	AGE . . . . . [ ][ ]	
105	Are you male or female?	MALE . . . . . 1 FEMALE 2	
106	What is your current marital status?	CURRENTLY MARRIED . . . . . 1 LIVING WITH A MAN/WOMAN . . . . . 2 WIDOWED . . . . . 3 DIVORCED . . . . . 4 SEPARATED . . . . . 5 NEVER MARRIED OR LIVED WITH A MAN/WOMAN 6	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
107	How many living children do you have? INCLUDE ONLY CHILDREN WHO ARE YOUR BIOLOGICAL CHILDREN.	LIVING CHILDREN . . . . . [ ][ ]	
108	Have you ever had a child who died?	YES . . . . . 1 NO 2	
109	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY . . . . . 1 SECONDARY . . . . . 2 HIGHER 3	
110	What is the highest class/form/year you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	CLASS/FORM/YEAR . . . . . [ ][ ]	
111	What is your religion?	CATHOLIC . . . . . 01 OTHER CHRISTIAN . . . . . 02 ISLAM . . . . . 03 TRADITIONALIST . . . . . 04 NO RELIGION . . . . . 95 OTHER _____ 96 (SPECIFY)	
112	What is your ethnicity?	ETHNICITY _____ [ ][ ]	
113	What languages can you speak?	ENGLISH . . . . . A HAUSA . . . . . B YORUBA . . . . . C IGBO . . . . . D URHOBO . . . . . E IBIBIO . . . . . F EDO . . . . . G FULFULDE . . . . . H KANURI . . . . . I OTHER _____ X (SPECIFY)	
114	What is your mother tongue/native language (language spoken at home growing up)?	ENGLISH . . . . . A HAUSA . . . . . B YORUBA . . . . . C IGBO . . . . . D URHOBO . . . . . E IBIBIO . . . . . F EDO . . . . . G FULFULDE . . . . . H KANURI . . . . . I OTHER _____ 96 (SPECIFY)	
115	Have you ever worked on: a) a DHS prior to this survey? b) an MIS prior to this survey? c) any other survey prior to this survey?	YES NO a) DHS . . . . . 1 2 b) MIS . . . . . 1 2 c) OTHER SURVE 1 2	
116	Were you already working for the National Malaria Elimination Programme (NMEP) or the National Population Commission (NPC) at the time you were employed to work on this MIS?	YES, NMEP . . . . . 1 YES, NPC . . . . . 2 NO 3	→ 118
117	Are you a permanent or temporary employee of NMEP or NPC?	PERMANENT . . . . . 1 TEMPORARY 2	
118	If you have comments, please write them here.		

ADDITIONAL DHS PROGRAM RESOURCES

The DHS Program Website – Download free DHS reports, standard documentation, key indicator data, and training tools, and view announcements.	DHSprogram.com	
STATcompiler – Build custom tables, graphs, and maps with data from 90 countries and thousands of indicators.	Statcompiler.com	
DHS Program Mobile App – Access key DHS indicators for 90 countries on your mobile device (Apple, Android, or Windows).	Search DHS Program in your iTunes or Google Play store	
DHS Program User Forum – Post questions about DHS data and search our archive of FAQs.	userforum.DHSprogram.com	
Tutorial Videos – Watch interviews with experts and learn DHS basics, such as sampling and weighting, downloading datasets, and How to Read DHS Tables.	www.youtube.com/DHSProgram	
Datasets – Download DHS datasets for analysis.	DHSprogram.com/Data	
Spatial Data Repository – Download geographically linked health and demographic data for mapping in a geographic information system (GIS).	spatialdata.DHSprogram.com	
Learning Hub – Access online courses for independent learning and workshop participation, communities of practice, and other training resources.	Learning.DHSprogram.com	
GitHub – Open access to Stata, SPSS and R code for DHS indicators for public use.	Github.com/DHSprogram	
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