

MALARIA CONSORTIUM

PROTOCOL FOR SEASONAL MALARIA CHEMOPREVENTION END-OF-ROUND COVERAGE SURVEY

2023

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**List of Contributors**

# ABBREVIATIONS AND ACRONYMS

|  |  |
| --- | --- |
| AQ | Amodiaquine  |
| CAPI | Computer-assisted Personal Interviews  |
| CDD | Community Drug Distributors |
| CI | Confidence Interval  |
| DOT | Directly Observed Treatment  |
| EA | Enumeration Area |
| ESS | Effective Sample Size  |
| GPS | Geographical Positioning System |
| HF | Health Facility  |
| ICC | Intra-cluster Correlation  |
| LGA | Local Government Area |
| LLIN  | Long-lasting Insecticide Nets |
| M&E  | Monitoring and Evaluation  |
| NHREC | National Health Research Ethics Committee |
| NMEP | National Malaria Elimination Programme |
| NMIS | National Malaria Indicator Survey  |
| NMSP | National Malaria Strategic Plan |
| NPHC | National Population and Housing Census |
| NPopC | National Population Commission  |
| PPS | Probability Proportional to Size |
| RBM | Roll Back Malaria  |
| RDT | Rapid Diagnostic Test |
| SMC | Seasonal Malaria Chemoprevention |
| SP | Sulfadoxine-pyrimethamine  |
| WHO | World Health Organization |

# BACKGROUND

Malaria remains a disease of public health importance globally. In 2020, an estimated 241 million cases of malaria occurred worldwide with Nigeria contributing 23% to the global malaria burden and 31.9% malaria death. (WHO, 2020). By the end of 2021, 29 countries accounted for 96% of malaria cases, with a substantial disease burden in sub-Saharan Africa and Nigeria bearing more than one-fourth (27%) of the global malaria cases (WHO, 2021). Children under 5 years remain the most vulnerable group affected by malaria. According to the 2020 World Malaria Report (WHO, 2020) children under five years accounted for 80% of all malaria deaths in Africa in 2020. Although the burden of malaria has decreased in recent years, an increase was observed in 2020; largely attributed to the disruptions to services during the COVID-19 pandemic, upsetting the health gains made in the global malaria control (WHO, 2021). Preventive treatment strategies are key elements of the multipronged strategy to reduce disease burden and transmission. This intervention suppresses existing infections and prevents the consequences of parasitemia, including disease and death.[[1]](#footnote-1) Seasonal malaria chemoprevention (SMC) is recommended only in areas of highly seasonal transmission with the aim to control and eliminate Malaria. SMC is distributed through mass drug administration (MDA), with the goal of treating at-risk populations at appropriate regular intervals. Seasonal malaria chemoprevention (SMC) is the intermittent administration of a curative dose of antimalarial medicine during the malaria season. The objective of SMC is to establish antimalarial drug concentrations in the blood that clear existing infections and prevent new ones during the period of greatest malaria risk. The medicine of choice is a combination of sulfadoxine pyrimethamine (SP) and amodiaquine (AQ) and monthly cycles of SP+AQ have been widely used for SMC in African children under 5 years old and have been shown to be efficacious, safe, well tolerated, available and inexpensive.

Nigeria adopted the WHO policy recommendation on SMC in 2014 following the conduct of pilot studies in seven local government areas (LGAs) in three of the States in the Sahel area; Jigawa, Kano, and Katsina States. Thus, in 2015, implementation of SMC took place in 6 LGAs in Jigawa and Katsina, which expanded to 52 LGAs in Sokoto, Zamfara, Jigawa and Borno in 2016.

From the microplanning for 2023 SMC implementation, about 19,232,221 children aged 3 – 59 months are eligible for SMC in the 13 Malaria Consortium states as part of the states identified through a recent malaria risk stratification mapping that was conducted by the National Malaria Elimination (NMEP) with support from WHO. The risk stratification was part of the review of the 2014 - 2020 National Malaria Strategic Plan (NMSP) which ~~identified~~ the need to expand the geographical scope of the SMC implementation scale to include States in the non-Sahel region that are emerging with similar rainfall pattern, thus similar malaria transmission intensity. These additional states have been proposed in the current ~~next~~ NMSP 2021 – 2025 to also implement SMC with the support of the NMEP and its Roll Back Malaria (RBM) partners. Of these 21 states, Malaria Consortium supports 13 with funding support from the Global Fund (GF), MC/Philanthropic Funding (PF) and Korea International Cooperation Agency (KOICA). These include Jigawa, Kaduna, Kano and Niger (GF), Bauchi (18 LGAs), Borno, FCT, Kebbi, Kogi, Nasarawa, Oyo, Plateau and Sokoto (PF) and (2 LGAs of) Bauchi (KOICA).

Typically, a full SMC course is administered over four monthly cycles from July to October, coinciding with the rainy season. However, an analysis of rainfall patterns in Nigeria suggest that the malaria transmission season is longer and starting as early as June in some states in the North central (Plateau, Kogi, Nasarawa, FCT, and Bauchi) and Southwest zones of Nigeria, leading to a rise in cases prior to the first cycle.

The eligible states for SMC in 2023 and their funders/implementers are listed on Table 1 below.

**Table 1: Microplanning Figures for 2023 SMC Implementation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/No** | **State** | **Microplan under-5 population- for 2023 SMC** | **Children 3-11 monthsTarget Population** | **Children 12-59 monthsTarget Population** | **Total Target Population**  | **Partners/ Donor** |
| 1 | Jigawa | 1,473,289 | 265,551 | 1,134,801 | 1,400,352 | **MC/ GF** |
| 2 | Kaduna | 1999690 | 359,944 | 1,539,761 | 1,899,706 |
| 3 | Kano | 3,218,528 | 579,335 | 2,478,266 | 3,057,601 |
| 4 | Niger | 1447238 | 260,043 | 1,113,899 | 1,373,942 |
| 5 | Bauchi | 2,193,621 | 394,852 | 1,689,088 | 2,083,940 | **MC-PF** |
| 6 | Kebbi | 1,444,760 | 260,057 | 1,112,465 | 1,372,522 |
| 7 | Sokoto | 1,440,621 | 259,312 | 1,109,278 | 1,368,590 |
| 8 | Plateau | 1,053,325 | 189,599 | 811,061 | 1,000,659 |
| 9 | Kogi | 1,241,972 | 223,555 | 956,318 | 1,179,873 |
| 10 | Nasarawa | 977,950 | 176,031 | 753,021 | 929,052 |
| 11 | Borno | 2,467,184 | 444,093 | 1,899,732 | 2,343,825 |
| 12 | FCT | 963,151 | 173,367 | 741,626 | 914,993 |
| 13 | Oyo | 323,333 | 58,200 | 248,966 | 307,166 |

**2023 Protocol for SMC Coverage Survey**

A fundamental step for monitoring the success of SMC is to know the coverage of the SPAQ distributions – that is, **how many eligible children between 3-59 months in need of treatment swallowed the drugs.** Without reliable information about SMC coverage, programme managers and their staff cannot monitor programme performance effectively. Routine monitoring of SMC coverage is essential to track progress towards programme goals and to identify communities with poor or insufficient coverage in order to permit timely and appropriate actions to improve coverage.

Monitoring of SMC coverage is typically based on routinely reported coverage rates, which are calculated by aggregating community drug distributors’ (CDD) records and dividing by the estimated population requiring SMC, according to census figures or CDD’s reports. While reported coverage is an essential tool for programme monitoring, it is prone to errors resulting from incorrect estimates of the target population, weak health information systems, underreporting, and intentional inflation of the number of those treated. Typically, a full SMC course is administered over four monthly cycles from July to October, coinciding with the rainy season. However, an analysis of rainfall patterns in Nigeria suggest that the malaria transmission season is longer and starting as early as June in some states in the North central (Plateau, Kogi, Nasarawa, FCT, and 10 LGAs in Bauchi) and Southwest zones of Nigeria, leading to a rise in cases prior to the first cycle.

Coverage evaluation surveys are a valuable tool for evaluating programme performance. Coverage evaluations are population-based surveys designed to provide precise estimates of SMC coverage while overcoming many of the biases and errors that can undermine reported coverage.

The purpose of this protocol is to present a straightforward population-based survey method designed to provide accurate estimates of SMC coverage after the implementation of the fourth/fifth cycle and measure key performance indicators over the entire round for the 2023 SMC implementation.



**Figure 2: States eligible for Seasonal Malaria Chemoprevention in Nigeria**

# END-OF-ROUND COVERAGE SURVEY OBJECTIVES

Typically, SMC coverage survey is seen as a tool for **estimating SMC coverage**, other objectives of SMC coverage surveys include:

## Primary objectives

The primary objectives of the survey are to:

* **Validate reported coverage rates** – coverage survey results will be used to check the accuracy of the data recording and reporting system and take corrective actions where necessary.
* **Identify reasons for rejections/refusal** –by identifying common reasons for not swallowing the drugs, implementers will improve social mobilization prior to the next MDA round.
* **Detect problems with the supply chain and distribution systems** – coverage surveys can identify groups of individuals for whom the drugs were never offered, and corrective action will be taken.
* **Measure coverage in specific populations** –survey tools will be used to measure SMC coverage levels in subpopulations (e.g., age, sex, rural vs. urban areas).
* **Provide an opportunity for measuring other population attributes** –investigating additional issues (e.g., knowledge attitudes and practices towards the SMC; the prevalence of morbidity, performance of CDDs) can generate valuable information for improving programme performance.
* Determine the level of adherence to SPAQ administration regimen by caregivers of targeted children on days two and three of the fourth/fifth cycle of SMC.
* Ascertain the level of adherence to the SMC protocol by the CDDs during cycles 1 to 4/5.
* To assess the effectiveness of the use of technology by Community Drug Distributors (CDDs) in Seasonal Malaria Chemoprevention (SMC) implementation

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## Secondary objectives

The secondary objectives are to:

1. Identify the most accessed information channel on SMC by caregivers of targeted children.
2. Assess the adequacy of information given to mothers/ caregivers of targeted children on what to do in the event of an adverse reaction to SMC medicine.
3. Ascertain the proportion of ineligible children ages 5-10 years that were administered SPAQ during the SMC.
4. Explore the ideational factors such as perceptions and attitudes that are related to SMC such as caregivers’ belief that SPAQ prevents malaria, and perceived self-efficacy to administer SMC.

# KEY SMC END-OF-ROUND SURVEY VARIABLES

The survey questionnaire will provide information on the following key variables:

* **SMC survey coverage**: Proportion of eligible children treated with SMC among the total eligible children sampled for the survey for each of the cycles.
* **SMC over age treatment**: Proportion of ineligible children ages 5-10 years that were administered SPAQ during SMC
* **Blister retention**: Proportion of households with blister retained among eligible households.
* **Children treated with SP+AQ on Day 1 of cycle and supervised (DOT):** Proportion of treated eligible children for whom delivery was supervised among total treated eligible children.
* **Card retention**: Proportion of households where child card is retained among all eligible households sampled.
* **Home doses ticked on card (**0, 1, 2, and 3, including day 1 dose): Proportion of households where at least one SMC dose is ticked on card among households where card is retained.
* **SMC coverage by doses** (0, 1, 2, and 3, including day 1 dose): Proportion of eligible children covered by the 3 doses of SP+AQ (by number of doses) among total eligible children sampled.
* **Cohort tracking by cycles** [Cycle 1, 2, 3,4 and 5 (where applicable)]: Percentage coverage of eligible children who received full course of SMC for at least 3 cycles and all the 4 or 5 cycles among eligible children sampled.
* **Coverage of children aged 5–10 years**: Children over 5 years covered among children over 5 years sampled.
* **SMC refusal rate:** Proportion of households refusing SMC among eligible households visited by community drug distributors.
* **SMC awareness:** Number of caregivers reporting awareness of SMC among eligible households visited by community drug distributors.
* **Knowledge about SMC purpose**: Proportion of caregivers responding correctly to question on purpose of SMC among eligible households visited by community distributor.
* **Knowledge about number of SMC doses to be given** Proportion of caregivers responding correctly to question on number of recommended SMC doses among eligible households visited by community drug distributors.
* **Knowledge about age eligibility for SMC**: Proportion of caregivers responding correctly to questions related to age eligibility among eligible households visited by community distributor.
* **Knowledge about timing of SMC administration**: Proportion of caregivers responding correctly to questions related to days SMC doses are given among eligible households visited by community distributor.
* **Knowledge of SMC adverse event:** Proportion of caregivers who can identify SMC-related adverse event among eligible households visited by community drug distributor.
* **Knowledge of SMC adverse event:** Proportion of caregivers who know what to do in case of SMC-related adverse event among eligible households visited by community drug distributor.
* **Awareness of SMC:** Proportion of caregivers who heard announcements about SMC through mass media within the last month among household with eligible children sampled.
* **Awareness of SMC:** Proportion of caregivers who heard announcements about SMC through town announcers within the last month among household with eligible children sampled.
* **Awareness of SMC:** Proportion of caregivers who heard announcements about SMC through community leaders within the last month among household with eligible children sampled.
* **Awareness of SMC:** Proportion of caregivers who heard announcements about SMC through health worker within the last month among household with eligible children sampled.
* **Confidence to give second and third SMC doses:** Proportion of caregivers reporting self-confidence in giving second and third SMC doses among eligible households visited by community drug distributor.
* **Confidence to identify adverse events:** Proportion of caregivers reporting self-confidence in identifying adverse events among eligible households visited by community drug distributor.
* **Adverse drug reaction**: Percentage of fever reported by caregivers of eligible children with ADR among households visited by CDD.
* **Adverse drug reaction by type**: Percentage of yellow eyes reported by caregivers of eligible children with ADR among households visited by CDD.
* **Adverse drug reaction by type:** Percentage of diarrhea reported by caregivers of eligible children with ADR among households visited by CDD.
* **Adverse drug reaction by type**: Percentage of vomiting reported by caregivers of eligible children with ADR among households visited by CDD.
* **Adverse drug reaction by type**: Percentage of severe skin rash reported by caregivers of eligible children with ADR among households visited by CDD.
* **Confidence to take child to health center in the occurrence of adverse events:** Proportion of caregivers reporting self-confidence to take child to health center in case of adverse events among eligible households visited by community drug distributor.
* **Perception on SMC:** Proportion of caregivers reporting positive perception of SMC among eligible households visited by community drug distributors.
* **Use of personal protective equipment by distributors**: Proportion of caregivers reporting that distributor wore mask among eligible households visited by community drug distributor.
* **Delivery of COVID-19 prevention messages**: Proportion of caregivers who reported to have received information on COVID-19 prevention during SP+AQ administration among eligible households visited by community drug distributors.
* **Household possession of mosquito net**: Percentage of household with at least one mosquito net (treated or untreated) among households visited by CDD.
* **Use of mosquito net by persons in the household**: Percentage of persons who slept under an LLIN last night among household visited by CDD.
* **Adherence to SMC delivery protocol**: Percentage of household correctly marked by CDD among households visited by CDD.
* **Adherence to SMC delivery protocol**: Percentage of CDDs known to caregivers among household visited by CDD.
* **Adherence to SMC delivery protocol**: Percentage of HH visited by lead mother to remind caregiver to administer AQ on day2 and 3.
* **SMC impact assessment**: Percentage of Children treated with SMC per cycle, who had fever within the last month (caregiver-reported) among households visited by CDD.
* **SMC impact assessment**: Percentage of Children treated with SMC, who had fever was taken to the HF (caregiver-reported) among households visited by CDD.
* **SMC impact assessment**: Percentage of Children treated with SMC, who had fever and tested positive for malaria by RDT/Microscopy (caregiver-reported) among households visited by CDD.
* **Use of technology in SMC implementation**: Percentage of CDDs using mobile devices for SPAQ data recording
* **Use of technology in SMC implementation**: Percentage of eligible children with unique identity numbers for SPAQ administration

Other information to be obtained will include the following:

* Household refused distributor to speak to householder due to COVID-19
* Household member reported COVID-19 symptoms within the last month prior to survey.
* Covid-19 vaccination received by members of household (1st and 2nd dose)
* Community distributor known to caregiver.
* Reason child did not receive SP (Day 1)
* Reason child did not receive AQ on Day 2 and 3
* Reasons for non-availability of SMC card
* Sources of information about SMC
* Measures of socioeconomic position of household (occupation, assets and amenities, level of education of head of household and caregiver)
* Re-dosing on Day 1 in the case of vomiting
* Receipt of SMC outside house-to-house SMC distribution (e.g., opportunistically from health facility personnel, a fixed point
* Questions on recent places of residence and migration

# METHODS

## Survey design

A cross-sectional survey will be conducted in each of the states implementing SMC to collect data and measure coverage of the SMC treatment programme among eligible children aged 3-59 months in the state.

## Survey Area

The End of Round coverage survey will be conducted in Bauchi, Kebbi, Sokoto, Jigawa, Kogi, Plateau, Borno, and Nasarawa States.

**Jigawa State** is Situated in central northern Nigeria with an estimated under-five population of over 1,473,289. Jigawa State covers 23,154 square kilometers and lies between Latitudes 11.00oN to 13.00oN and Longitudes 8.00oE to 10.15oE. Jigawa State shares a common border with Kano and Katsina States to the west, Bauchi State to the southeast, Yobe State to the and Republic of Niger to the north. Most parts of the State lie within the Sudan Savannah with elements of Guinea Savannah in the southern part. The total number of LGAs in the state is 27.

**Bauchi State** is Located in the North-Eastern part of the Nigeria with an estimated under-five population of 2,193,621, Bauchi State covers 45,837 square kilometers. Bauchi State is bounded by Kano and Jigawa to the north, Yobe and Gombe to the east and Kaduna State to the west and Plateau and Taraba State to the south. The latitude for Bauchi, Nigeria is: 10.300964 and the longitude is: 9.823653. Bauchi state is one of the states in the Northern part of Nigeria that span two distinctive vegetation zones, namely, the Sudan Savannah and the Sahel Savannah. Two main rivers transverse the state, the Gongola and Hadejia rivers. The total number of LGAs in the state is 20.

**Kebbi State** is located on the northwestern part of Nigeria with an estimated under-five population of 1,444,760. The State lies between latitudes 10¬0 and 130N and longitudes 3030’ and 60E. It has a total landmass of about 37,699 square kilometers out of which 36.46% is made up of farmland. has a latitude of 12°25'54.33"N and a longitude of 4°11'44.24"E or 12.431759 and 4.195621 respectively. However, about one third of the state is situated in desert prone environment thus making it one of the front-line states for the menace of drought and desertification. The state shares an extensive border with Niger Republic to the North and Benin Republic to the west with many inter-cultural and ethnic linkages. It is internally bordered to the North-East by Sokoto State to the East by Zamfara State and to the south by Niger State. The total number of LGAs in the state is 21.

**Sokoto** **state**, northwestern [Nigeria](https://www.britannica.com/place/Nigeria), bordering the [Republic of Niger](https://www.britannica.com/place/Niger) to the north with an estimated under-five population of 1,440,621. The State shares boundaries with [Kebbi](https://www.britannica.com/place/Kebbi-state-Nigeria) state to the west and south, and Zamfara to the south and east. Sokoto state occupies an area of short-grass savanna vegetation in the south and [thorn scrub](https://www.britannica.com/science/thorn-forest) in the north. It has a total land mass of 25,900 square kilometers (km2) of Land Area. The latitude of Sokoto, Nigeria is 13.005873, and the longitude is 5.247552. .Sokoto State is in the dry [Sahel](https://en.wikipedia.org/wiki/Sahel), surrounded by sandy [savannah](https://en.wikipedia.org/wiki/Savannah) and isolated hills. With an annual average temperature of 28.3 °C (82.9 °F), Sokoto is, on the whole, a very hot area. However, maximum daytime temperatures are for most of the year generally under 40 °C (104.0 °F) and the dryness makes the heat bearable. The warmest months are February to April when daytime temperatures can exceed 45 °C (113.0 °F). The rainy season is from June to October during which showers are a daily occurrence. The showers rarely last long and are a far cry from the regular torrential rain known in wet tropical regions. From late October to February, during the cold season, the climate is dominated by the [Harmattan](https://en.wikipedia.org/wiki/Harmattan) wind blowing [Sahara](https://en.wikipedia.org/wiki/Sahara) dust over the land. The total number of LGAs in the state is 23.

**Nasarawa** State is a [state](https://en.wikipedia.org/wiki/States_of_Nigeria) in the [North Central](https://en.wikipedia.org/wiki/North_Central_Nigeria)region of [Nigeria](https://en.wikipedia.org/wiki/Nigeria) with an estimated under-five population of 977,950. The State is bordered to the east by the states of [Taraba](https://en.wikipedia.org/wiki/Taraba_State) and [Plateau](https://en.wikipedia.org/wiki/Plateau_State), to the north by [Kaduna State](https://en.wikipedia.org/wiki/Kaduna_State), to the south by the states of [Kogi](https://en.wikipedia.org/wiki/Kogi_State) and [Benue](https://en.wikipedia.org/wiki/Benue_State), and to the west by the [Federal Capital Territory](https://en.wikipedia.org/wiki/Federal_Capital_Territory_%28Nigeria%29). Nasarawa has a latitude of 8°32'50.89"N and a longitude of 7°42'42.48"E or 8.547469 and 7.7118 respectively. Geographically, the state is mostly within the [tropical](https://en.wikipedia.org/wiki/Tropical_and_subtropical_grasslands%2C_savannas%2C_and_shrublands) [Guinean forest–savanna mosaic](https://en.wikipedia.org/wiki/Guinean_forest%E2%80%93savanna_mosaic) [ecoregion](https://en.wikipedia.org/wiki/List_of_ecoregions_in_Nigeria). Important geographic features include the [River Benue](https://en.wikipedia.org/wiki/River_Benue) forming much of Nasarawa State's southern borders and the state's far northeast containing a small part of the [Jos Plateau](https://en.wikipedia.org/wiki/Jos_Plateau). The total number of LGAs in the state is 13.

**Kogi State** is a [state](https://en.wikipedia.org/wiki/States_of_Nigeria) in the [North Central](https://en.wikipedia.org/wiki/North_Central_Nigeria) region of [Nigeria](https://en.wikipedia.org/wiki/Nigeria) with an estimated under-five population of 1,241,972. The State is bordered to the east by the states of [Ekiti](https://en.wikipedia.org/wiki/Ekiti_State) and [Kwara](https://en.wikipedia.org/wiki/Kwara_State), to the north by the [Federal Capital Territory](https://en.wikipedia.org/wiki/Federal_Capital_Territory%2C_Nigeria), to the northeast by [Nasarawa State](https://en.wikipedia.org/wiki/Nasarawa_State), to the northwest by [Niger State](https://en.wikipedia.org/wiki/Niger_State), to the southwest by the states of [Edo](https://en.wikipedia.org/wiki/Edo_State) and [Ondo](https://en.wikipedia.org/wiki/Ondo_State), to the southeast by the states of [Anambra](https://en.wikipedia.org/wiki/Anambra_State) and [Enugu](https://en.wikipedia.org/wiki/Enugu_State), and to the west by [Benue State](https://en.wikipedia.org/wiki/Benue_State) as being the only state in Nigeria to border ten other states. The latitude and longitude of Lokoja are 7.79688000 and 6.74048000 respectively. The State covers a total land mass of 29,833 km2 Geographically, the state is within the [tropical](https://en.wikipedia.org/wiki/Tropical_and_subtropical_grasslands%2C_savannas%2C_and_shrublands) [Guinean forest–savanna mosaic](https://en.wikipedia.org/wiki/Guinean_forest%E2%80%93savanna_mosaic) [ecoregion](https://en.wikipedia.org/wiki/List_of_ecoregions_in_Nigeria). Important geographic features include the key rivers with the [Niger](https://en.wikipedia.org/wiki/Niger_River) flowing from the northwest and the [Benue](https://en.wikipedia.org/wiki/Benue_River) coming from the northeast before the two rivers meet in Kogi's centre and bisect the state southward. The total number of LGAs in the state is 21.

**Plateau State** is located in North Central Nigeria with an estimated under-five population of over 1,053,325. The State occupies 30,913 square kilometers. Plateau State shares borders with Kaduna State to the North, Kaduna and Nasarawa States to the East, Benue to the South and Taraba State to the East. The altitude ranges from around 1,200 meters (about 4000 feet) to a peak of 1,829 meters above sea level in the Shere Hills range near Jos. Plateau State is located between latitude 80°24'N and longitude 80°32' and 100°38' east. Plateau State has led to a reduced incidence of some tropical diseases such as malaria. The Jos Plateau makes it the source of many rivers in northern Nigeria including the Kaduna, Gongola, Hadejia and Yobe rivers. The total number of LGAs in the state is 17.

**Oyo State** is located in Southwest Nigeria with an estimated under-five population of 300,692 in SMC targeted LGAs. Oyo State covers 323,333 square kilometers. It is bounded in the south by Ogun State and in the north by Kwara State, in the west by the Republic of Benin while in the east it is bounded by Osun State. The latitude of Oyo is 7.842958, and the longitude is 3.936844. The state is homogenous and comprises the Oyos, the Ibadans and the Ibarapas, all belonging to the Yoruba family and speaking the same Yoruba language. People from within and outside the country trade and settle in the state, mostly in the urban areas. The capital, Ibadan is reputed to be the largest city in Africa, south of the Sahara. Oyo State has an equatorial climate with dry and wet seasons and relatively high humidity. The dry season lasts from November to March while the wet season starts in April and ends in October. Average daily temperature ranges between 25 °C (77.0 °F) and 35 °C (95.0 °F), almost throughout the year. The total number of LGAs in the state is 33.

**Borno State** is a [state](https://en.wikipedia.org/wiki/States_of_Nigeria) in the [North-East geopolitical zone](https://en.wikipedia.org/wiki/North_East_%28Nigeria%29) of [Nigeria](https://en.wikipedia.org/wiki/Nigeria) with an estimated under-five population of 2,467,184. The State is bordered by [Yobe](https://en.wikipedia.org/wiki/Yobe_State) to the west, [Gombe](https://en.wikipedia.org/wiki/Gombe_State) to the southwest, and [Adamawa](https://en.wikipedia.org/wiki/Adamawa_State) to the south while its eastern border forms part of the national [border with](https://en.wikipedia.org/wiki/Cameroon-Nigeria_border) [Cameroon](https://en.wikipedia.org/wiki/Cameroon), its northern border forms part of the national [border with](https://en.wikipedia.org/wiki/Niger%E2%80%93Nigeria_border) [Niger](https://en.wikipedia.org/wiki/Niger), and its northeastern border forms all of the national [border with](https://en.wikipedia.org/wiki/Chad%E2%80%93Nigeria_border) [Chad](https://en.wikipedia.org/wiki/Chad), being the only Nigerian state to border three foreign countries. Borno state is located between latitude 10 N and 14 N and longitude 11 30 E and 14 45 E. The State which has an area of 61, 435sq km. Geographically, the state is divided between the [semi-desert](https://en.wikipedia.org/wiki/Semi-desert) [Sahelian savanna](https://en.wikipedia.org/wiki/Sahelian_savanna) in the north and the [West Sudanian savanna](https://en.wikipedia.org/wiki/West_Sudanian_savanna) in the centre and south with a part of the montane [Mandara Plateau](https://en.wikipedia.org/wiki/Mandara_Plateau_mosaic) in the southeast. In the far northeast of the state is the Nigerian portion of [Lake Chad](https://en.wikipedia.org/wiki/Lake_Chad) and the [Lake Chad flooded savanna](https://en.wikipedia.org/wiki/Lake_Chad_flooded_savanna) [ecoregion](https://en.wikipedia.org/wiki/List_of_ecoregions_in_Nigeria); Total number of LGAs in the state is 27.

The **Federal Capital Territory**, commonly known as FCT, is a [federal territory](https://en.wikipedia.org/wiki/Federal_territory) in central [Nigeria](https://en.wikipedia.org/wiki/Nigeria) with an estimated under-five population of 963,151. [Abuja](https://en.wikipedia.org/wiki/Abuja), the [capital city](https://en.wikipedia.org/wiki/Capital_city) of Nigeria, is located in this territory. FCT was formed in 1976[[4]](https://en.wikipedia.org/wiki/Federal_Capital_Territory_%28Nigeria%29#cite_note-4) from parts of the states of old [Kwara](https://en.wikipedia.org/wiki/Kwara_State), [Niger](https://en.wikipedia.org/wiki/Niger_State), [Kaduna](https://en.wikipedia.org/wiki/Kaduna_State) and [Plateau](https://en.wikipedia.org/wiki/Plateau_State) States with the bulk of landmass carved out of Niger State. It is within the [North Central](https://en.wikipedia.org/wiki/North_Central_Nigeria)region of the country. The territory is located just north of the confluence of the [Niger River](https://en.wikipedia.org/wiki/Niger_River) and [Benue River](https://en.wikipedia.org/wiki/Benue_River). It is bordered by the states of Niger to the West and North, [Kaduna](https://en.wikipedia.org/wiki/Kaduna_State) to the northeast, [Nasarawa](https://en.wikipedia.org/wiki/Nasarawa_State) to the east and south and [Kogi](https://en.wikipedia.org/wiki/Kogi_State) to the southwest. Lying between latitude 8.25 and 9.20 north of the equator and longitude 6.45 and 7.39 east of Greenwich Meridian, Abuja is geographically located in the center of the country. The Federal Capital Territory has a landmass of approximately 7,315 km2, and it is situated within the [savannah](https://en.wikipedia.org/wiki/Savannah) region with moderate climatic conditions. The total number of LGAs in the state is 6.

**Kano state** is located in the North-Western part of Nigeria and is the second-largest state by population. The state’s economy has solidified its place in the country's top five, particularly in manufacturing and trading .[[2]](#footnote-2) Kano is the commercial and investment hub of Northern Nigeria and thelargest non-oil and gas economy in Nigeria, with a GDP of approximately US$12 billion. The Kano economy is driven largely by commerce, manufacturing and subsistence agriculture – the dominant activity, with up to 70% of the population engaged directly or indirectly[[3]](#footnote-3). Additionally, education and health care are also major sources of income for the state. The state’s urban centres also serve as hubs for tourism and culture. Over 50% of its population live in rural areas.

The State had a population of more than 14.3 million people as of 2019 and 15,462,177 in 2022. It is one of the most populous states in Nigeria. About 20% of households are in the lowest wealth quintile, and literacy level is 44% (NMIS 2021). The State's population growth rate is estimated to be 2.05% according to the 2019 Population Census. Kano State has an arid climate, meaning there is very low annual rainfall, with most of it falling in the months of June, July, and August. The average amount of annual precipitation is: 886 mm (34.9 inches).[[4]](#footnote-4) Additionally, the state is prone to severe droughts and floods. Kano falls into 2 eco zones; Northern Guinea Savannah and the Sudan Savannah.[[5]](#footnote-5)

**Jigawa State** is one of the 36 states of Nigeria, located in the North-western region of Nigeria. Due to state's semi-arid climate, outward migration by workers to neighbouring states such as Kano State in search of off-season work is common. Scarcity of arable land within the state has become increasingly problematic in recent years, with arable farmland increasingly vulnerable to national disasters like flooding, which will become more prevalent due to climate change. The state is the 10th largest non-oil and gas economy in Nigeria, with an estimated Gross Domestic Product (GDP) of nearly N800 billion. Agriculture remains the dominant economic activity contributing the bulk of GDP and engaging more than 80% of the population both directly and indirectly. Jigawa has a predominantly informal domestic trade sector, consisting of thousands of subsistence enterprises. In addition to the hundreds of regular markets spread across towns and villages, Jigawa has a number of specialized markets - at Sara, Gujungu, Maigatari, Kupsa and Hadejia, dealing in large scale agricultural commodities and livestock merchandising, with Maigatari being one of the largest livestock markets in West Africa. The Federal Office of Statistics, in 2001, classified Jigawa State among those with relatively high severity and incidence of poverty in the country, with a Gross Per Capita Income of N35, 000 per annum (US$290), which is below the National Average, and till date Jigawa State is being rated among the poorest states in Nigeria. The State had a population of about 7.5 million in 2022. About 37% of households are in the lowest wealth quintile, and literacy level is 41% (NMIS 2021).

**Kaduna State** is located in North-West Nigeria and has a population of 9,032,181 people. It is the fourth largest state in the country and is bordered by Kebbi, Zamfara, Katsina, and Jigawa states. Additionally, Kaduna Refining and Petrochemical Company (KRPC), one of Nigeria's four main oil refineries is located in Kaduna. It is supplied by a pipeline from the Niger Delta oil fields.

A 2009 World Bank survey states that Kaduna is one of the top six cities with the highest unemployment rate, which stood at 20%. About 7% of households are in the lowest wealth quintile, and literacy level is 63% (NMIS 2021). Kaduna experiences extreme seasonal variation in monthly rainfall. The rainy period of the year lasts for 7.4 months, from March 25 to November 6, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Kaduna is August, with an average rainfall of 11.8 inches. The state has distinct wet and dry seasons and is within the Northern Guinea Savannah zone and part of the Sudan Savannah zone of Nigeria with daily temperatures ranging from 14.6-36 °C and a relative humidity of 12-72% (KDSG, 2008).

**Niger state** has the largest landmass with about 70% arable and cultivable land.  It is nicknamed “Power State” as being home to three (3) hydroelectric dams that generate about 70% combined power output in the Nation’s Power Sector. It has an international boundary with the Republic of Benin along Agwara and Borgu LGAs to the Northwest, thereby promoting trade relations.

The state has suffered from activities of bandits and kidnappers and the increasing spate of attacks by bandits not only stokes unease in many rural communities it also denies people access to schools, health care facilities, farms, and other sources of legitimate livelihood. About 21% of households are in the lowest wealth quintile, and literacy level is 24% (NMIS 2021). Niger State experiences distinct dry and wet seasons with annual rainfall varying from 1,100mm in the northern part to 1,600mm in the southern parts. The rainy season lasts for between 150 and 120 days in the southern and northern parts of the state respectively.

***Enumeration Areas***

An Enumeration Area (EA) is the smallest geographical statistical unit created for a housing and population census.[[6]](#footnote-6) For example, an EA can be a city block, a village or part of a village, or a group of small villages. The EA should have well-defined boundaries identified on a map. The number of households per EA is generally small enough to be covered by one enumerator during the census. The size of the EAs is fairly uniform, although there is some variability in the number of households by EA. In some countries, the average size of EAs is different for urban and rural areas.

***Location Map***

 A location map is a map produced during the household listing operation that shows the location of the cluster along with its boundaries. It also includes instructions on how to get to the cluster and any information that can be used to find the cluster and its boundaries.

**Steps in** h**ousehold Mapping and Listing Activities**

The household listing operation involves three main steps: locating each cluster, preparing the location and sketch maps of each cluster, and listing all households found in each cluster.

##

## Step 1: Locating the Cluster

The supervisor will provide the listing team with a base map containing the cluster assigned to the team. Upon arrival in a cluster, the team should first tour the cluster to identify its boundaries and create the location map of the cluster (described below). This should be done with the assistance of the local authorities where the cluster is located. During this first tour of the cluster, the listing team should determine an efficient route of travel for listing all structures in the cluster.

In most cases, the cluster boundaries are recognizable natural features such as streams or rivers or features such as roads or railroads. However, in some cases such as in rural areas where the cluster boundaries may not be marked with visible features, particular attention should be paid to the information provided on the base map. In such cases, assistance from local authorities will be particularly helpful.

Following the identification of the cluster boundaries, the listing team will tour the cluster a second time to create the listing and draw the sketch map of the cluster. A sketch map is a detailed map of the cluster showing all its structures and features such as roads.

## Step 2: Preparing Location and Sketch Maps

The mapping of the cluster and the listing of the households should be done in a systematic manner so that there are no omissions or duplications. The cluster should be divided into parts if possible, and a part can be a block of structures. The team should finish each block before going to the adjacent one. Within each block, start at one corner of the block and move clockwise around the block. In rural areas where structures are found in small groups, the team should work in one group at a time. In each group, start from the centre and move clockwise around it.

**Location mapping**

During the first tour of the cluster, using the Cluster Information Form, the mapper will:

1. First enter the identification information of the cluster on page 1. This information is provided by the supervisor.
2. Using page 1, the mapper will then prepare a location map of the cluster. This involves drawing a map that shows the location of the cluster along with its boundaries and the boundaries of the parts that comprise the cluster. This location map should include all instructions on how to get to the cluster and any information that can be used to find the cluster and its boundaries.

**Sketch mapping**

During the second tour of the cluster, using page 2 of the Cluster Information Form, the mapper will draw a sketch map of all structures found in the cluster as follows:

1. Marking the starting point with a large ‘X’, identify on the map each structure by a small square at the spot where it is located in the cluster. Non-residential structures should be identified by their use (e.g., school, shop, or factory).
2. Number all structures in sequential order beginning with “1”. Whenever there is a break in the numbering of structures (e.g., when moving from one block to another), use an arrow to indicate how the numbers proceed from one set of structures to another. Although it may be difficult to pinpoint the exact location of the structure on the map, even an approximate location is useful for finding the structure in the future.
3. Add to the sketch map landmarks, public buildings (e.g., park, school, or temple) and streets or roads. Sometimes it is useful to add to the sketch map landmarks that are found outside the cluster boundaries, if they are helpful in identifying other structures inside the cluster.
4. With permission, use the marker to write on the door or frame of the entrance to the structure the number that has been assigned to the structure on the sketch map. Note that this is the serial number of the structure that will be assigned on the household listing form. In order to distinguish the SMC coverage survey number from other numbers that may exist already on the door/frame of the structure, write SMC in front of the structure number, for example SMC/60 for structure number 60.
5. Ensure that all of the structures within the cluster boundaries are covered.

The listing team should be careful to locate hidden structures. In some areas, structures have been built so haphazardly that they can easily be missed. If there is a pathway leading from the listed structure, check to see if the pathway goes to another structure. People living in the area may help in identifying any hidden structures.

**Step 3: Listing of Households**

Using the Household Listing Form, the Lister will record all structures and households found in the cluster as follows:

1. Begin by entering the identification information of the cluster.
2. Leave blank the first two columns which are reserved for office use.
3. **Column (1)** [Serial Number of Structure]: Record for each structure the same structure serial number that the mapper enters on the sketch map.
4. **Column (2)** [Address/description of structure]: Provide the street address of the structure or any description of the structure that helps to locate it.
5. **Column (3)** [Residence (Yes/No)]: Indicate whether the structure is used for residential purposes (eating and sleeping) by circling Y for “Yes”. In cases where a structure is used for commercial or other purposes, circle N for “No”. Structures used for both residential and commercial purposes (for example a combination of store and home), should be classified as residential (i.e., circle Y in column 3). Make sure to list any dwelling unit found in a non-residential structure (for example, a guard living inside a factory or in a church).

All structures must be listed, including vacant structures and structures under construction, as well as structures where the household members refuse to co-operate, or are not at home at the time of listing.

1. **Column (4)** [Serial Number of Household in the structure]: This is the serial number assigned to each household found in the structure. There can be more than one household in a structure. The first household in the structure will always have the number “01”. If there is a second household in the structure, then this household should be recorded on the next line, and “02” is recorded in column 4. If the structure is an apartment building, assign one serial number to the entire structure (only one square with one number appears on the sketch map), but complete columns 4 through 7 for each apartment in the building individually.
2. **Column (5)** [Name of the Head of Household]: Write the name of the head of the household. There can only be one head per household.
3. **Column (6)** [Households with children under 5]: Indicate whether the household includes children under age 5. Note that this column is optional and is used when households with children under 5 are to be oversampled such as in countries with low fertility rates. The column should be deleted if not applicable.
4. **Column (7)** [Status of dwelling]: Circle “1” if occupied. If a dwelling is unoccupied, observations or information from neighbors will advise the appropriate code to circle. Under special circumstances where an unoccupied dwelling cannot be classified as vacant “2” or with the household temporarily absent “3”, “Other” should be circled and accompanied by the specifics of the situation in column (8).
5. **Column (8)** [Observations]: Record any special information about the household or structure (e.g., non-residential structure, under construction, or household refusal).

**Household Selection**

The household selection will be done at the central office once all the listing forms are completed for all clusters. To obtain the sample of households to be interviewed for the MICS survey, the following steps are required.

**Step 1**: In column “HH number”, starting with “1”, assign sequentially a number to all households listed in the Cluster meeting one of the three following criteria:

* Occupied residential dwellings.
* Households that refused to cooperate during household listing.
* Households whose occupants were temporarily absent during household listing.

Leave the cell blank if the dwelling unit is not occupied (Column 7 = 2) or the structure is not a residential structure. For each cluster, the number assigned to the last household listed that meets one the above 3 criteria correspond to the total number of households for that cluster.

**Step 2**: After sequentially numbering of all households listed in each cluster, record the total number of households in the customized Excel spreadsheet used for household selection (SMC coverage survey Household Selection Template). For each cluster, record also the percentage that the selected segment represents in the EA that was segmented in the column “Proportion of the selected segment”. The percentage to record is in the selected segment row of the “Percent of total” column on the Segmentation Form of the EA. If no segmentation was carried out, leave the value of “1” in the column (Proportion of the selected segment).

**Step 3**: The Excel spreadsheet used for household selection will automatically generate the household numbers for households to be interviewed in the survey. The selected households should be indicated on the Household Listing Form by circling the corresponding number in the HH Number column. The selected sub-sample of households should be indicated in the first column (HH selected for men) of the Household Listing Form by an X or a tick. The column can be deleted if not applicable.

**S*ample size estimation***

Using the formula for calculating sample size for a discrete outcome (Lwanga et al, 1991) to estimate an expected coverage of 80% among eligible children, with the desired precision of ±5%, and a standard deviation of 1.96 at the 95% confidence level, a minimum effective sample size (ESS) of 245.862 eligible children is obtained per state.

For the assessment, the selected enumeration area constitutes a cluster.

To adjust for design effect due to clustering (Kish, 1965), assuming an intra-cluster correlation (ICC) of 0.2 and an average cluster size (n) of 20 eligible children (WHO, 2018):

Design/cluster effect is given as = 1 + (n-1) \* ICC

 = 1 + (20-1) \* 0.2 = 4.8

Multiplying the Design Effect by the ESS:

245.862 \*4.8 = 1180.1376

To adjust for non-response, assuming a 95% response rate:

1180.1376/0.95 = 1242.250 = 1242 approximately

For ease of sampling, in each state, a total of 1320 matched pairs of caregivers and children aged 3-59 months will be selected from 20 households (assuming one eligible pair per household) in 66 clusters. (See details in Table 1).

## Sampling frame and sampling design

The sampling frame proposed for the coverage assessment is the Population and Housing Census of the Federal Republic of Nigeria ~~(NPHC)~~, which was conducted in 2006 by the National Population Commission (NPopC). Administratively, Nigeria is divided into states. Each state is subdivided into LGAs, and each LGA is divided into wards. In addition to these administrative units, during the 2006 NPHC, each locality was subdivided into convenient areas called census enumeration areas (EAs). These EAs are referred to as clusters for the SMC coverage assessment and are defined based on EAs from the 2006 EA census frame. The assessment management team will work with the NPopC to obtain a list of EAs and an estimated number of households in each EA for the respective assessment states.

A modified cluster sampling design will be employed to select 1320 caregiver-child pairs in each SMC campaign state (Table 1). In 2 LGAs from each 3 senatorial zone in SMC implementing states, at the first stage, 66 clusters will be randomly selected in each state by Probability Proportional to Size (PPS). The cluster size refers to the total number of households within an EA. Selected clusters which are security compromised will be replaced by randomly selected back-up clusters. Information about security situations in assessment areas will be requested from the appropriate authorities prior to selection. At the second stage, 20 eligible households will be selected from each selected cluster using a simple random sampling method. This stage will be preceded by a household listing of all eligible households, to generate a household sampling frame. There will be two sets of respondents for the assessment with different questionnaires: primary caregivers of children under the age of five and heads of households. In the absence of the head of household, the primary caregiver will respond to the head of household’s questions as much as possible. A primary caregiver in this assessment refers to any individual, aged 15 years or over, with the primary responsibility for the feeding and daily care of at least one child under the age of five, in a household where he or she has been resident prior to the start of the SMC programme or one month before the last cycle of the treatment. We defined a household head as a member of the family who manages the resources and is the final decision maker in the household.

**Table 1: Example of Sampling Scheme for SMC Coverage Survey in Kano State**

|  |  |
| --- | --- |
| **Sampling stages** | **Kano** |
| **No. of LGAs implementing SMC** | 44 |
| **Clusters selected (A)** | 66 |
| **Households selected per cluster (B)** | 20 |
| **Sample size** **(@ 1/household) (A\*B)** | **990** |

# DATA COLLECTION

## Survey Tools

A structured survey questionnaire will be administered to the caregiver and head of household using the handheld electronic data collection devices, via a digital online data collection app. This approach will minimize errors in data collection and entry. It will also help in collecting Geographical Positioning System (GPS) information which will serve as part of the quality assurance and provide spatial data for geo-referencing of findings. The questionnaire is designed to be administered to households as the epidemiological unit. The questionnaire is composed of questions related to the selected household and eligible child’s demographics; quality of SMC administration; fidelity to the SMC protocol by CDDs; knowledge, attitude and perceptions related to SMC as well as knowledge of COVID-19 (including prevention) among caregivers; practice of CDDs in relation to COVID-19 infection control measures. Another set of questions will be asked from the caregiver of a randomly selected child whose age is between 5 and 10 years to measure the proportion of children within the age range who received SMC.

The questionnaires will be administered to caregivers of eligible children by independent research assistants trained in the use of the tool. The data tools will be pretested and piloted in non- survey clusters within the state. This will be done to determine:

* Reaction of the respondents to the research procedure
* Acceptability of the questions asked.
* Willingness of the respondents to answer and participate in the survey.
* Validity and reliability of the questionnaire
* Time needed to administer the questionnaire.
* The feasibility of the sampling procedure
* Adequacy of data collectors per visit for the assessment
* Knowledge and competencies of data collectors
* Effectiveness of training

## DATA COLLECTION PROCEDURES

The data collection process and fieldwork will last for a period of about seven days in each state. Two data collectors and one supervisor would constitute a team. The supervisor has the responsibility to ensure that data collected is uploaded to the server daily. Questions will be asked exactly the way they were written in the translated language, and in situations requiring interpretation, enumerators would ensure that the meaning of the questions is not altered. An average of 15 households will be covered per team per day.

Field data collection at the households will be carried out using forms which are electronically configured on the android devices. On arrival in a selected household, the enumerator will identify the head of the household, explain the purpose of the survey, ascertain the presence of at least one child eligible for SMC, and take permission to continue to the next step. The enumerator will then make a list of all children less than 10 years old in the household, including their ages, gender and day 1 SMC administration in cycle 4 OR 5 as applicable. Using this list, an eligible child, and another child older than 59 months (if available) will be randomly selected. The enumerator will proceed to interview the eligible child’s parent or primary caregiver after getting informed consent. After completing this interview, the consenting primary caregiver of the selected child above 59 months will also be interviewed to determine if the ineligible child (aged 5–10 years) was given SMC (Day 1). Finally, the head of household will be interviewed for questions related to the household. A unique cluster and household identifier will be automatically generated by the electronic device used for data collection. Each of the selected children will also be given unique identifiers. The dataset obtained will not contain information from which respondents can be identified (e.g., their name) to ensure confidentiality.

Fieldwork for data collection will be followed by daily review meetings among data collectors and supervisors to review completed tools, complete quality checks, validate entries and agree on strategies where necessary to facilitate quality data collection including reconciliation of facility names, community name, and descriptions. Data uploads should be made to a central cloud-based database daily to be reviewed by the central quality assurance team.

## MANAGEMENT OF FIELDWORK

There will be a detailed preparation for fieldwork which will include recruitment and training of field personnel (data collectors and supervisors), data collection, data management and analysis, autonomy and confidentiality of data collection, and data security. Adequate technical support will be given by the Research Coordinator, M&E team, and Data Analyst. The data collectors will report to the supervisors. All challenges encountered at household, community and LGA levels will be documented as lessons learned to guide future implementation. Prior to the main data collection, a pretest of tools will be conducted followed with a briefing session to share experiences, lessons learned from the field and plan for the main data collection. The engaged vendor ensures the monitoring of the data collector, integrity of data capture will be reviewed through 5% checkback per sample clusters and data quality issues will be resolved as appropriate.

## DATA MANAGEMENT

Data collection will be done by computer-assisted personal interviews (CAPI) through online data collection platforms, using electronic android devices. This allows for in-field data entry and server synchronization. Data collected will be verified for quality assurance purposes by the supervisors in-field and uploaded daily to the online platform. The uploaded files will undergo additional consistency checks, cleaned, and saved as appropriate data files e.g., Stata format data files. Extensive data cleaning will be done at the end of the fieldwork prior to and during analysis.

## DATA ANALYSIS

Data analysis will be carried out using statistical software e.g., Stata, SPSS etc. All indicators of interest will be presented in proportions by state and an average across all the states using probability weights. A confidence interval (CI) of 95% will be estimated for each proportion to provide a range of values around the estimate within which it will be expected to fall in the target population. A data analysis plan will be developed by the engaged vendor and shared with Malaria Consortium for consensus.

# ETHICAL CONSIDERATIONS

 Ethical approval should be obtained for the survey from the National Health Research Ethics Committee (NHREC) to ensure the survey is in accordance with the ethical research standards applied in the Federal Republic of Nigeria. Informed consent will be sought from all respondents by means of a consent form developed in English and translated into the relevant local languages. Respondents should be informed of the nature of the survey, benefits and risks involved, what will be required of them as survey participants, and given an indication of the time that would be required to complete the survey. All personal or biographic data collected as part of this survey will be electronically stored securely within the implementing partner’s central office, de-identified and only available to authorized individuals for analytical purposes to enhance confidentiality. All survey instruments and protocols need to be approved before the survey.

# *Safety considerations for surveys during Covid-19 pandemic*

Since the first reported COVID-19 case in Wuhan, China on 31st December 2019, the world has been grappling with both the public health and economic ramifications of the COVID-19 pandemic. In the early days of the pandemic, many research activities were halted from fear of COVID-19 infection propagation. However, as research remains ethically relevant even during public health emergencies, research activities have gradually resumed under specified regulations. Therefore, the coverage survey will be carried out according to the existing National Guidelines on COVID-19 during all stages of research activities—training/workshops, meetings, data collection – including consent taking and interviews. The general guiding principles will be to protect all study participants and survey personnel from infection, including training facilitators, data collectors, and supervisors as well as the community members in survey locations. Measures to be taken during survey activities will include social distancing (limiting physical interactions to two meters apart), appropriate use of face masks, frequent hand hygiene, and disinfection of equipment. An operational guidance for implementing SMC in the COVID-19 context developed by the RBM Partnership is available in [Annex 3](#_Annex_3).

# *Schedule for coverage survey*

The SMC coverage survey is programmatically required to be conducted within 2-4 weeks of the conclusion of the fourth cycle of SMC. The interval between the last day of cycle 4/5 implementation and commencement of the survey should not be longer than 4 weeks in extreme circumstances to avoid recall bias among survey respondents. A tentative schedule for the 2023 end-of-round coverage survey in the nine states that implemented SMC is shown in [Annex 1](#_Annex_1:_Schedule).

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7. World Health Organization (2020). World Malaria Report 2020. Geneva: Global Malaria Programme, World Health Organization.
8. World Health Organization (WHO, 2022). Guidelines for Malaria. WHO Geneva 3 June 2022, pp90 - 95

# Annex 1: Schedule of the 2023 SMC coverage survey in the states

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **State** | **Last Cycle (4 or 5) Implementation Date** | **Tentative Timeline for Coverage Survey** |
| 1 | Bauchi | October 2023 | November – December 2023 |
| 2 | Borno | October 2023 | November – December 2023 |
| 3 | FCT | October 2023 | November – December 2023 |
| 4 | Jigawa | October 2023 | November – December 2023 |
| 5 | Kaduna | October 2023 | November – December 2023 |
| 6 | Kano | October 2023 | November – December 2023 |
| 7 | Kebbi | October 2023 | November – December 2023 |
| 8 | Kogi | October 2023 | November – December 2023 |
| 9 | Nasarawa | October 2023 | November – December 2023 |
| 10 | Niger | October 2023 | November – December 2023 |
| 11 | Oyo | October 2023 | November – December 2023 |
| 12 | Plateau | October 2023 | November – December 2023 |
| 13 | Sokoto | October 2023 | November – December 2023 |

# Annex 2 : 2023 SMC Coverage Survey Questionnaire



# Annex 3: SMC & COVID-19 Operational Guidance



1. WHO 2016 -2030 Global Technical Strategy for Malaria [↑](#footnote-ref-1)
2. Brief History of Kano state

 https://www.nigeriagalleria.com/Nigeria/States\_Nigeria/Kano/Brief-History-of-Kano.html [↑](#footnote-ref-2)
3. Kano State Official website https://kanostate.gov.ng/economy#:~:text=The%20Kano%20economy%20is%20driven,population%20engaged%20directly%20or%20indirectly. [↑](#footnote-ref-3)
4. Average monthly snow and rainfall

 in Kano https://weather-and-climate.com/average-monthly-precipitation-Rainfall,Kano,Nigeria [↑](#footnote-ref-4)
5. An Assessment of Crop Farmer Households’ Perceptions of Climate Change and

Coping Strategies in Kano State, NigeriaAvailable online at http://www.ajol.info/index.php/njbas/index

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6. UNICEF 2013; Manual for mapping and household listing - UNICEF MICS. https://mics.unicef.org › files [↑](#footnote-ref-6)