



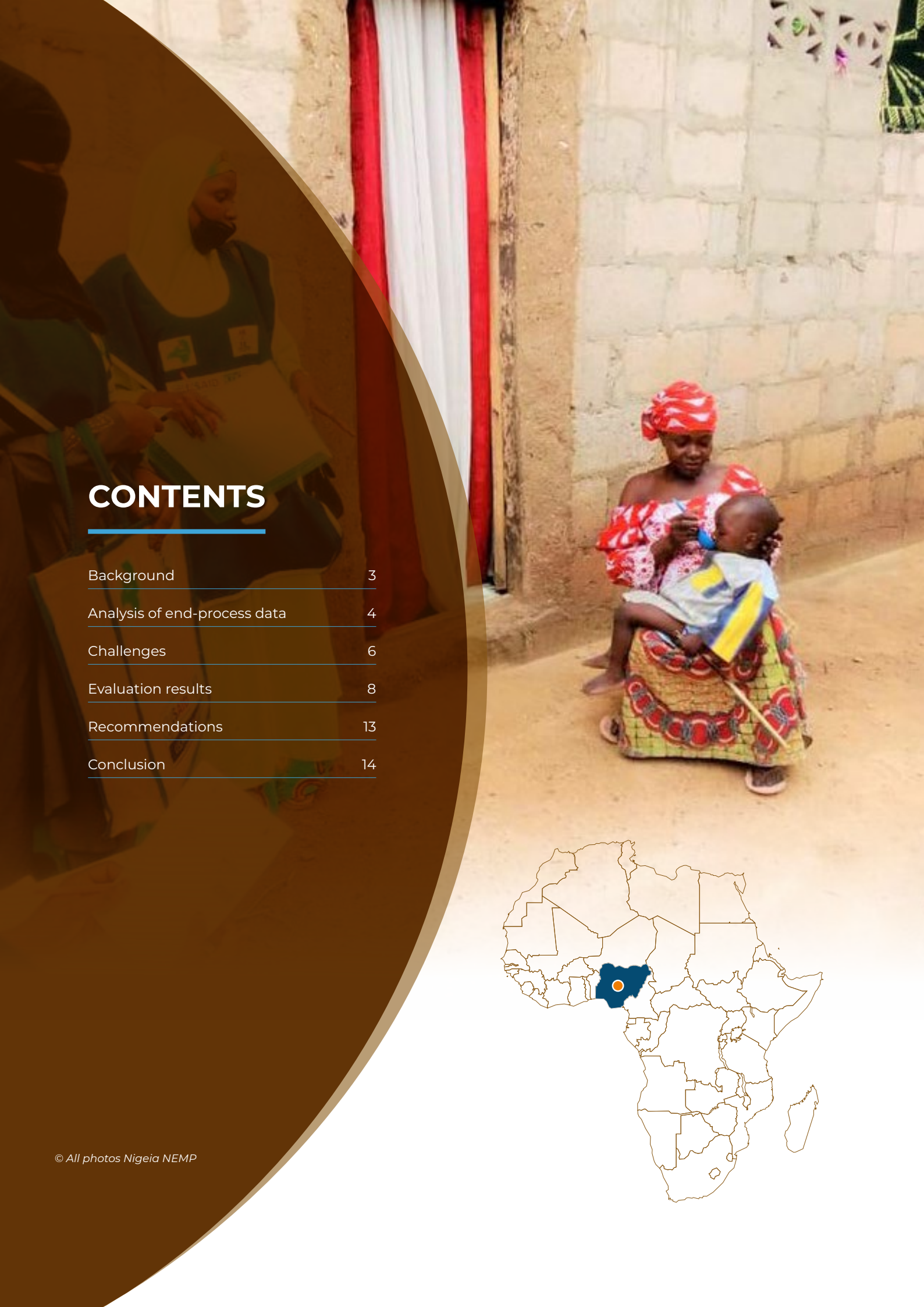
## **NIGERIA CASE STUDY:**

# MODIFIED POST ITN CAMPAIGN COVERAGE AND USE ASSESSMENT STRATEGY

OCTOBER 2022

# CONTENTS

Background	3
Analysis of end-process data	4
Challenges	6
Evaluation results	8
Recommendations	13
Conclusion	14



## BACKGROUND

Malaria is endemic throughout Nigeria, with an estimated 97 per cent of the population at risk of the disease. Malaria transmission occurs all year round making it a major cause of morbidity and mortality in the country. Significant efforts have been made to reduce the prevalence and impact of the disease and progress to date is largely due to scaling up of proven interventions, prominent among which is the use of insecticide treated nets (ITNs) as the main intervention for malaria vector control, complementing other preventive, diagnostic and treatment interventions.

Since the commencement of ITN mass campaigns in 2009 in Nigeria, post-distribution evaluation (termed end-process monitoring) using widespread household sampling has been implemented in most states according to specific protocols and using standardized tools to generate data about the ITN distribution, including immediate post-distribution hanging and use. The overall objective of the end-process monitoring has been to inform programmatic directions to improve campaign outcomes in future states.

In Nigeria, ITN campaigns are usually conducted in two phases: door-to-door registration of households followed by fixed site ITN distribution. In 2020, however, in the Global Fund-supported states, campaigns were switched to a single-phase, door-to-door strategy (combined registration and distribution without net cards [vouchers]) due to the COVID-19 pandemic. States supported by the US President's Malaria Initiative (PMI), retained the two-phase campaign strategy.



# ANALYSIS OF END-PROCESS DATA

---

In 2021, the Alliance for Malaria Prevention (AMP) with funding from<sup>1</sup> US Centers for Disease Control and Prevention (CDC) analysed the existing end-process data for 17 state campaigns that were implemented between 2017 and 2020.

The analysis by AMP provided an opportunity to assess whether campaign outcomes were affected by adaptations and modifications to strategies and activities to minimize the risk of COVID-19 transmission. The analysis included three types of data:

- Administrative ITN campaign data by local government area (LGA) from 14 state campaigns between 2017—2019
- Lot quality assurance sampling (LQAS) summary data by LGA from 13 state campaigns between 2017—2020
- LQAS data by household for four LGAs in Taraba and Kaduna states (2019 campaigns)

Following the analysis, it was observed that there were some weaknesses in the sampling protocol and missed opportunities for the National Malaria Elimination Programme (NMEP) to get pertinent management data to be used for decision-making. The weaknesses identified included:

- There were no national standard probability rules for selecting wards, settlements and households
- The sampling process was not based on accepted statistical methodologies, and the reliability of statistical conclusions was poor
- Household-level data were not used along with the administrative and supervision data to evaluate ITN campaigns
- There was a lack of semi-qualitative open-ended “why” questions for a selected sub-sample of households that did not meet certain criteria to provide additional information on the data collected during the LQAS visit
- The lack of established best-practice survey/LQAS analysis using a data analysis digital application (Stata, SPSS, R, etc.) that has commands for complex survey analysis, including appropriate weighting, to calculate point estimates and confidence intervals at LGA, state and national levels

Based on the observations, the NMEP requested AMP to provide technical support to modify the end-process strategy for the country. The modified strategy was piloted for the Jigawa ITN mass campaign in 2021.

---

<sup>1</sup> Funding allocated to the International Federation of Red Cross and Red Crescent Societies (IFRC) which houses and chairs AMP at its headquarters in Geneva.

**Table 1:** Comparison between the old and new strategy for end-process evaluation

Original strategy	Modified strategy
<p>Originally, the end-process monitoring protocol used in the country describes sample selection as:</p> <ul style="list-style-type: none"> <li>● Four surveyors (campaign implementation team) were engaged per LGA.</li> <li>● Four wards in each LGA were selected.</li> <li>● Four settlements in each of the four wards were selected.</li> <li>● Ten households were to be interviewed in each selected settlement.</li> <li>● In total, 160 selected households in each LGA were included in the LQAS framework.</li> </ul>	<p>The major revisions made to the end process sampling protocol were as follows:</p> <ul style="list-style-type: none"> <li>● Four surveyors were also engaged per LGA.</li> <li>● Eight clusters were selected in each LGA (an LGA is called a lot).</li> <li>● Between 6–10 primary sampling units (PSUs)/ clusters per lot were selected. It was agreed that more than 10 PSUs/clusters per LGA might make the workload unmanageable. For the Jigawa end process monitoring, eight PSUs were selected per lot.</li> <li>● In total, 80 selected households in each lot (LGA) were included in the LQAS framework.</li> </ul>
<ul style="list-style-type: none"> <li>● There were no fixed rules for selection of wards, settlements and households.</li> <li>● The selection of wards and settlements was based on convenience sampling which can lead to bias.</li> <li>● An entire settlement, mostly containing more than 25 households, was considered as a PSU.</li> <li>● Neither the NMEP nor its implementing partners described or systematically recorded the methods used for the selection of wards, settlements and households. Therefore, probability sampling at each stage was not assured.</li> </ul>	<ul style="list-style-type: none"> <li>● Establishment of national standard probability sampling rules for selecting wards, settlements and households.</li> <li>● Wards and settlements were selected using probability proportional to estimated size (PPES) methods.</li> <li>● Establishment of a two-stage method for selecting wards and then households.</li> <li>● Establishment of a standard method for selecting ten households per PSU/cluster.</li> </ul>
<ul style="list-style-type: none"> <li>● LQAS analysis was not done using any data analysis application.</li> <li>● States aggregated household data into summary data by LGA using paper forms.</li> <li>● The reliability of statistical conclusions was poor.</li> </ul>	<ul style="list-style-type: none"> <li>● Conducting LQAS analysis using a data analysis application (Stata, SPSS, R, etc) that has commands for complex survey analysis, including appropriate weighting, to calculate point estimates and confidence intervals at LGA, state, and national levels. For Jigawa, Stata was used for the data analysis.</li> </ul>
<ul style="list-style-type: none"> <li>● Further probing was not conducted for households that did not meet certain criteria in the questionnaire.</li> </ul>	<ul style="list-style-type: none"> <li>● Three “why” questions were added to the questionnaire for a selected sub-sample of households that did not meet certain criteria.</li> </ul>
<ul style="list-style-type: none"> <li>● Questions assessing source of information combined the questions on media channels that are budgeted and not budgeted (e.g. radio was budgeted for in the campaign budget, but the questionnaire combines it with television, SMS, etc. which were not budgeted for).</li> </ul>	<ul style="list-style-type: none"> <li>● Questions assessing the source of information were expanded to include radio separate from other media channels because it is budgeted separately in the social and behaviour change (SBC) budget for the campaigns.</li> </ul>

# CHALLENGES

The major challenges encountered in deploying the modified end-process strategy in Jigawa were across the following key areas:



**Training:** The orientation of the technical team was rushed and inadequate to allow participants to fully understand the modified process. The one-day training of surveyors (campaign monitoring team [CMT]) was insufficient and as a result, there was inadequate time for simulation exercises and some important aspects were not fully understood (such as the use of Google Maps links to identify the selected area for interviews, household definition, etc.).



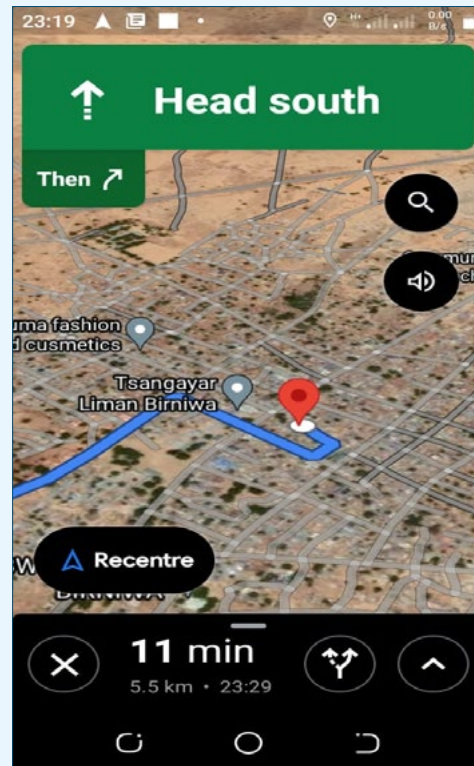
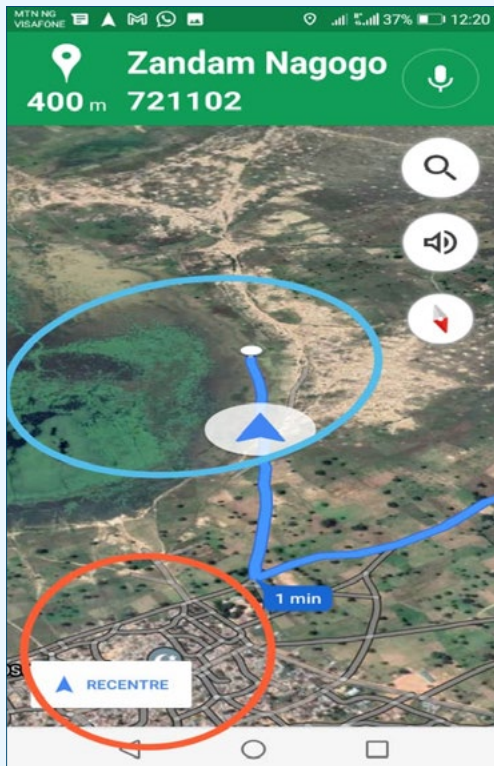
**Supervision:** The lack of real-time supervision resulted in data quality issues.



**Budget:** The transport budget allowed for two trips to the field for the two days of data collection. This, however, was insufficient to permit surveyors to return to the field to correct data which were identified as inaccurate or inadequate when the data were reviewed at central level.



**Internet network:** Poor connectivity or unavailability of internet in some locations hindered the use of Google Maps by the surveyors to locate the start point for the data collection.



Google links to the start point

The challenges with the training resulted in the following weaknesses:

- The technical team considered an entire ward as a cluster instead of the standard of continuous segmentation until a quadrant had an average of 20 households (ranging between 15—25 households).
- The trainers did not emphasize the definition of households in accordance with the campaign definition (i.e. every wife is a separate household in a polygamous setting), which resulted in some surveyors sampling the entire polygamous family as one household.
- The technical team relied solely on Google Maps for the segmentation and cluster selection which led to the replacement of a selected cluster if it was not on the map.

Ideally the team should have used other maps to identify the selected cluster rather than replace it.

- Some of the surveyors did not fully understand how to use the Google Maps link to identify the start point location.
- Difficulty in locating pre-selected settlements using Google Maps, as well as overlap of settlements.
- Some surveyors collected data for fewer than ten households.
- Some surveyors were sampling locations other than those on the Google Maps link.



Members of the survey team  
interviewing household representatives

# EVALUATION RESULTS

For the pilot of the modified end process approach in Jigawa, 2,293 households were sampled across the 27 LGAs. The LQAS was based on 80 households per lot with a three-level classification system: pass, intermediate and fail. The classification level cut-offs for the main household indicators were:

- 90 per cent/80 per cent for the four main indicators (resulting in three classification levels of 100—90 per cent, 80—90 per cent and below 80 per cent) for four main indicators (at least one ITN, population access to ITNs, use by total population in sampled household and use by children under five years of age).
- 80 per cent/60 per cent (resulting in three classification levels of 100—80 per cent, 80—60 per cent and below 60 per cent) for the indicator for “correct” number of ITNs received by households.

As shown in Table 1, the results indicate that:

- A total of 2,219 out of the 2,293 households were issued ITNs. This represents 96.77 per cent of households sampled
- 7,429 ITNs from the campaign were present in the sampled households (indicating a retention rate of 91.99 per cent) at the time of the assessment. 1,876 of these nets present in the households were from sources other than the most recent ITN mass campaign.
- Of all the nets present in the households, 5,896 ITNs were hung up for use (representing a hanging rate of 79.36 per cent).
- Utilization of ITNs was high among children under the age of five at 80.55 per cent; pregnant women at 83.01 per cent and others at 78.03 per cent (Table 1).

**Table 2:** Summary of the main indicators

Main indicators								
Level	Indicator	Database type	Point estimate	Confidence intervals		Sample size	Number of clusters	Design effect
State	At least one ITN	All	97	95	99	2,293	209	3.5
	Correct no. of ITN	All	69	66	73	2,241	209	3.8
	Access, % population	All	88	86	90	2,219	209	2.7
	Use, total	All	79	75	83	2,315	209	5.3
	Use, <5 years old	All	81	75	86	2,315	209	5.9

The modified strategy piloted in the Jigawa ITN mass campaign allowed for analysis of the data using a three-level classification system, classification level cut-offs, calculation of confidence intervals and design effects<sup>2</sup> which were not done in the previous end-process

evaluations. Further analysis for the correct number of ITNs per household and population access were also calculated to provide additional information for decision-making. Additional probes were possible using the modified strategy and the data analysis applications.



2. The design effect (denoted as  $deff$ ) is defined as the ratio of the variance of an estimate under a sampling plan to the variance of the same estimate from a simple random sample with same number of observation units.

The analysis indicated that household sampling through the LQAS process provided considerably more management value compared to the administrative data aggregated at the LGA level. Administrative indicators were consistently high (more than 95 per cent ITN issuance) across all LGAs with over 90 per cent ITN retention rate.

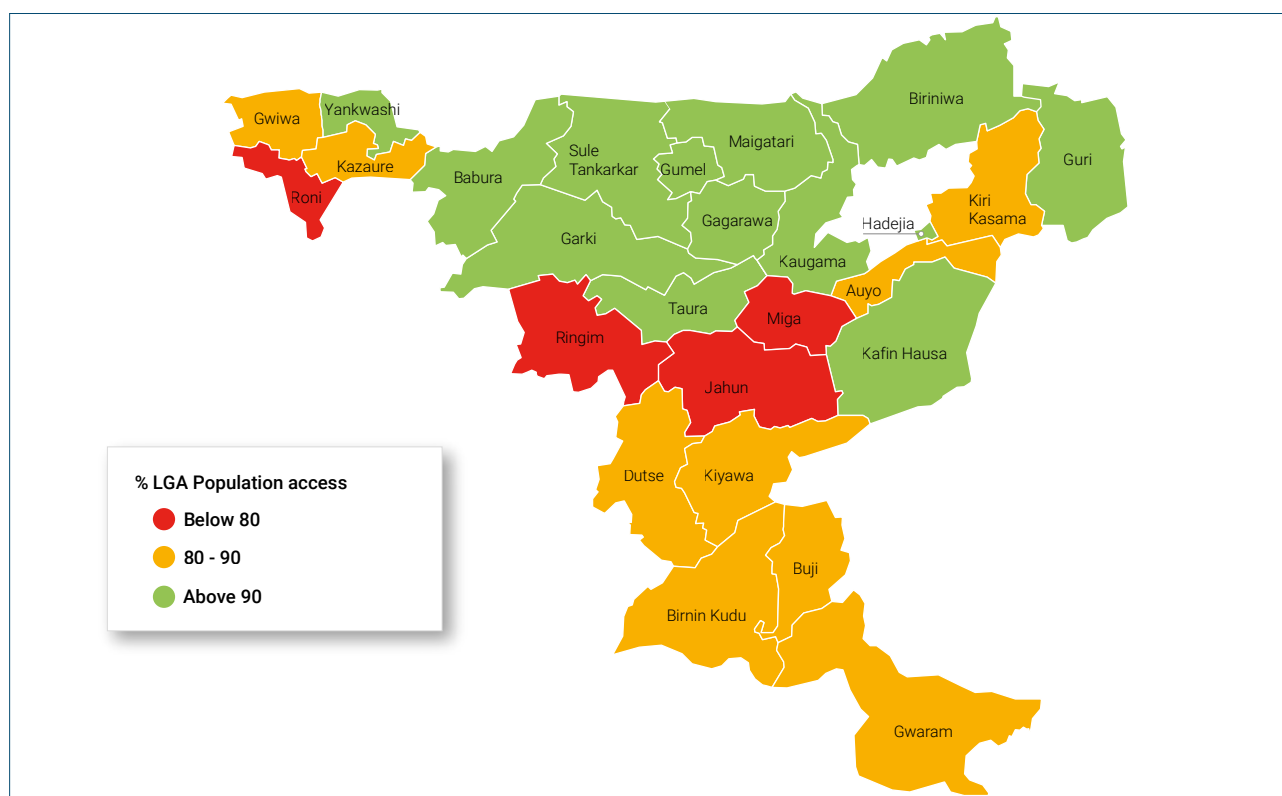
Overall results for the 27 LGAs showed that 25 per cent of the LGAs were very high performance (pass), 50 per cent LGAs were intermediate performance (intermediate) and 25 percent of the LGAs had very low performance (fail) (see Table 2 and Figure 1).

**Table 3:** LGA data for the five main indicators

LGA	At least one ITN	Correct no. of ITN	Population access	Use, total	Use, CU5 years	Average
	<b>90/80</b>	<b>80/60</b>	<b>90/80</b>	<b>90/80</b>	<b>90/80</b>	
Gagarawa	100%	97%	98%	100%	100%	99%
Birniwa	100%	87%	100%	100%	100%	97%
Kafin Hausa	100%	90%	98%	98%	99%	97%
Gumel	99%	91%	96%	96%	95%	95%
Kaugama	100%	79%	91%	99%	100%	94%
Sule Tankarkar	100%	90%	98%	87%	82%	91%
Yankwashi	99%	92%	96%	81%	86%	91%
Mallam Maduri	99%	75%	93%	88%	98%	91%
Babura	100%	71%	95%	96%	90%	90%
Maigatari	95%	71%	95%	95%	89%	89%
Kiri Kasamma	100%	66%	90%	85%	97%	88%
Birnin Kudu	96%	71%	87%	89%	91%	87%
Hadejia	99%	60%	81%	93%	99%	86%
Gwaram	96%	70%	83%	85%	93%	85%
Guri	96%	77%	93%	74%	69%	82%
Kazaure	100%	68%	88%	67%	74%	80%
Garki	100%	78%	95%	60%	64%	79%
Buji	90%	62%	83%	79%	79%	79%
Taura	98%	55%	93%	72%	72%	78%
Jahun	100%	44%	78%	83%	84%	78%
Gwiwa	95%	57%	89%	71%	73%	77%

LGA	At least one ITN	Correct no. of ITN	Population access	Use, total	Use, CU5 years	Average
	90/80	80/60	90/80	90/80	90/80	
Dutse	93%	57%	83%	65%	81%	76%
Ringim	88%	56%	71%	79%	81%	75%
Roni	92%	25%	78%	83%	84%	72%
Kiyawa	100%	68%	84%	50%	52%	71%
Auyo	92%	55%	87%	63%	47%	69%
Miga	87%	31%	77%	58%	61%	63%
<b>Legend:</b>	Pass		intermediate		Fail	

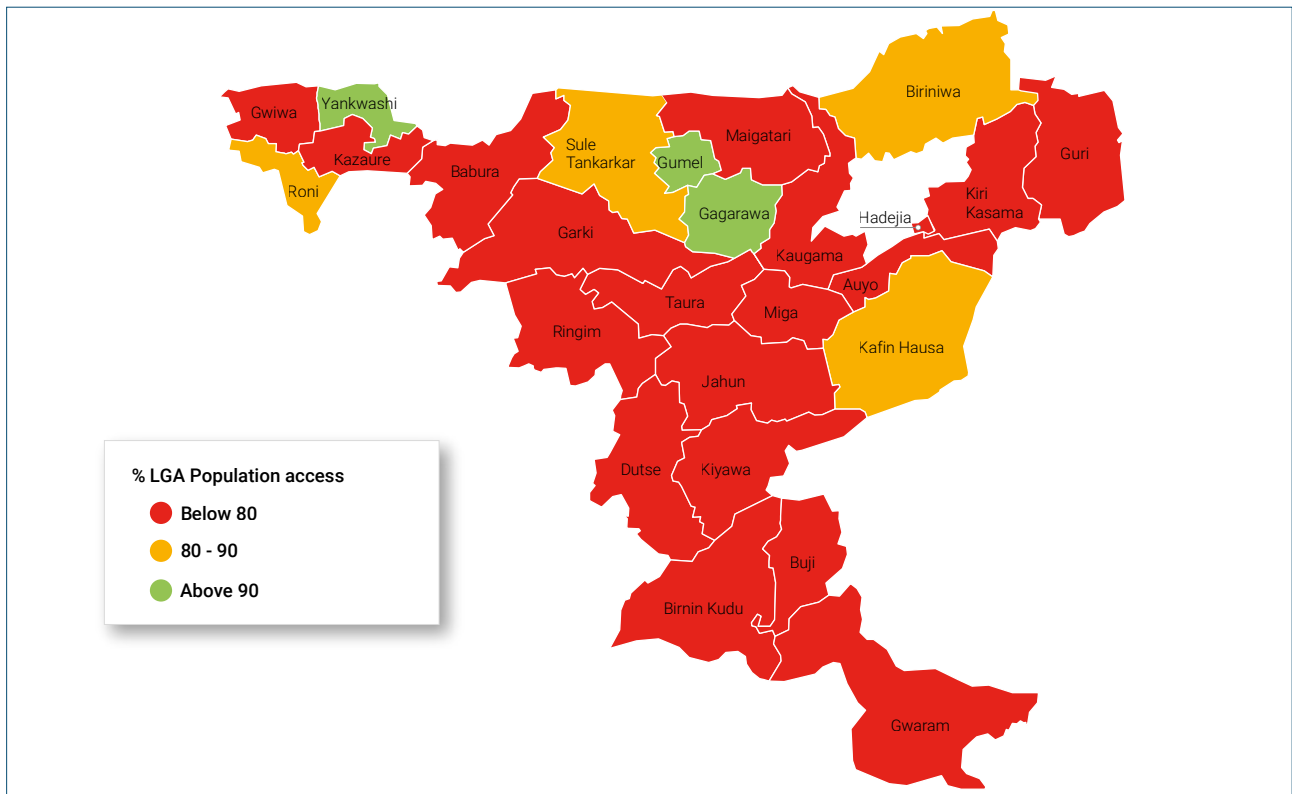
**Figure 1:** Percentage of population access to ITNs by LGA, Jigawa State



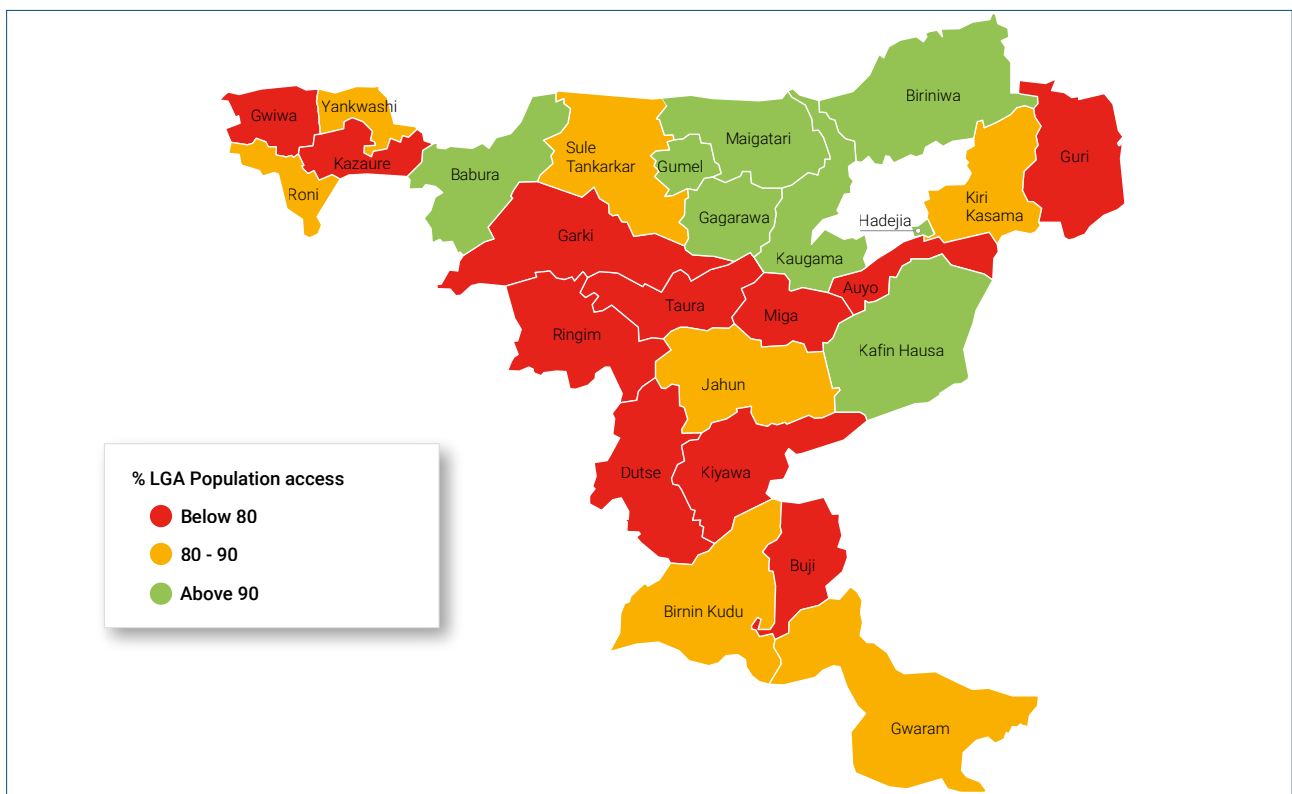
The large differences in ITN use (high and very low) between LGAs within the state indicate an important management opportunity to examine reasons and to spur appropriate actions. The LQAS data by household (the percentage of households that received the correct number of campaign ITNs according to the campaign allocation rules [see Figure 2]) showed that only three LGAs (20 per cent) passed, eight

LGAs (54 per cent) were intermediate and four LGAs (26 per cent) failed. The NMEP needs to investigate the reason for the incorrect allocation and establish a mitigation measure for future campaigns. In addition, LGAs with high access to ITNs but low use (Figure 3) should be further investigated to understand the challenges and to guide NMEP in tailoring SBC activities.

**Figure 2:** Percentage of correct number of ITNs by LGA



**Figure 3:** Percentage of ITN use by LGA



# RECOMMENDATIONS

Based on interaction with the technical team, reports and the evaluation results, a number of recommendations could be considered by the NMEP to strengthen selected aspects of campaign end-process monitoring (Table 3).

**Table 3:** Recommendations for strengthening end-process monitoring

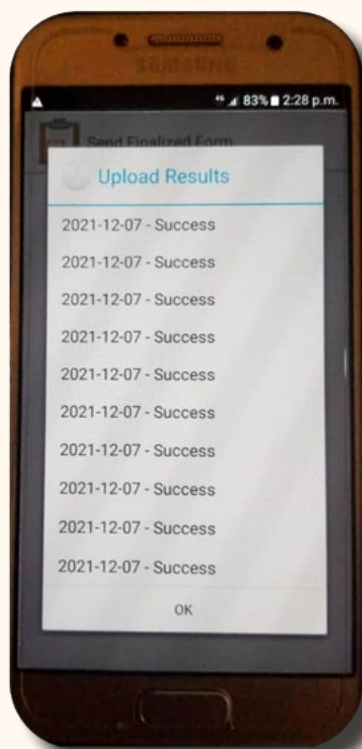
Theme	Recommendations
<b>Capacity-building</b>	<ul style="list-style-type: none"> <li>● There should be an extensive, practical training for the campaign technical team on the modified end-process strategy.</li> <li>● The training for the surveyors needs to be enhanced and more time allocated for simulation, use of Google Maps links, household definition and other key aspects.</li> <li>● There is a need to build capacity of NMEP and its implementing partners on the use of back-up methods for segmentation (e.g. crude maps) for cluster selection and data analysis using software for complex surveys.</li> </ul>
<b>Sample/cluster selection</b>	<ul style="list-style-type: none"> <li>● Cluster selection should be done early to allow for appropriate budgeting for surveyors going to difficult terrain or hard-to-reach areas.</li> <li>● For each of the eight selected lots, multiple rounds of equal-size segmentation should be conducted to reach one final segment with 20 households (15—25 households), after which households should be listed and numbered on a field map.</li> </ul>
<b>Tools/materials</b>	<ul style="list-style-type: none"> <li>● Four-point coordinates (indicating the boundary of the quadrant) should be provided to the surveyors to allow for household selection within the selected quadrant.</li> <li>● The surveyors should be given both Google Maps links and offline/paper maps to use in identifying cluster locations to have a backup in a case of network issues in the location.</li> <li>● The data entry tool on the devices should be configured in such a way that only data for 10 households per lot can be recorded (apart from the unavailable households/households that refuse to be interviewed).</li> </ul>
<b>Supervision</b>	<ul style="list-style-type: none"> <li>● Real-time supervision of the surveyors should be done to identify issues and a real-time feedback mechanism should be in place to communicate appropriate corrections when the surveyors are still in the field.</li> </ul>
<b>Data analysis</b>	<ul style="list-style-type: none"> <li>● The NMEP should identify a focal person responsible for data analysis and capacity-building of technical teams supporting the ITN mass campaign.</li> </ul>
<b>Post data analysis</b>	<ul style="list-style-type: none"> <li>● The NMEP should establish a plan to investigate and address issues identified post data analysis, as well as disseminate the findings from which implementing partners planning for future campaigns can learn.</li> </ul>

# CONCLUSION

The use of the modified protocol for end-process evaluation was overall a success. The data analysed provided information on areas of the ITN campaign that went well and areas that can be improved. The analysis showed the benefits of mapping and visualization of data by LGA. This analysis also showed the benefits of having household-level electronic data at national level. With the electronic tools available for data collection, transmission, storage and analysis, the NMEP was able to manage household-level LQAS data at the national level. The advantages of the household-level data include:

- LGAs were assigned classifications (pass, intermediate, fail) based on some key indicators (ITN access and correct number of ITNs) allowing the NMEP to quickly visualize performance of individual LGAs.
- Confidence intervals at the state level for all indicators were calculated.
- All indicators could be analysed and more complex analyses could be conducted, including combinations of more than one indicator or data element, at LGA and state levels.

The NMEP should establish a clear plan for next steps and how to implement recommendations in future campaign with the findings from the pilot.



© Malaria Consortium, Nigeria

*Data successfully uploaded to the Cloud*



## AMP CONTACTS

To join the weekly AMP conference call each Wednesday at 10:00 AM Eastern time (16.00 PM CET) use the following Zoom meeting line:

<https://us06web.zoom.us/j/2367777867?pwd=a1lhZk9kQmcxMXNaWnRaN1JCUTQ3dz09>

You can find your local number to join the weekly call:

<https://zoom.us/j/2367777867>

To be added to the AMP mailing list visit:

<https://allianceformalariaprevention.com/weekly-conference-call/signup-for-our-mailing-list/>

To contact AMP or join an AMP working group please e-mail:

[allianceformalariaprevention@gmail.com](mailto:allianceformalariaprevention@gmail.com)

For further information please go to the AMP website:

<https://allianceformalariaprevention.com>