



NIGERIA CASE STUDY

TARGETED URBAN INSECTICIDE-TREATED NET
(ITN) DISTRIBUTION: AN EVIDENCE-DRIVEN
APPROACH TO OPTIMIZING MALARIA RESOURCES

AUGUST 2026

amp | The Alliance for
Malaria Prevention
Expanding the ownership and use of mosquito nets

Cover photo: Household sensitization by Community Mobilizers and Distributors (CMD) during the door-to-door mobilization and ITN distribution process. © Kwara SMEP

Back cover photo: Monitoring of mobilization and ITN distribution team by the Honourable Commissioner for Health, Kwara State. © Kwara SMEP



CONTENTS

BACKGROUND	3	SUCCESSES	11
Sub-national tailoring and prioritization	4	CHALLENGES	12
Piloting the targeted urban ITN distribution framework in Ilorin, Kwara State	5	RECOMMENDATIONS	12
Pilot outcomes	6	CONCLUSION	13
Lessons learned from the pilot	6	ANNEX 1	14
Scaling up urban ITN targeted distribution to other states	6		
Criteria for identifying non-targeted areas for ITN mass campaigns	7		

BACKGROUND

This case study outlines Nigeria's innovative approach to targeted urban ITN distribution, implemented by the National Malaria Elimination Programme (NMEP) in collaboration with the State Malaria Elimination Programmes (SMEPs), community stakeholders and partners.

Nigeria, a malaria-endemic country that accounts for 27% of global malaria cases¹ and has a rapidly growing and urbanizing population, faces significant challenges in ensuring that ITNs procured with available funding are distributed in a way that maximizes impact among populations at risk. Compared with rural areas, malaria transmission in urban settings is often lower but more heterogeneous and focal, with higher-risk pockets in peri-urban or underserved communities where factors such as population mobility, poor drainage, substandard housing and environmental conditions may sustain transmission². Malaria control in urban areas in Africa is also challenged by the recent invasion and expansion of *Anopheles stephensi*, a vector of urban malaria.

ITN distribution remains one of the core prevention interventions implemented by the Federal Ministry of Health and Social Welfare through the NMEP, alongside a broader package of interventions that includes case management, chemoprevention, surveillance, monitoring and evaluation, social and behaviour change (SBC), and complementary vector control measures such as indoor residual spraying (IRS) and, where appropriate, larval source management (LSM).

Under leadership of the Government of Nigeria and with support from donors and technical partners, malaria incidence has declined from 402 per 1,000 population in 2000 to 299 per 1,000 in 2023³. Despite progress in reducing the malaria burden, over time the funding available has become insufficient to meet the needs of a growing population and sustain universal implementation of malaria interventions across all eligible populations. In response to the resource constraints, the NMEP has adopted different approaches, focused on achieving and sustaining impact and reaching underserved

populations, namely:

- Reviewing and refining targets and quantification for malaria prevention interventions, including ITNs, based on available resources and updated risk data.
- Designing and implementing innovative strategies, leveraging Local Government Area (LGA), state and national data and implementation experiences to test and assess approaches that reduce operational costs.

As part of sub-national tailoring and prioritization to guide strategic resource allocation, urban areas were identified in many states as having lower malaria prevalence than settlements outside urban centres and of being lower priority for campaign ITNs. At the same time, urban areas are recognized as having distinct operational and contextual challenges for malaria prevention efforts, including difficulties in planning and implementation of mass campaigns, due to:

- Inaccurate quantification due to rapid urbanization, leading to poor denominators for estimation of commodities, human resources and other implementation needs.
- Rapid shifts in settlement patterns, including shanty towns and slum areas where new “communities” are formed that are not part of official census and urban planning information.
- Dense population with heterogeneous malaria risk levels in different areas (e.g. high-rise residential areas located near lower-income worker settlements with different malaria risk profiles).
- Limited/restricted access for malaria programme workers to some settlements due to physical, security or administrative barriers, including informal settlements and gated or high-security residential areas.

These complexities require more tailored, evidence-driven and adaptive strategies to effectively target malaria in such environments and ensure that available resources are directed where they will contribute most to reducing the malaria burden.

1. WHO. Malaria 2024 Country Profile. From World Malaria Report 2024. <https://www.who.int/publications/m/item/malaria-2024-nga-country-profile>

2. Keiser, J., Utzinger, J., de Castro, M.C., Smith, T.A., Tanner, M. and Singer, B.H. (2004). Urbanization in sub-Saharan Africa and implication for malaria control. *The American Journal of Tropical Medicine and Hygiene*, 71(2 Suppl), 118–127. <https://doi.org/10.4269/ajtmh.2004.71.118>

3. World bank global health observatory 2025. <https://data.worldbank.org/indicator/SH.MLR.INCD.P3?end=2023&locations=NG&start=2000>

Sub-national tailoring and prioritization

Given Nigeria’s high malaria burden and insufficient resources to implement all interventions at full scale in all locations, the NMEP and partners,

including the World Health Organization (WHO), undertook a malaria programme review followed by sub-national tailoring (SNT) and prioritization.

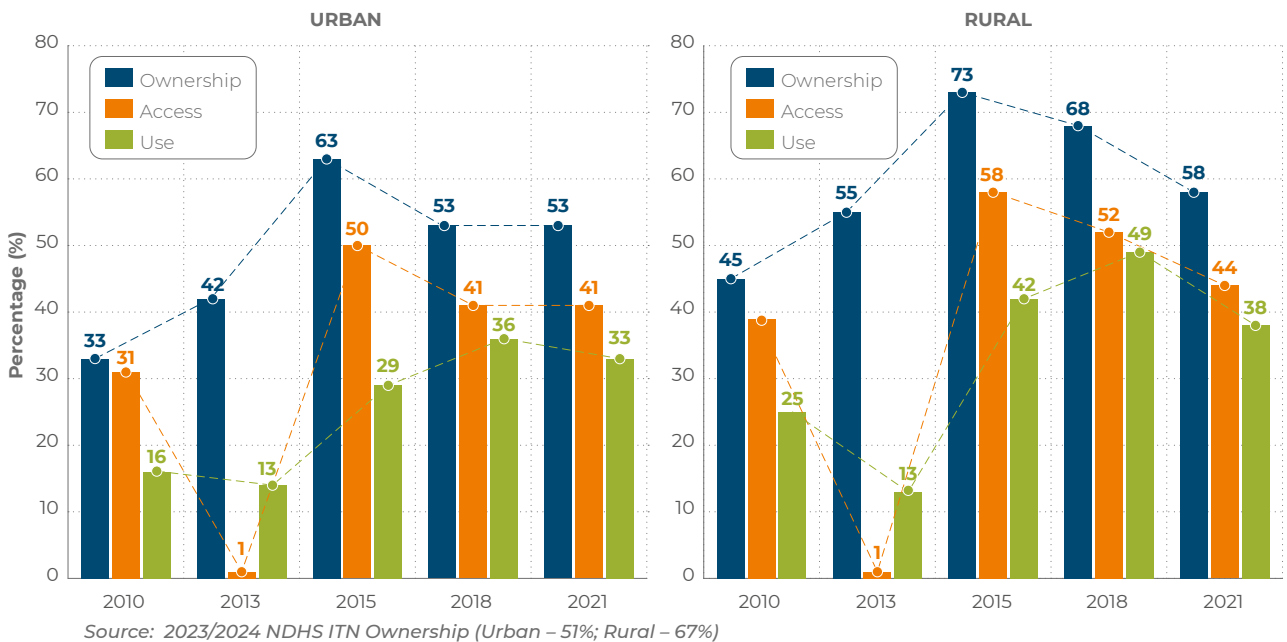
SNT uses localized evidence, including malaria prevalence, vector species, insecticide resistance, intervention coverage and health system context to identify the most appropriate package of interventions for different geographical areas. Prioritization then applies this localized evidence within the context of available resources, operational feasibility, health system capacity and programme

objectives to determine where and to what extent an intervention should be implemented, thereby maximizing impact and value for money. Following SNT and prioritization, the NMEP and SMEPs work to implement and operationalize decisions taken regarding interventions and activities at sub-national levels.

During the Global Fund’s Grant Cycle 7 process (GC7) for malaria, insufficient funding led to a decision by the NMEP, in collaboration with the Global Fund Country Team, to procure ITNs sufficient to cover 70% of the estimated campaign need in the Global Fund-supported states (i.e. quantification was based on state population divided by 1.8 x 0.7). This reduced the quantity of nets to be procured and created the operational challenge of determining how to allocate available ITNs to areas where they would have the greatest impact. To optimize the use of available ITNs, the NMEP reevaluated its mass campaign distribution strategy by reviewing national trends in ITN ownership, access and use across urban and rural popula-

tions (as seen in Figure 1), alongside malaria risk mapping and other epidemiological and operational indicators. While Figure 1 provided contextual information on patterns of ITN coverage over time, these data were not used in isolation to guide targeting decisions. Rather, the non-targeting of selected lower-risk urban communities during mass ITN distribution campaigns was informed by a broader assessment of malaria epidemiology, transmission risk and operational considerations. This evidence-informed approach enabled the NMEP to prioritize populations at highest malaria risk while allowing others to maintain access to ITNs through routine and other continuous distribution channels, where appropriate.

Figure 1: ITN ownership, access and use for urban and rural areas in Nigeria



Piloting the targeted urban ITN distribution framework in Ilorin, Kwara State

The second step, designed to validate a mixed-method framework, was a pilot conducted in Ilorin, Kwara State. Supported by the Gates Foundation and implemented under the leadership of the NMEP, in collaboration with WHO and the urban malaria research team at Loyola University, the pilot drew on earlier research initiated by Prof. Ifeoma Ozodiegwu and colleagues, whose findings on settlement classification and urban malaria risk in Kwara State were later published in 2025⁴. The pilot aimed to test the feasibility of a data-driven, community-validated framework for identifying urban settlements with different malaria risk profiles and to use the result to prioritize ITN distribution with limited resources.

A participatory action research approach, combined with abductive inquiry, was used to co-design a framework. This approach involved engaging community members as co-researchers and combining available data, field observations, expert judgement and stakeholder interpretation to develop the most reasonable explanation or decision even with incomplete evidence. The process unfolded in three phases:

1. Planning: Development of classification criteria for urban wards, incorporating settlement type and environmental indicators. A settlement was identified as a localized population cluster within a ward or community, categorized on density of residences, infrastructure and environmental attributes into formal, informal or slum types. The environmental indicators are variables that help show whether an urban ward or settlement has conditions that may support or reduce malaria transmission. These indicators, including Enhanced Vegetation Index (EVI)⁵, population density, proximity to mosquito breeding sites, settlement type, land-use pattern and housing quality, are measured alongside epidemiological, demographic, housing and community validation data.

2. Data review and co-decision-making:

Malaria risk mapping was conducted using the above variables, as well as:

- ✦ Under-five malaria test positivity rates (TPR)
- ✦ Malaria case data from the Health Management Information System (HMIS)

These data were processed using a classification algorithm within a web-based interactive risk mapping tool.

3. Implementation: Settlements were then categorized into formal, informal or slum types and decisions were validated by malaria community stakeholders. The validation process involved selected stakeholders from the SMEP and LGA Primary Health Care (PHC) department, who visited wards and communities preliminarily identified as non-targeted for ITN distribution. These visits were conducted to observe, test and validate the settlements classified as either formal, informal or slum, based on agreed criteria (as captured in the validation checklist in Annex 1). Malaria risk scores were computed at the ward level, and a dialogue between state malaria stakeholders and partners was used to finalize risk maps for targeting.

Additionally, data from the Ozodiegwu et al. study were analysed to assess whether locally derived settlement definitions could improve urban-malaria risk stratification.

The algorithm identified three communities across two wards (Akanbi 4, located in Ilorin South and Are 2, located in Ilorin East) as consistently having low malaria risk scores. This finding was corroborated during the multi-stakeholder dialogue. Following community validation, a total of 27 communities within these areas were identified for exclusion from ITN mass distribution. They were, however, still eligible for Seasonal Malaria Chemoprevention (SMC) which was integrated into the ITN mass distribution campaign.

4. Ozodiegwu, I.D., Mhlanga, L., Bamgboye, E.A. et al. Co-creation and application of a framework for the de-prioritization of urban communities during insecticide-treated bed net mass campaigns for malaria prevention and control in Kwara State, Nigeria. *BMC Glob. Public Health* 3, 11 (2025). <https://doi.org/10.1186/s44263-025-00126-https://bmcclobalpublichealth.biomedcentral.com/articles/10.1186/s44263-025-00126-0>

5. A satellite-derived measure of vegetation greenness and biomass to see how much land is under cultivation.

Planning and operational adjustments were then made:

- Microplanning templates, implementation manuals and training materials were revised to exclude these communities for ITN mass distribution.

- Tailored social and behaviour change messaging was developed to manage community expectations, particularly because households with children under five in these communities were still expected to make them available for Sulfadoxine-Pyrimethamine plus Amodiaquine (SPAQ) administration.

Pilot outcomes

The Kwara State campaign was implemented in all LGAs and wards other than the 27 communities excluded from the mass distribution in two urban wards. Of the sixteen LGAs in the state, five LGAs implemented a standalone ITN distribution campaign while eleven LGAs implemented an integrated SMC/ITN campaign.

Findings from the unpublished Kwara State 2023 ITN campaign report indicated that Sulfadoxine-Pyrimethamine and Amodiaquine

(SPAQ) administration continued in communities not targeted for ITN mass distribution and that, despite not receiving ITNs, community acceptance of the targeted approach was generally high and no rejection of SPAQ was noted in households that did not receive ITNs. These findings were participant-reported and should be interpreted as programme feedback rather than independently verified coverage estimates.

Lessons learned from the pilot

ITN targeted distribution at the community level proved technically and operationally complex, and higher administrative units, such as wards or LGAs should therefore be considered for scalable implementation.

The term “deprioritization” that was used during the pilot was perceived as having a negative tone. To promote clearer and more positive messaging, neutral terms such as “reprioritization” or

“targeted ITN distribution” were recommended for scale up and future implementation.

Concurrent with the Kwara pilot, the NMEP had initiated efforts to develop an urban malaria strategy as part of its broader SNT initiative. This provided an opportunity to align the ITN targeting approach for mass campaigns with longer-term strategic goals, beyond addressing immediate resource constraints.



Scaling up urban ITN targeted distribution to other states

Building on insights and lessons from the Kwara State pilot, the NMEP refined and scaled up the urban targeted ITN distribution framework. The approach was simplified and subsequently deployed in Gombe, Jigawa and Ogun in 2024, and further scaled up to Delta, Kaduna, Kano, Katsina, Niger, Taraba and Yobe in 2025.

While the original ITN targeting strategy emerged in response to a 30% reduction in ITN procurement budget for the Global Fund-supported states, the refined approach evolved beyond that specific per cent reduction into a broader framework for guiding ITN allocation using urban classification, malaria risk data and available resources.

Criteria for identifying non-targeted areas for ITN mass campaigns

To focus mass campaign distribution where it was most needed to reduce the malaria burden, a systematic approach was adopted to identify low-risk urban areas. Urban classification was set at the ward level, providing a structured and standardized administrative basis for decision-making. Risk analysis drew on multiple data sources, including malaria prevalence, housing quality, population density, mobility patterns and the presence of informal settlements.

Publicly available data including EVI, under-five years TPR and housing quality were collected for wards across selected campaign states. These indicators were used to assess malaria transmission risk. A composite risk score was generated for each ward, enabling ranking from low to high malaria risk. In some cases, modelled malaria prevalence estimates, informed by satellite-derived environmental data and machine learning models, were used to inform these rankings.

Urbanization thresholds were also applied. ITN targeting scenarios were assessed based on whether 50% or 75% of a ward's land use was classified as urban. Ultimately, the 75% threshold was recommended to identify wards with consistently urban characteristics and lower malaria risk. However, where the 75% threshold identified too few wards to align with the available ITNs, the 50% threshold was considered. In rare cases, a lower threshold was applied, provi-

ded that final decisions were guided by malaria risk ranking scores, on-site verification, stakeholder validation and the objective of directing available ITNs to populations at greatest risk.

Several characteristics of urban settlements informed urban classification and interpretation of malaria risk data:

- **Settlement characteristics and built environment:** Settlement type, housing quality, drainage conditions and surrounding environmental features were used to interpret malaria risk in urban areas. In better-planned urban settlements with improved housing and drainage, conditions that support mosquito breeding and human-vector contact may be reduced. Conversely, informal or underserved peri-urban settlements with poor drainage, overcrowding and substandard housing may have higher human-vector contact. These characteristics helped inform urban classification and were considered alongside epidemiological indicators, environmental data and community validation during targeting decisions⁶.
- **Community health awareness and care-seeking behaviour:** Health awareness, literacy and care-seeking behaviour may vary widely across urban settings, particularly between formal urban areas, informal settlements and underserved peri-urban communities. These factors were therefore not

6. Keiser, J., Utzinger, J., Caldas de Castro, M., Smith, T. A., Tanner, M., & Singer, B. H. (2004). Urbanization in sub-Saharan Africa and implication for malaria control. *The American Journal of Tropical Medicine and Hygiene*, 71(2_suppl), 118–127. <https://doi.org/10.4269/ajtmh.2004.71.118>

treated as uniform characteristics of urban populations but considered as contextual issues that could influence ITN use and community acceptance. During targeting decision-making, these considerations were interpreted alongside malaria risk indicators, settlement classification, environmental data and community validation⁷.

- **Household and community-level vector prevention practices:** Some urban households, particularly in better-served or higher-income areas, may use additional protective measures such as window and door screening, insecticide aerosols, coils, repellents, fans, air conditioning and environmental clean-up. However, these practices vary widely across urban settings and should not be assumed to apply uniformly, especially in informal or underserved peri-urban settlements. In the targeting process, such contextual factors should be interpreted alongside malaria risk indicators, settlement classification, environmental data and community validation⁸.
- **Facilitated monitoring and surveillance:** Urban settings may have stronger communication and digital infrastructure that can support more timely monitoring of intervention delivery and programme performance. Where routine reporting systems, including contributions from both public and private health providers, are functioning effectively, this infrastructure may also facilitate more timely surveillance of malaria cases and programme evaluation.
- **Improved healthcare infrastructure:** Access to healthcare services as a foundational component of malaria control is generally better in urban areas due to the proximity and density of healthcare facilities. This enables timely diagnosis, treatment and outbreak response, contributing to the overall reduction of malaria burden⁹.

The identification of urban areas for ITN targeting incorporated several steps:

- **Stakeholder engagement:** Early engagement of high-level stakeholders, including state and local government officials, was essential to build support and ownership of the ITN targeting process.
- **Data-driven risk mapping:** Risk maps were created using a combination of EVI, TPR, settlement classification and model-predicted malaria prevalence based on satellite and environmental data.
- **Community validation:** Identified low-risk wards were validated through community engagement, involving local leaders and health teams. Field verification by State Ministry of Health (SMoH) teams further ensured the accuracy of settlement classification and the credibility of the process.
- **Criteria for non-targeting through ITN mass distribution campaign:** Wards that met the urban threshold (defined as having greater than or equal to 75% urban land use) and consistently demonstrated low malaria risk indicators, such as high-quality housing, low TPR and limited proximity to mosquito breeding sites, were designated as non-target areas for ITN mass distribution campaigns. Figure 2 illustrates the application of the 50% and 75% urban settlement thresholds in Kaduna State, highlighting the wards identified as non-target areas under each scenario.

Under the expanded framework, ITN targeting for mass campaigns focused on urban wards where at least 75% of settlements met defined urban criteria (as illustrated in Figures 2 and 3). However, this threshold was adapted in some states during microplanning to reflect local context and operational realities. States such as Yobe presented implementation challenges due to the predominantly rural composition of wards across the state. As shown in Figure 3, relatively few wards met the $\geq 75\%$ threshold, limiting the practicality of this criterion. In response, the urban settlement classification

7. Worrall E, Basu S, Hanson K. Is malaria a disease of poverty? A review of the literature. *Trop Med Int Health*. 2005 Oct;10(10):1047-59. doi: 10.1111/j.1365-3156.2005.01476.x. PMID: 16185240. <https://pubmed.ncbi.nlm.nih.gov/16185240/>

8. WHO. (2019). *World malaria report 2019*. Geneva: World Health Organization. <https://www.who.int/publications/i/item/9789241565721>

9. WHO. (2024). *Global Malaria programme operational Strategy 2024–2030*. Geneva: World Health Organization. <https://www.who.int/publications/i/item/9789240090149?utm>

threshold was adjusted to 50% to enable more nuanced ITN targeting while balancing malaria

risk, operational feasibility, available ITN stock and local implementation realities.

Figure 2: Map of wards in Kaduna State not targeted for ITN mass distribution, using scenarios where at least 50% and 75% of settlements are urban

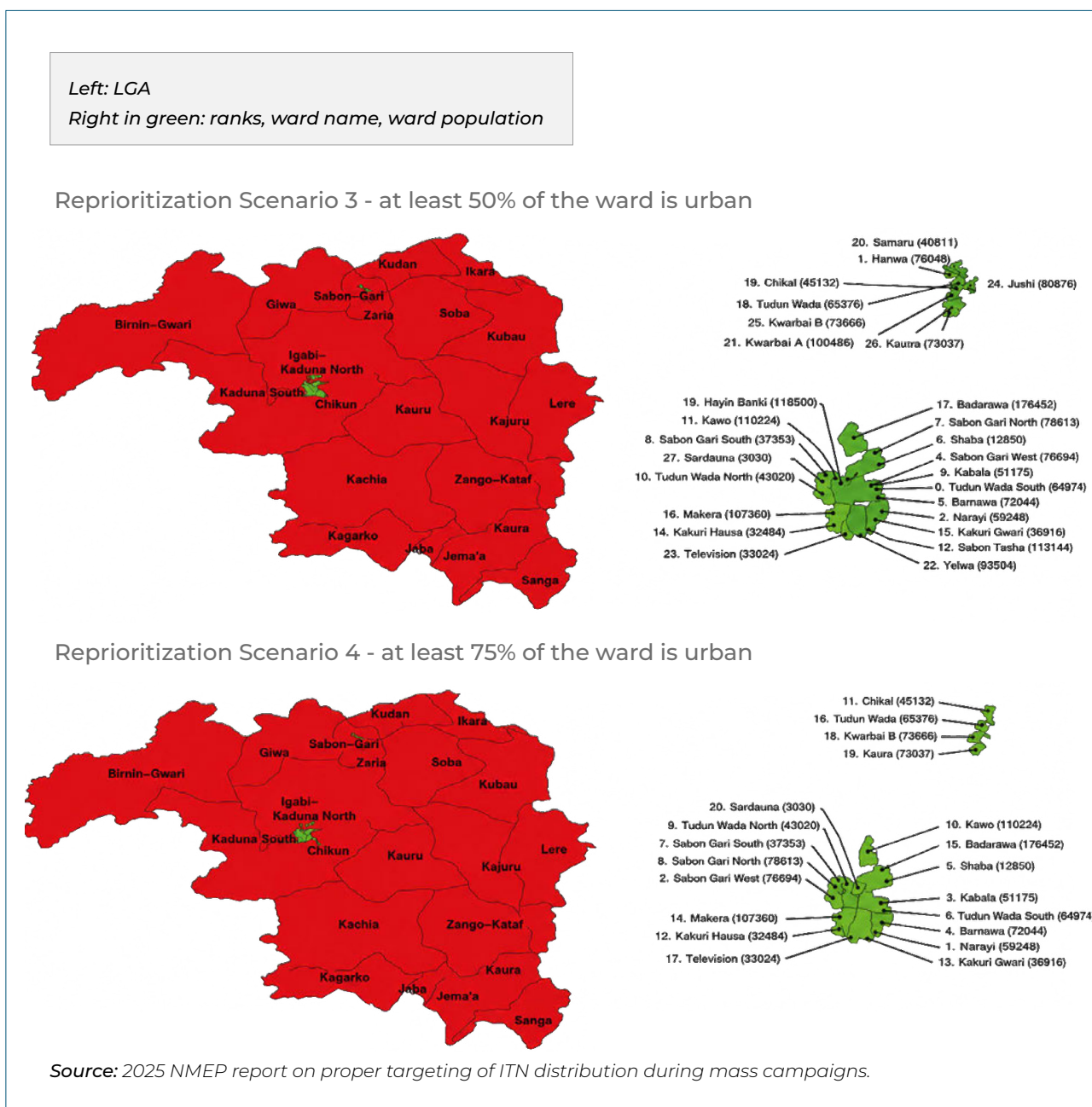
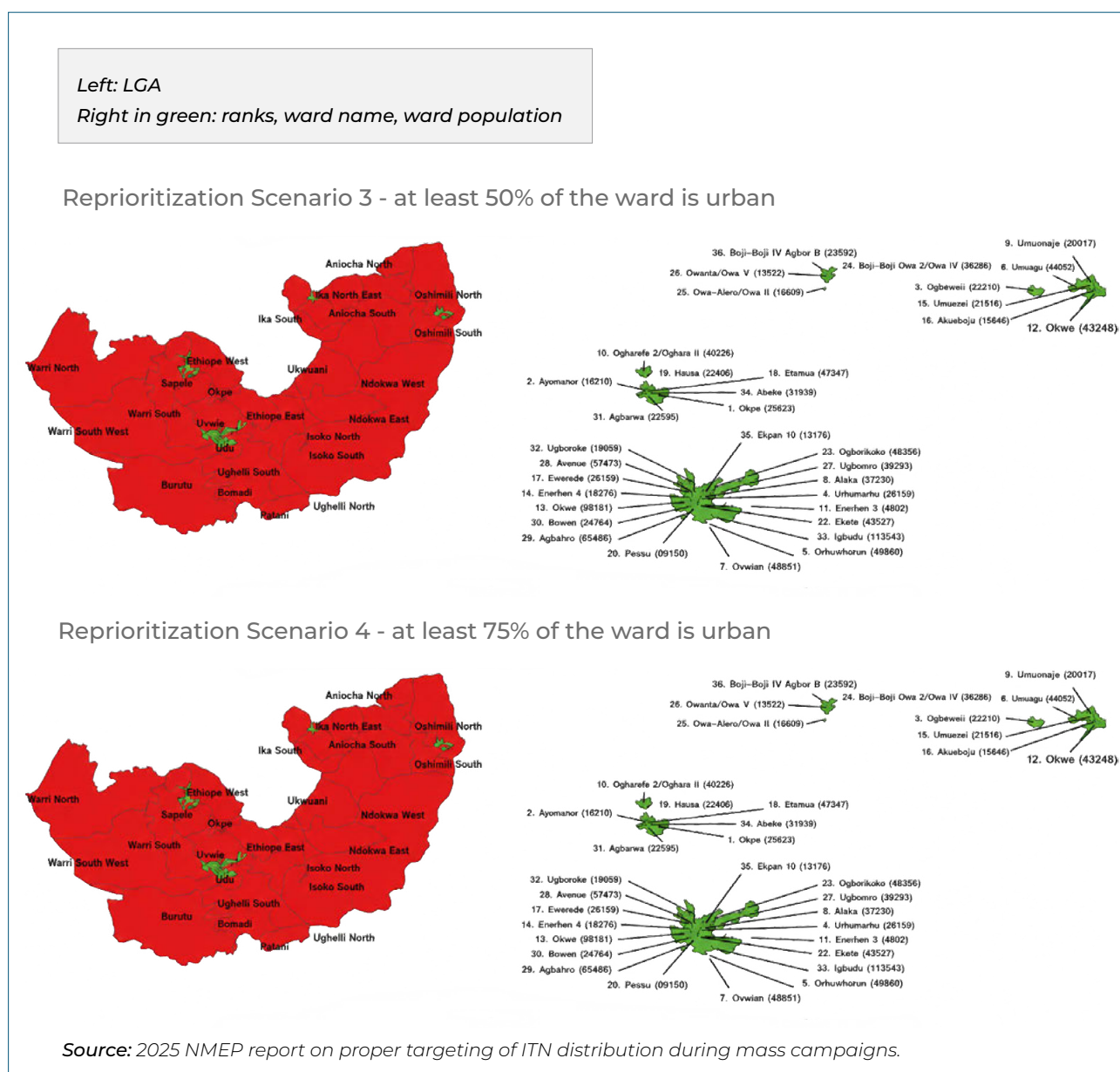


Figure 3: Map of wards in Delta State, not targeted for ITN distribution, using scenarios where at least 50% and 75% of settlements are urban



This flexible and context-specific application of the urban ITN targeting strategy in mass campaigns represented an important step in integrating malaria risk data, settlement charac-

teristics, state and LGA context and operational constraints into national ITN campaign planning.

SUCCESS

1. Alignment with WHO guiding principles:

Nigeria's approach translated WHO guidance on prioritization in resource-constrained settings¹⁰ into an operational decision-making process for ITN mass campaigns. By combining burden stratification, malaria risk mapping, cost-efficiency considerations and evidence-based intervention selection, the approach supported targeted allocation of ITNs to areas where they were expected to have the greatest public health impact.

2. Data and technology-driven decision-making:

Field study data, combined with variables such as EVI, malaria test positivity rates among children under five and housing quality indicators, were analysed using machine learning approaches to model malaria risk, support risk stratification and identify wards for ITN mass campaign targeting.

3. In-field validation for data verification and equity:

- Improved confidence in ITN mass campaign targeting data by allowing field teams to cross-check model outputs with on-the-ground conditions and to ensure decisions reflected actual malaria risk, rather than relying only on algorithmic predictions.
- Enhanced transparency through field validation by personnel from the state and relevant LGA authorities made the decision-making process evidence-based and traceable. This strengthened ownership by allowing local officials, community representatives and technical partners to understand how ITN mass campaign targeting outcomes were derived.
- Strengthened fairness and corrected misclassifications that could have excluded high-risk areas or prioritized lower-risk ones for inclusion in the campaign, supporting resource allocation based on need.
- Community and stakeholder trust built, and resistance minimized through the visible commitment of verifying data, reduced perception of bias and improved acceptance of the targeted ITN distribution decisions.

- Supported smooth implementation by securing greater buy-in from local leaders and community stakeholders.

4. Scalability and operational feasibility:

- The framework's refinement and replication in other states demonstrates its adaptability.
- Incorporating field verification and feedback loops can further refine boundaries and targeting without adding unnecessary operational burden.

5. Operational cost-efficiency was achieved by aligning ITN procurement and operational campaign planning with available resources, enabling lower-risk areas to be served through other continuous delivery channels while reducing reliance on mass campaign distribution, thereby reducing costs associated with ITN distribution through mass campaigns.

6. Collaboration between the NMEP, academic partners and local stakeholders, combined with stakeholder-led validation, strengthened local ownership, built community trust and enhanced operational feasibility.

7. Urban-rural transmission differences:

Observed urban-rural transmission differences supported the rationale for targeted urban ITN distribution. Urban malaria transmission was more focal, linked with characteristics of peri-urban settlements and housing quality, allowing resources to be directed where they mattered most (high-risk hotspots).

8. Building acceptance through communication:

- The use of neutral terminology such as "reprioritization" or "targeted ITN distribution" instead of "deprioritization" helped build community buy-in and reduced perceptions of exclusion or bias.
- Proactive rumour management, through town announcers and LGA hotlines, further mitigated misinformation and strengthened community acceptance.

10. Guiding principles for prioritizing malaria interventions in resource-constrained country contexts to achieve maximum impact <https://www.who.int/publications/i/item/B09044?utm>

CHALLENGES

1. In some cases, gaps in ward-level data, particularly on malaria incidence, entomological indicators and settlement-level population estimates, limited the ability to conduct a comprehensive malaria risk assessment. However, the participatory action research approach largely mitigated this challenge.
2. Although routine health information systems in the pilot areas were relatively well established, the available data were not sufficient to isolate and measure the epidemiological impact of the targeted ITN distribution approach. In addition, the limited geographic scale and duration of the pilot reduced the ability to detect meaningful changes in malaria incidence that could be confidently attributed to the intervention.
3. Community resistance and pushback arose in a few areas in 2024, largely due to limited understanding of the targeted ITN mass campaign approach and insufficient early engagement with key stakeholders and community leaders. Although tailored SBC messages were aired before and during implementation, some communities perceived the approach as exclusionary, and one instance of heightened community tension was reported in Gombe State. In response, high-level stakeholder engagement was introduced ahead of subsequent campaigns to foster acceptance and reduce the risk of misunderstanding.

RECOMMENDATIONS

1. **Strategic alignment and complementary interventions:**
 - To sustain malaria prevention efforts in areas not targeted through ITN mass campaigns, implement or strengthen complementary interventions. These may include but are not limited to LSM, annual SMC, continuous ITN distribution through routine antenatal care (ANC) and the Expanded Programme on Immunization (EPI) services in health facilities and others. Additionally, environmental management activities such as routine environmental clean-up, clearing of drainage channels, and reduction of mosquito breeding sites should be prioritized to maintain low transmission risk.
 - Embed ITN targeting decision-making early in campaign planning processes and in digital tools to ensure smooth implementation and adaptability.
2. **Data and evidence generation:**
 - Strengthen evidence generation by improving routine malaria surveillance and data systems to enhance the quality, completeness and timeliness of malaria case reporting in both targeted and non-targeted areas, and conduct periodic assessments to monitor urban malaria trends and evaluate the epidemiological impact of the targeted ITN distribution approach. Explore the use of AI and predictive models to support dynamic risk mapping and identification of potential transmission hotspots.
 - Harmonize population data by partnering with the National Population Commission and integrating Geographic Information System (GIS) platforms for improved microplanning.
 - In addition to the web-based interactive risk-mapping tool used to pilot the targeted ITN distribution strategy based on malaria risk classification, programmes can also leverage the Malaria Programme Intervention and Optimization (MPIO) tool, proprietary to the NMEP, developed by the Clinton Health Access Initiative (CHAI), for ward-level malaria risk assessment and data-driven resource allocation, enabling more efficient targeting of ITNs to populations most in need

3. Scalability:

- ✧ For long-term sustainability, scale-up should be based on reliable, sufficient and validated data to support transparent and evidence-based targeting decisions.
- ✧ Scale-up should also include early community engagement and risk communication to promote acceptance and anticipate potential security or backlash risks in areas not targeted through mass campaigns.
- ✧ Lessons from early implementation in Gombe, Jigawa and Ogun States showed that targeting at a higher administrative level, such as wards or LGAs, reduces technical and logistical complexity compared with more granular settlement-level targeting.

4. Stakeholder engagement and community involvement:

- ✧ Engage policymakers early by organizing pre-campaign consultations or engagements to align on criteria for ITN targeting for mass campaigns and prevent political or community pushback.
- ✧ Promote community co-design by engaging and orientating local leaders as “malaria champions” to support risk map validation and deliver effective SBC messaging.

5. Social and behaviour change communication (SBCC):

- ✧ Strengthen SBCC messaging to emphasize net hanging, care and repair, promote access to ITNs through alternative distribution channels (as/where applicable), particularly in areas not targeted through ITN mass campaigns, and encourage positive health behaviours such as timely care-seeking for febrile illness and environmental clean-up.

6. Equitable access to ITNs and continuous monitoring:

- ✧ Promote equitable access to ITNs by implementing a multi-channel distribution approach that combines mass campaigns with continuous distribution channels, including routine distribution through health facilities and other platforms, including commercial sector, to maintain access to ITNs among eligible populations, particularly in areas not targeted for mass campaigns.
- ✧ Regular monitoring of this multi-channel distribution approach would help to ensure that no high-risk group is left behind.

7. Standardize the decision-making process:

- ✧ Utilize a clear tool, flowchart and/or standard operating procedure to enhance transparency, consistency and reproducibility of ITN targeting decisions.

CONCLUSION

Nigeria's experience demonstrates the value of sub-national tailoring, data- and evidence-driven targeting and community engagement in optimizing ITN mass campaign distribution in resource-constrained settings. In alignment with WHO's prioritization guidance, Nigeria has developed a model that may be relevant for other high-burden countries. However, implementation of the approach has underscored the need to address equity concerns for populations in non-targeted areas through strong alternative distribution channels, clear communication, monitoring and stakeholder engagement.

Though initially driven by funding limitations, the ITN targeting strategy has evolved into a core component of Nigeria's malaria elimination efforts to improve ITN distribution outcomes and impact and support more effective use of available resources.

ANNEX 1

NMEP checklist for validation of proposed non-prioritized areas for ITN distribution
(This is to be used for each ward – based on settlements in the ward)

State:	LGA:	Ward:	Data collector:	Date: / /
--------	------	-------	-----------------	-----------------

For each classification item answer the 'key questions' with one out of the three options that would best fit a description of the settlement. Enter the classification index number of the option selected under the 'Index score'. Sum up the total at the bottom of the table and match the total with the settlement type.

Serial No.	Classification elements	Key questions	Type of settlement [classification index]			Means of verification Tick ☐	Index SCORE
			Slum [1]	Informal settlement [2]	Formal settlement [3]		
1	Housing structure	■ What is the level of planning of the housing area? ■ What type of housing structures are built in the area?	■ The housing area is largely unplanned. ■ Houses are dilapidated buildings, and largely made of mud or zinc, or are huts.	■ Some areas are planned, and some unplanned. ■ Houses are small-sized residential buildings mixed with uncompleted or dilapidated houses.	■ The housing area is well-planned. ■ Houses are mostly gated or fenced and have air conditioners and window screens. ■ There are high-rise buildings.	PHOTOGRAPHS ☐ Houses ☐ Gated house ☐ High-rise building	
2	Property ownership	■ What is the predominant type of property ownership? Private or government? ■ Are property occupants mostly owners, renting or squatters?	■ Buildings are rented or temporary structures illegally erected and used.	■ There are rented apartments with a few owner-occupied houses.	■ Properties are mostly owner-occupied or rented out to government/formal private sector for use as offices.	INTERVIEWS with local residents ☐ Photograph ☐ Voice note	
3	Housing density	■ How close or far apart are the houses or living quarters within the settlement?	Houses are densely packed, with very clustered residential units.	Houses are mostly clustered together, with a few areas having spaces between houses.	Housing units are sparsely located. Some are within housing estates.	PHOTOGRAPHS ☐ Dense areas ☐ Mixed areas ☐ Spaced areas	
4	Government/ key facilities	■ Is there presence of government infrastructure and/or social amenities? ■ In what type of infrastructure are commercial activities carried out?	■ There are no government or key facilities except for PHC health facilities that may be in poor physical condition. ■ There are only open-air markets, kiosks and stalls.	■ There are only basic or simple government facilities such as LGA offices, and primary healthcare centres. ■ Commercial area has a few provision shops, and mainly open-air markets.	■ There is a built-up government infrastructure such as office complexes, and secondary health facilities. ■ Commercial area has banks, supermarkets and shopping malls that are well-maintained.	PHOTOGRAPHS ☐ Offices ☐ Health care ☐ Signposts ☐ Commercial	

Serial No.	Classification elements	Key questions	Type of settlement [classification index]			Means of verification Tick ☐	Index SCORE
			Slum [1]	Informal settlement [2]	Formal settlement [3]		
5	Security infrastructure	- Do houses have any form of security system? - Is there presence of an organized security unit?	- There are no houses with security apparatus. - Security in the neighbourhood relies on informal security arrangements.	- A few houses are equipped with security apparatus. - There are some security personnel employed within houses or serving neighbourhoods.	- Most houses have private security systems and are equipped with security apparatus like barbed wire fences, electric fences or security cameras. - There are security personnel employed within houses or serving neighbourhoods.	INTERVIEWS with local residents or security personnel ☐ Photograph ☐ Voice note	
6	Drinking water/ piped water	- Do households have and use piped water? - Are the available sources of water private or public?	Pipe-borne water is unavailable privately to households; most residents purchase from vendors or fetch from public taps, wells and streams.	Pipe-borne drinking water is available in only some compounds or houses, while others rely on wells or public borehole taps.	Pipe-borne drinking water is available in most houses and compounds.	PHOTOGRAPHS (w/ time stamp) ☐ Water sources	
7	Waste and sewage disposal/ management	- Do households have access to proper waste disposal methods? - Can the available toilet facilities be considered sanitary (hygienically prevent human contact)? What is the condition of the outdoor drainage system?	- Waste can be seen everywhere and is indiscriminately disposed of. - There are no sanitary toilet facilities for most households. - Overall waste management is very poor with no drainage systems.	- Proper refuse collection/ disposal methods and sanitary toilet facilities are present in only some houses in the area. - Overall waste management is poor, with bad drainage systems.	- Proper refuse collection/ disposal methods and sanitary toilet facilities are present and frequently used in most houses in the area. - Waste management, including outdoor drainage system, is satisfactory and meets public health standards.	PHOTOGRAPHS (w/ time stamp) ☐ Waste disposal ☐ Toilet facility ☐ Drainages	
8	Access roads	- Are there access roads? - What is the current and recent condition of access roads in the settlement?	There are few access roads, which are in a deplorable/ poor condition; there are no tarred roads, only muddy or stony pathways.	There are some access roads; some are tarred and are not well-maintained. Others are untarred dirt or muddy roads.	Access roads are many and well-connected. The roads are mostly tarred or paved and appear well-maintained.	PHOTOGRAPHS ☐ 3 roads with recognizable landmarks	
9	Power supply	What is the current and recent situation of power supply (electricity) in the settlement?	Power supply is non-existent or rarely available, with very few houses having generators as an alternative source.	Power supply is notably irregular, with a few houses using generators as an alternative source.	Power supply is largely regular, and most houses have alternative power sources such as generators and solar inverters.	PHOTOGRAPHS (w/ time stamp) ☐ Power sources	
10	Population density	What is observable about the ratio of the human population to the size of the area?	The settlement is largely densely populated, appearing to have too many people crowded in a small area.	The settlement is sparsely populated in some areas and densely populated in some other areas.	The settlement is mostly sparsely populated, with the area having a proportionately balanced number of residents.	INTERVIEWS with ☐ Local residents ☐ Photograph ☐ Voice note	
SCORING MATRIX:			☐ 10 - 15 points: Predominantly slum	☐ 16 - 24 points: Predominantly informal settlement	☐ 25 - 30 points: Predominantly formal settlement	TOTAL SCORE ➞	



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/88935481892?pwd=h3cuJ3x5LOsR58YXcEaub8ULqu5LMj.1>

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

<https://zoom.us/u/acyOjklJj4>

To be added to the AMP mailing list visit:

<https://allianceformalariaprevention.com/join-us>

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

info@allianceformalariaprevention.com

For further information please go to the AMP website:

<https://allianceformalariaprevention.com>