Nigeria’s experience with prioritization of campaign ITNs in urban areas: Process, outcomes and recommendations for future

National Malaria Elimination Program Nigeria

7th April 2025

Our Vision - a malaria-free Nigeria; Our goal – To reduce morbidity to less than 10% parasite prevalence and mortality attributable to malaria to less than 50 deaths per 100,000 live births by 2025.

Presentation Outline

- Introduction & Context for Proper Targeting of Nets
- Process for selection of wards
- Outputs
- Guidance Provided by the National Task Team
- Summary of key steps
- Lessons Learned and Challenges
- Recommendations

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Introduction: Context for Proper Targeting of Nets – 1

- The National Malaria Elimination Programme (NMEP) is rethinking the strategies and interventions that will impact the malaria burden in line with sub-national tailoring (SNT).
- One critical area is the approach to malaria transmission in the urban area given its heterogeneity, complexity and socio-economic indices as well as in the light of uptake of previous interventions and how they may have affected disease prevalence.
- Until recently (with the introduction of the malaria vaccine) donors, partners and governments in the country have focused mainly on some traditional preventive interventions. Given limited funding from all sources and the desirability of employing other control measures, it became imperative to see how available funding (from every source) could be better managed and deployed. This is in line with ensuring that interventions meet the criteria of effectiveness, efficiency and equity.
- The question arose: could insecticide-treated net (ITN) distribution in urban areas be adjusted to specifically target those who truly need them?
- This has become a starting point for the implementation of an urban malaria strategy which will help maximize resources and achieve impact.

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Introduction: Context for Proper Targeting of Nets – 2

- In 2023, a pilot project was initiated for the Kwara ITN campaign to develop a guide for re-prioritizing ITNs in urban areas, even though all the necessary nets had already been procured.
- Professor Ifeoma Ozodiegwu and her team from the University of Chicago supported the Kwara pilot with funding from the Bill and Melinda Gates Foundation (BMGF).
- They employed a classification algorithm to identify areas (three settlements in two wards) with low risk of malaria transmission in Ilorin. Community stakeholders validated the results.
- The next step involved simplifying the process and deploying the learning from the Kwara pilot to other states conducting ITN mass campaigns.
- The principle has been employed in the ITN campaigns in Gombe, Jigawa, and Ogun States in varying degrees.
- In 2025 seven States where ITN campaigns will be conducted were targeted. Tropical Health with support from Global Fund was also engaged by NMEP to help develop a decision flow chart to be used for national-level macro planning.

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Process: Criteria for Identifying Areas where ITN Distribution will not be Prioritized – 1

With support from the University of Chicago (Prof Ifeoma's team):

- Publicly available data was collated and variables were extracted for the wards in the selected states
- A composite score was generated to enable ranking wards from low to high malaria risk. Ward ranks were based on the composite scores or the estimated malaria prevalence for outputs based on a machine learning model.
- For the Kano metropolis, malaria risk was modelled using a machine learning (ML) approach in line with the above scenarios
- Different reprioritization scenarios were provided (10%, 30%, 50% and 75% of the ward area was classified as urban). The 75% and 50% scenarios were prioritized.

Process: Criteria for Identifying Areas where ITN Distribution will not be Prioritized – 2

The variables that were ranked were:

- Enhanced Vegetation Index (EVI)
- Under 5 Test Positivity Rate (TPR)
- Settlement type
- Distance to water bodies
- Flood intensity

Process: Criteria for Identifying Areas where ITN Distribution will not be Prioritized – 3

Furthermore, NMEP/SMEOR considered Under 5 Test Positivity Rate (TPR) and known/ assumed urban areas

Outputs

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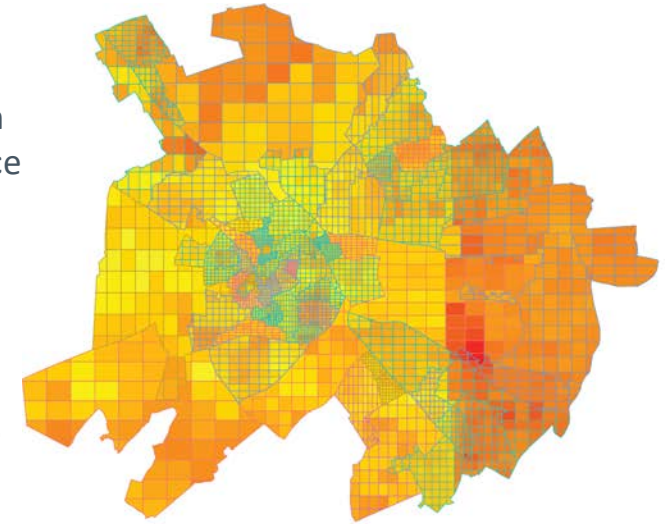
Kano metropolis

Settlement level variation in predicted malaria prevalence



Using data from our field study and remotely sensed data, we identified wards for reprioritization

Variables that went into the model

Vegetation indices
Building height
Moisture indices
Building morphology
Night-time lights

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Kano metropolis

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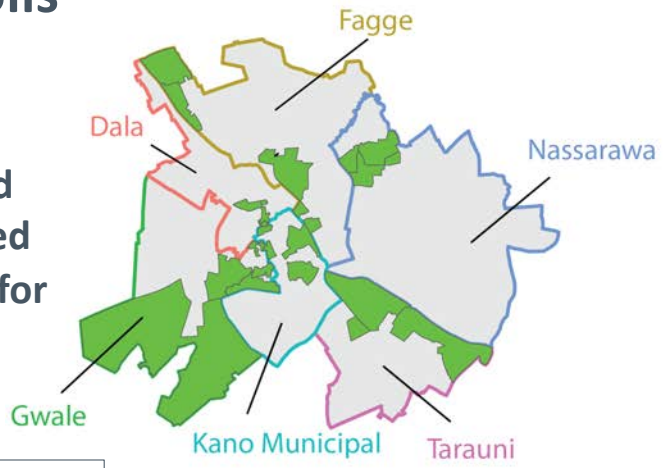
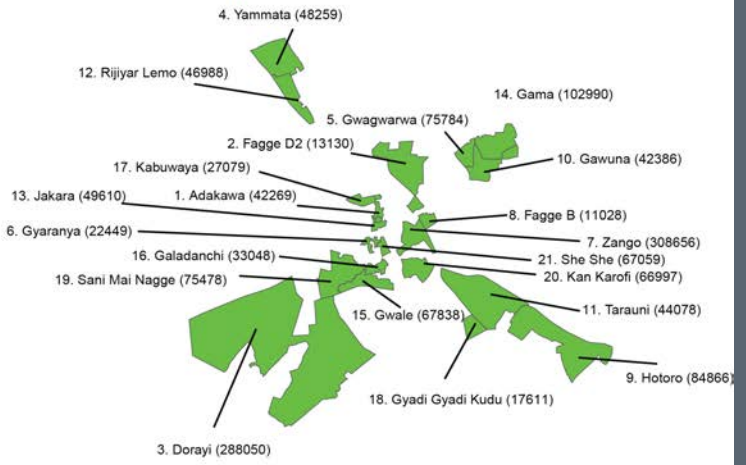
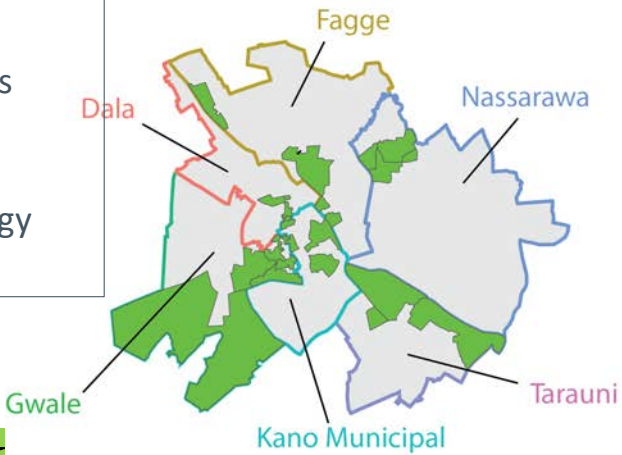
Reprioritization Scenario 3 - at least 50% of the ward is urban

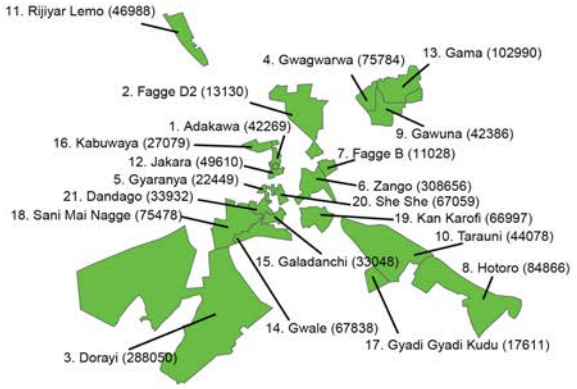


Reprioritized wards



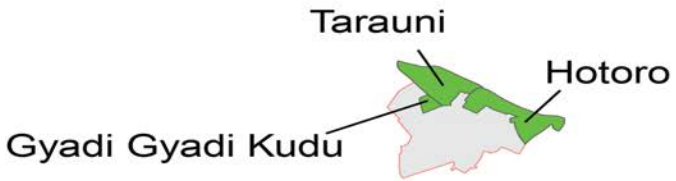
Reprioritization Scenario 4 - at least 75% of the ward is urban



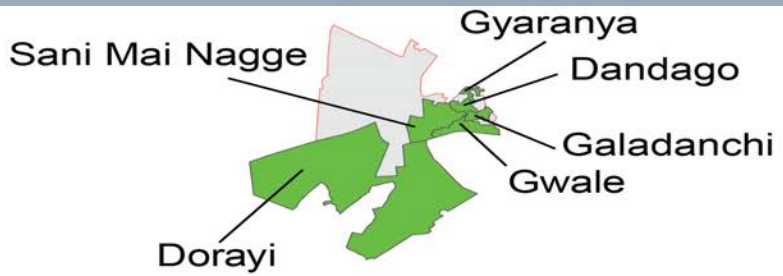


Label: ranks, ward name, ward population

Wards recommended for reprioritization by LGA in 75% urban scenario for Kano metropolis

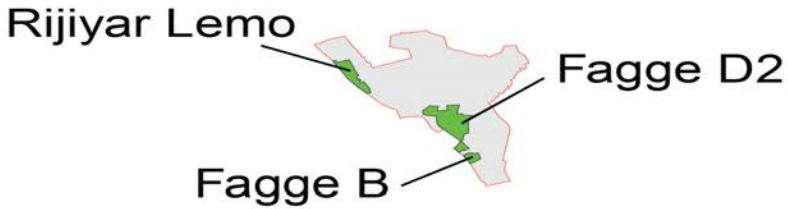


Tarauni LGA



Gwale LGA

Dala LGA



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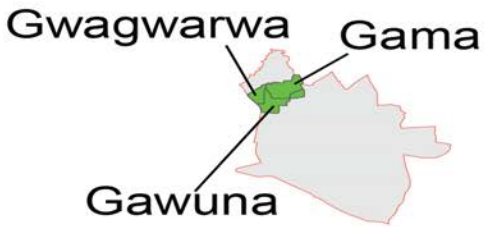
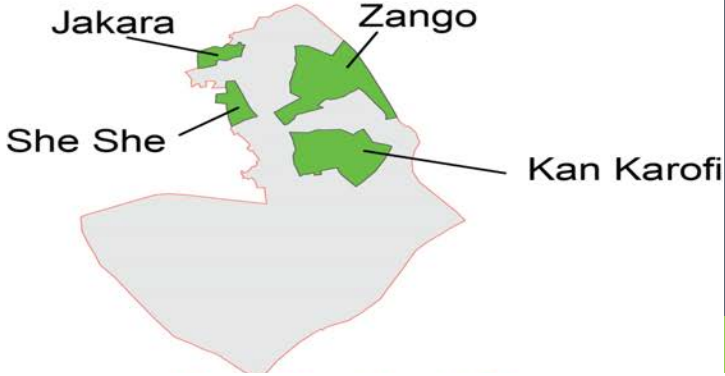
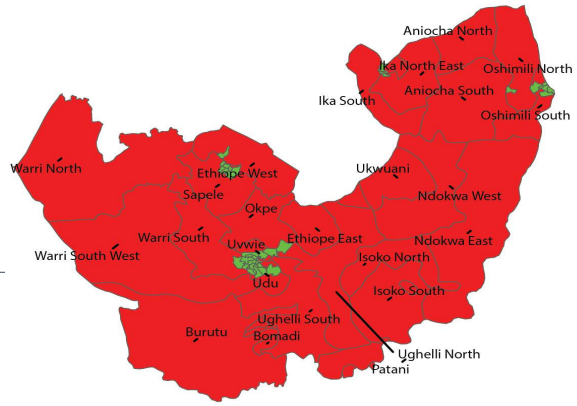
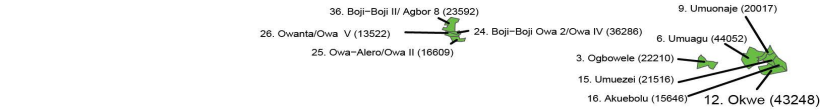


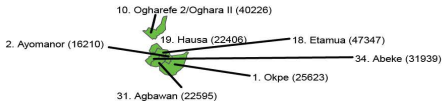


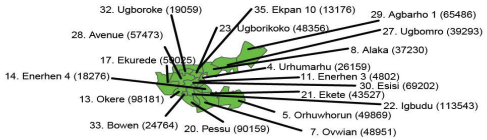
Delta state

Reprioritization Scenario 3 - at least 50% of the ward is urban







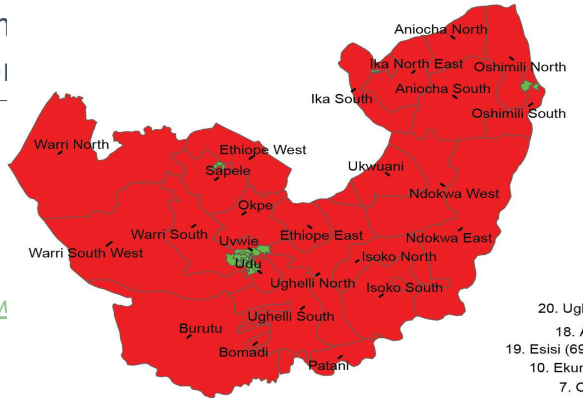


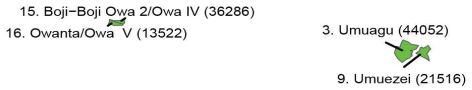
Labels

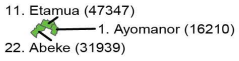
Left: LGA

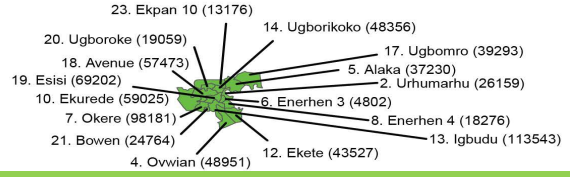
Right in green: ranks, ward nan ward populatio

Reprioritization Scenario 4 - at least 75% of the ward is urban







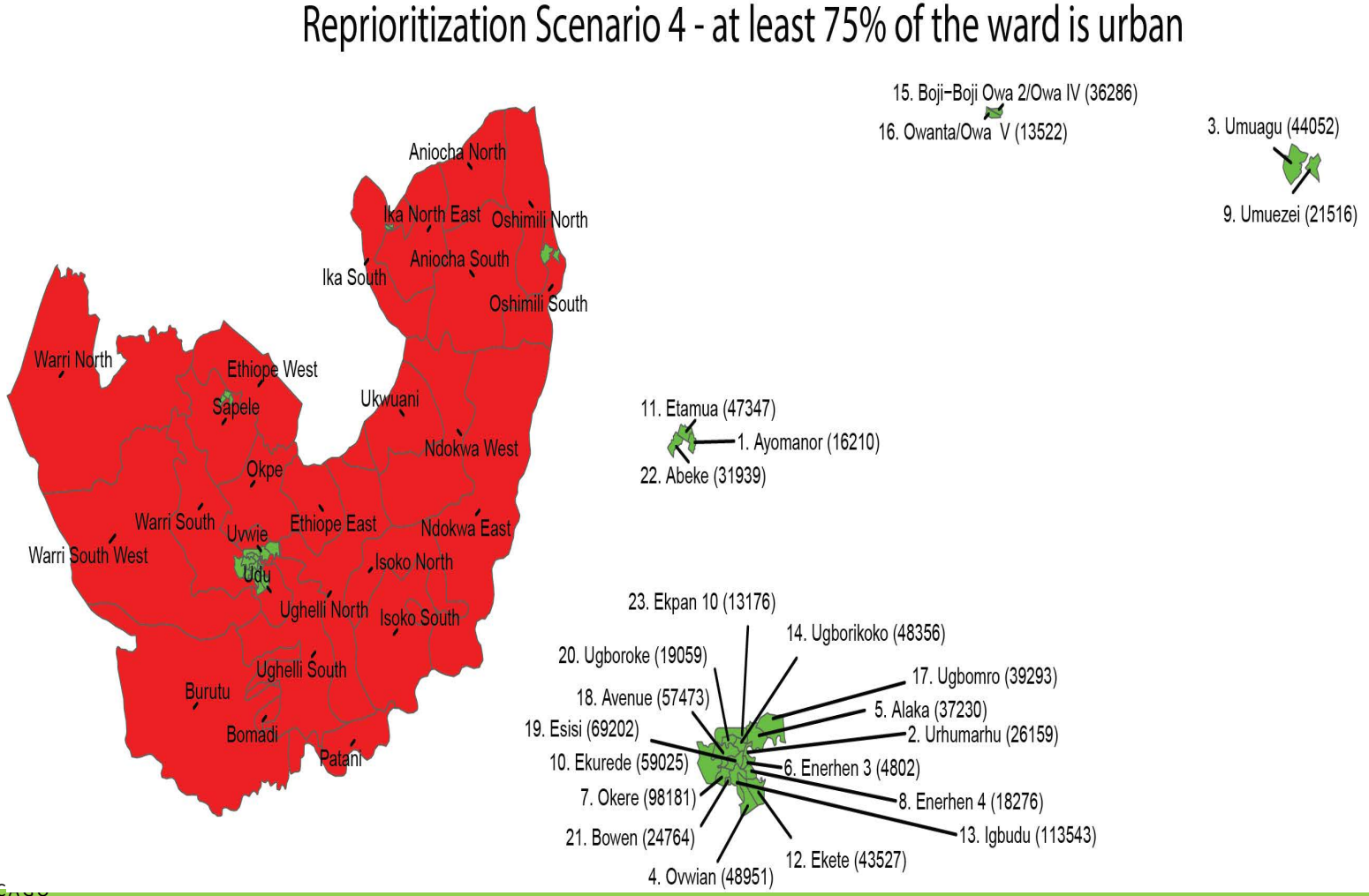


Here is the link to the list of reprioritized w

Our vision - a malaria free Nigeria; Our goal – to reduce malaria burden to pre-elimination levels and bring malaria-related mortality

Delta state

Wards recommended for reprioritization by LGA in 75% urban scenario in Delta



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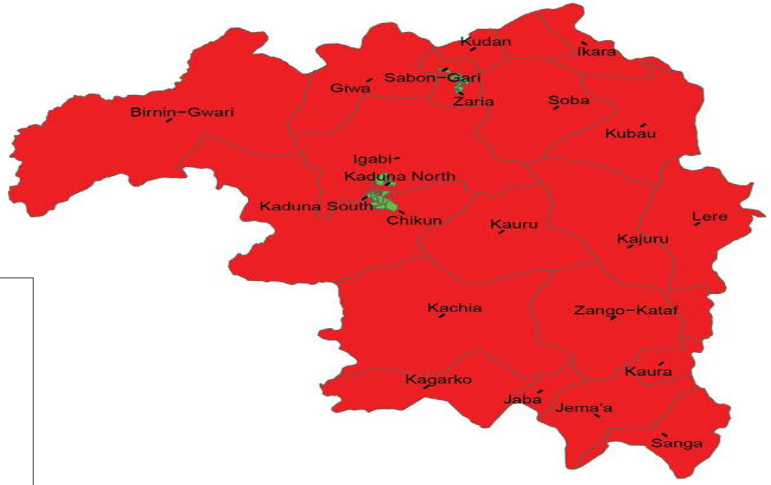
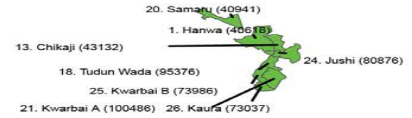
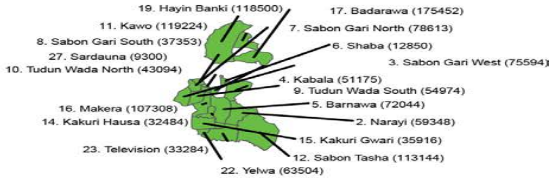
Kaduna state

Reprioritization Scenario 3 - at least 50% of the ward is urban







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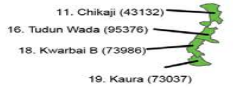

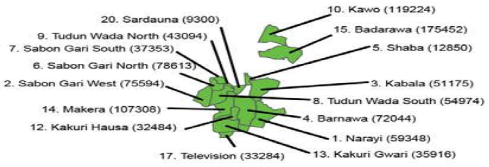

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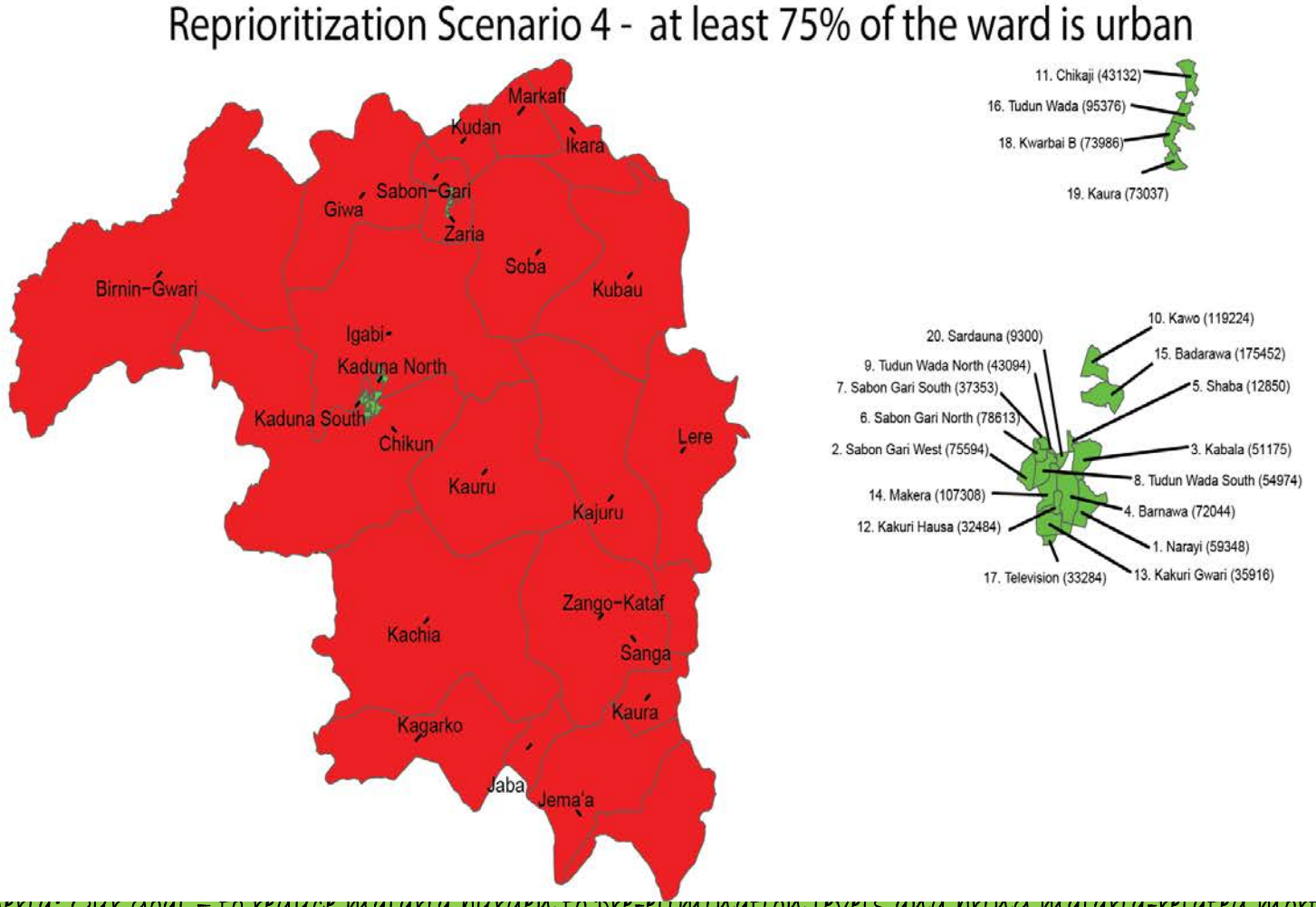
Kaduna state

Wards recommended for reprioritization by LGA in 75% urban scenario in Kaduna State



Katsina state

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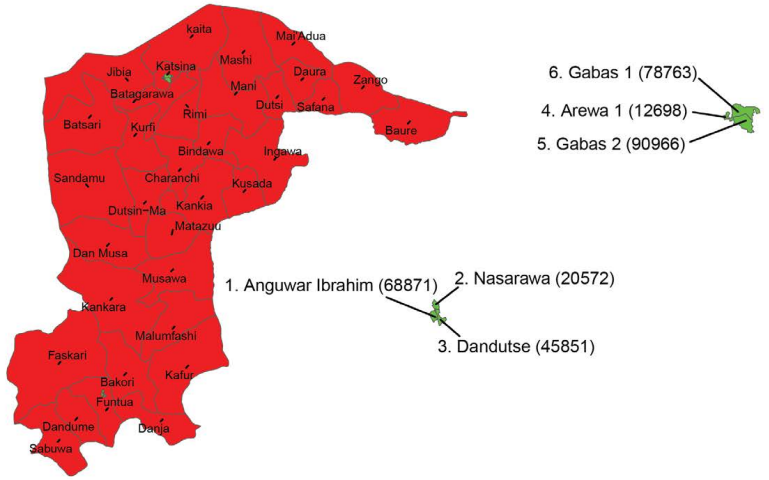
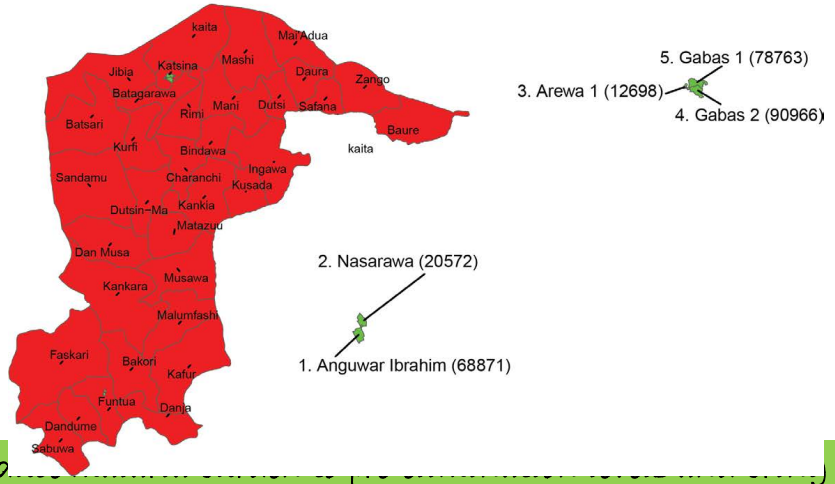


Reprioritization Scenario 4 - at least 75% of the ward is urban

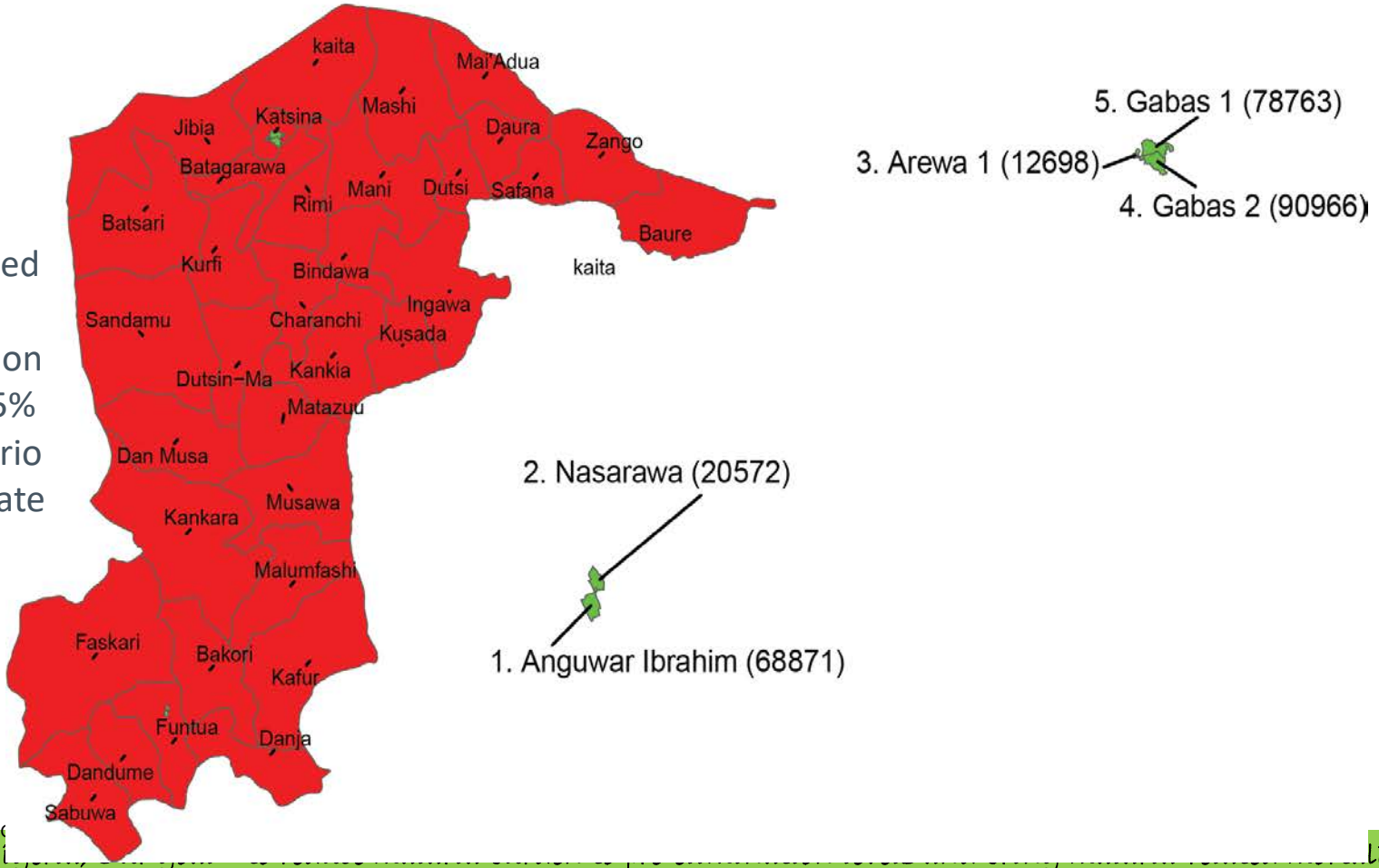


Here is the link to the list of reprioritized wards

Our vision - a malaria free Nigeria; Our goal – to re… malaria-related mortality

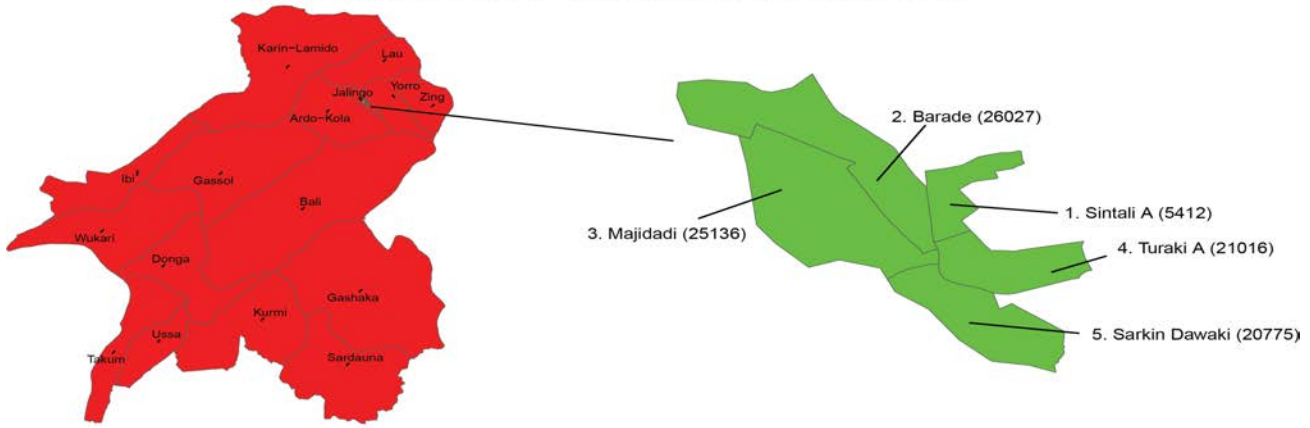
Katsina state

Wards recommended for reprioritization by LGA in 75% urban scenario in Katsina State



Taraba state

Reprioritization Scenario 3 - at least 50% of the ward is urban



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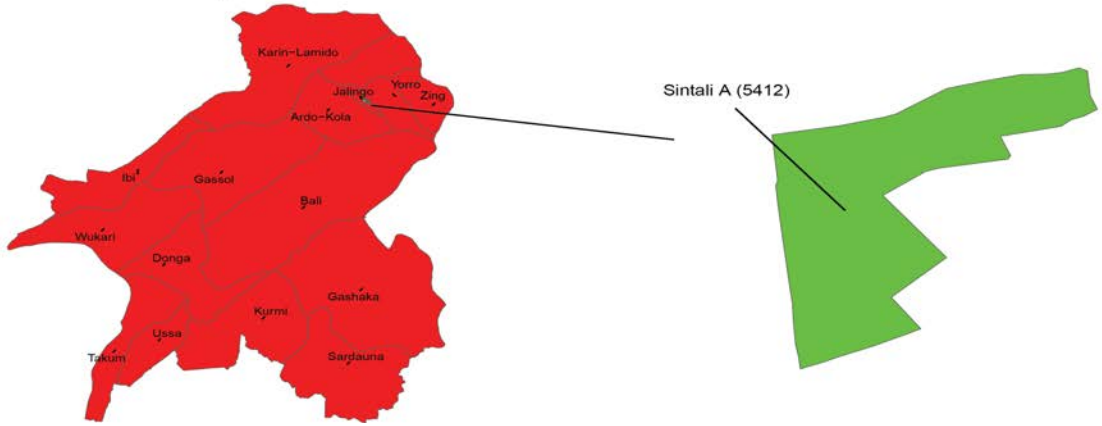

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Our Vision - a malaria free Nigeria; Our goal – to reduce malaria burden to pre-elimination levels and bring malaria-related mortality

Yobe state

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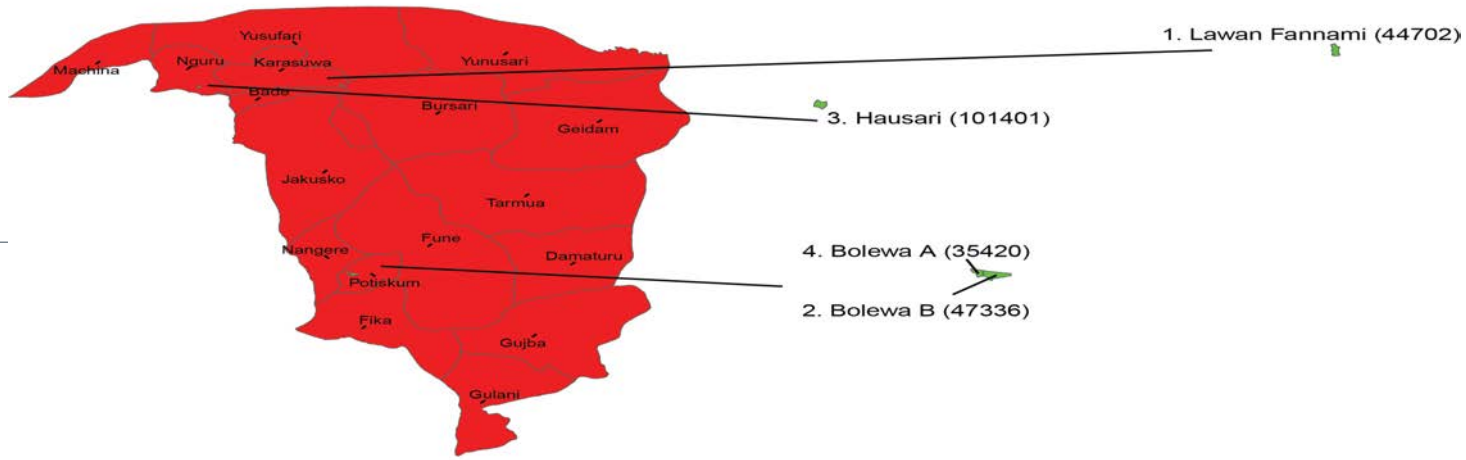

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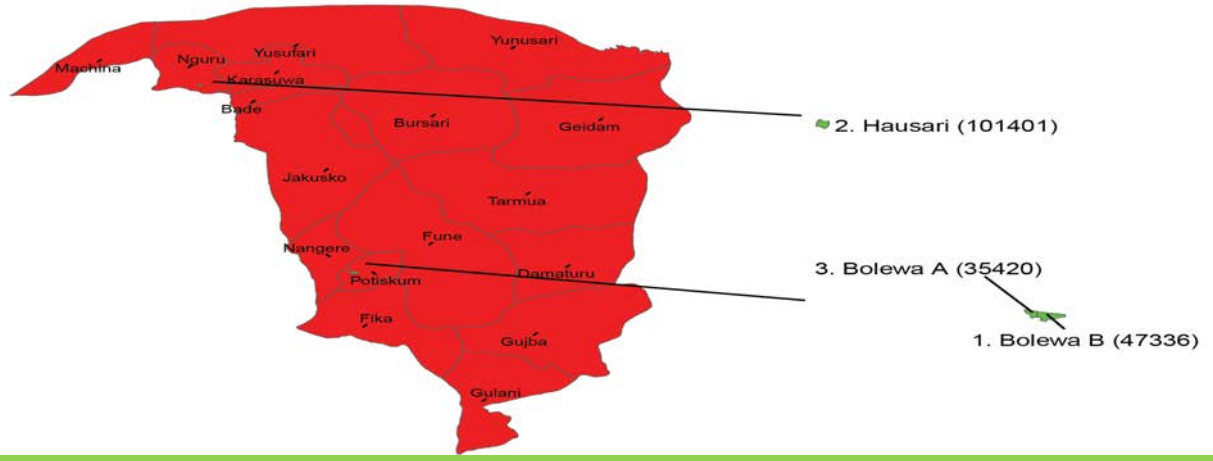

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Niger state

Labels

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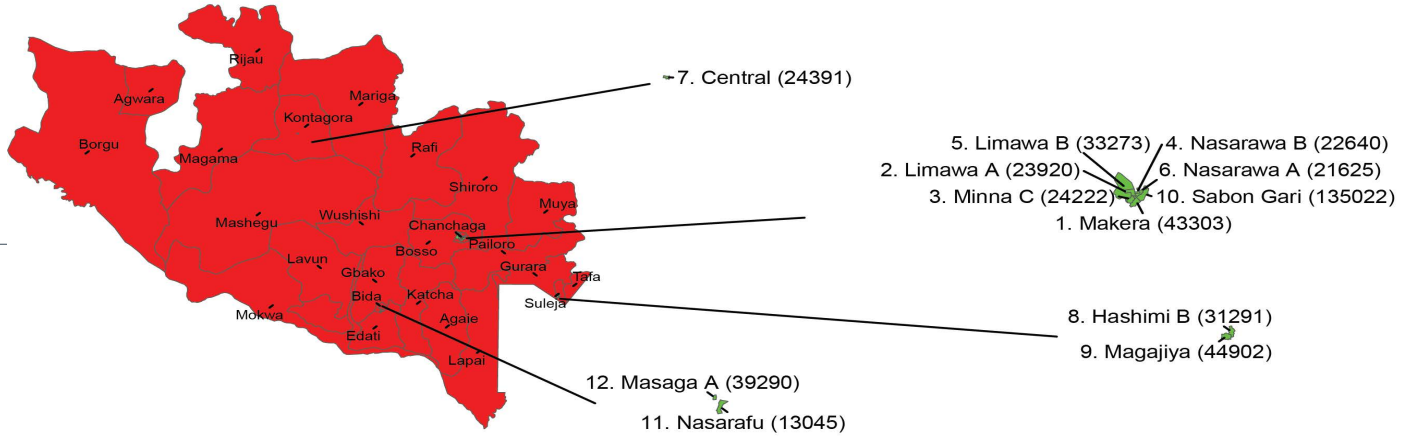
Reprioritization Scenario 3 - at least 50% of the ward is urban



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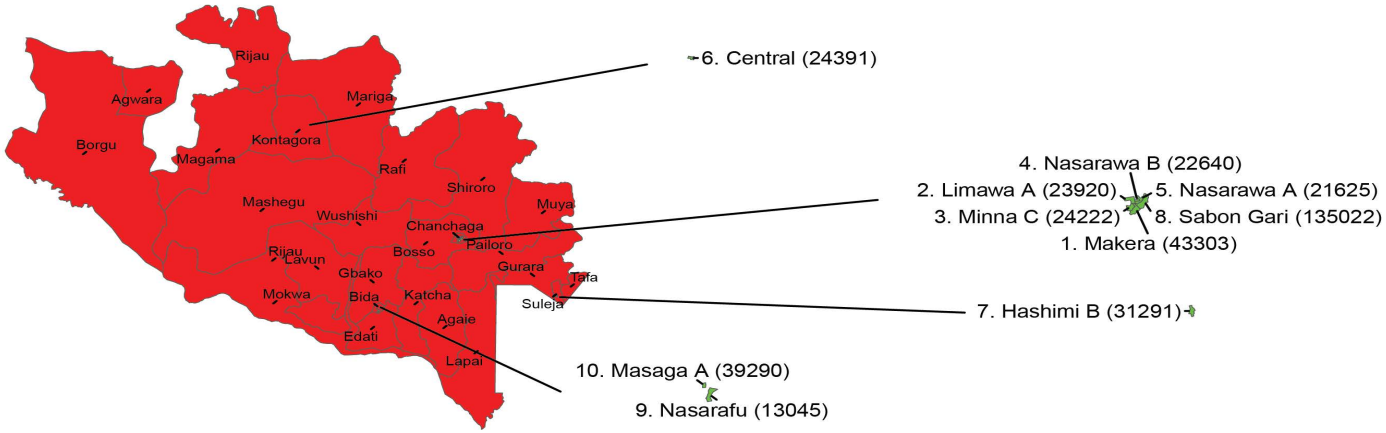

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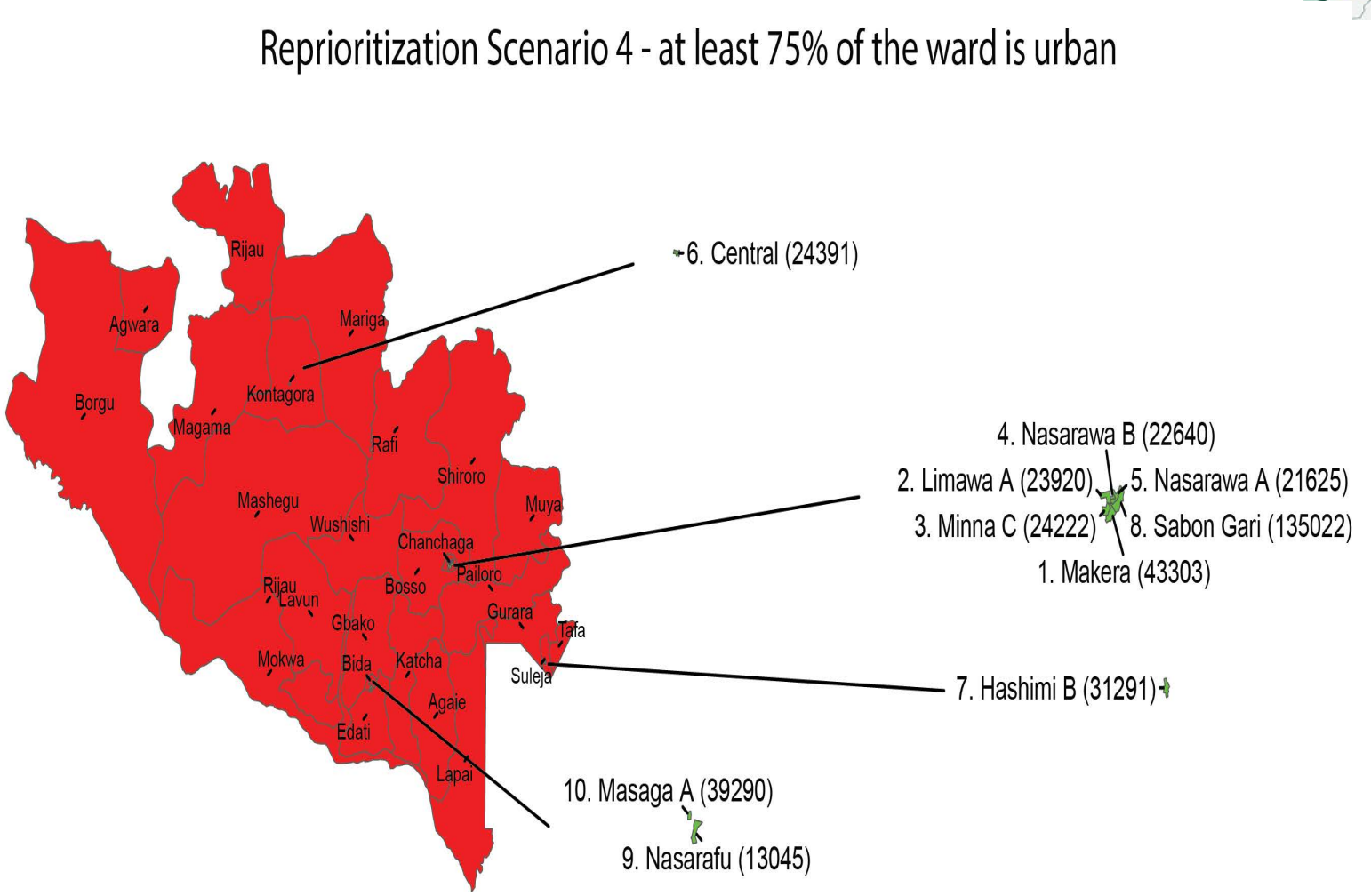
Niger state



Wards recommended for reprioritization by LGA in 75% urban scenario in Niger State

Summary of Recommended Wards with Estimated Populations by State

State	No of Recommended LGAs & Wards for Reprioritization	Total Population of Recommended Areas	Additional LGAs & Wards	Total Population of Additional Areas	Total LGAs & Wards for validation	Total Population of Areas for validation
Delta	5 (25)		11 (24)		12 (49)	
Kaduna	5 (27)	1,469,231	7 (13)	808,357	7 (40)	2,277,588
Kano	6 (27)	1,399,878	6 (14)	471,321	7 (41)	1,871,199
Katsina	2 (5)	262,207	2 (2)	91,624	3 (7)	353,830
Niger	4 (11)	369,343	4 (6)	212,854	5 (17)	582,197
Taraba	1 (2)	55,176	3 (18)	524,139	3 (20)	579,315
Yobe	2 (3)	130,544	2 (4)	117,393	4 (7)	247,937

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Guidance for Validation from the National Task Team

Review & Plan

- SMEP reviews suggested areas and checklist for validation
- Identifies urban areas for validation or inclusion
- Conducts preliminary engagement with State Policy Makers
- Plans on the best way to conduct validation

Validate

- Key stakeholders very familiar with the terrain and settlements are identified at the State or LGA level.
- Suggested wards are taken one after another and OBJECTIVELY assessed using the provided checklist. Locations as to the LGAs they fall are confirmed. Estimated populations are provided
- Stakeholders reach a consensus on low-risk areas that will have other vector-control interventions

Review & Share

- SMEP reviews outputs from the validation process
- A state-level stakeholders' meeting is convened where final outputs are discussed and agreed on.
- The state shares outputs with data collected using the checklist with NMEP. Minutes of the stakeholders' meeting are to be shared as well.

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Summary of Key Steps – Prior to Microplanning

- The IVM and SMEOR branch through the Task Team on Reprioritization generates a list of areas for possible reprioritization per State.
- The list is shared by the IVM branch with States with the implementing partners in copy for validation using/adapting a standardized checklist from SMEOR. The validation includes identifying and adding more wards that are urbanized and with relatively low TPR.
- Engagement meetings are held by NMEP with individual States to review the list and provide orientation to SMEP officers with implementing partners on how to conduct validation.
- Implementing Partner(s) support(s) the State to conduct the validation, ensuring some rigour is introduced into the process by using existing structures.
- The validation outcome is shared with the Task Team for review and alignment. Any issues will be resolved in consultation with the State and supporting implementing partner (IP). State signs off on the validated list.

Summary of Key Steps – After Microplanning

- The population generated from microplanning activity (after removing areas for reprioritization) is triangulated with several available nets by the Implementing Partner with oversight from IVM/NMEP. Where available nets are inadequate or in excess, a stakeholders' meeting is convened by the IVM branch to agree on what should be done.
- Scenarios to be considered if available nets are insufficient for the target population are as follows (in line with a decision-making flowchart for ITN prioritization in urban areas which was developed with support from Tropical Health):
  - Explore other sources of nets including requesting the State Government to procure the balance (if there is sufficient time before the campaign) or re-channelling surplus nets from other States.
  - Seek additional areas to be excluded during net distribution. Note that this is a response to an inadequacy of nets available, rather than part of the urban malaria strategy. The key elements to be considered in identifying such areas are formal settlements and low/decreasing under 5 TPR.
  - Where additional areas have been identified for reprioritization and there is still a shortage of nets capping can be done after household mobilisation and during the distribution of ITNs.
  - Do a State-level capping. The ideal would be to cap by LGA and have different caps for different LGAs based on the level of risk. However, the current technology being used in ITN campaigns is unable to do this.

The State need to have verified working population harmonized for the use of health care intervention in the State

Challenges

- There is a fear that reprioritizing a ward may lead to the rejection of other health interventions.
- Anticipated reaction of non-ITN targeted wards - which could be, theft, violence and rejection of other health interventions. This was experienced in some states last year.
- Getting accurate population figures is always a challenge, due to outdated population census data and different health interventions having different population figures.

Lessons Learned

- The implementing partner's support for the validation process and a clear understanding of the reason for the strategy ensured hitch-free acceptance.
- Bias is always introduced in the validation when LGA RBMs are left on their own – no one wants to be instrumental in 'depriving' any area of ITNs.
- The State team was willing to proceed with the suggested areas but is reticent as they must wait for the relevant policymakers to approve.
- ITN prioritization planning when started and integrated early and as fully as possible into existing campaign processes has shown better success and acceptance
- Early engagement of stakeholders at all levels conveying the rationale for urban ITN prioritization was found to be very vital.
- Strong engagement at the community levels with clear SBC messaging helped with acceptance and compliance at all levels and managing negative community responses critical to ensure the safety and smooth deployment of the campaign and mitigate rumours

Recommendations

- Start the process early – if possible, a year before the campaigns and let it inform ITNs to be procured for each State.
- Stakeholders' engagement at various levels is important. Several meetings may be necessary for the same group of persons. The engagement process is to start early.
- Support the development/adaptation of appropriate messaging for the wards where nets will not be distributed.
- Conduct strong monitoring and surveillance in the reprioritized areas.
- The State need to have verified working population harmonized for the use of all health care interventions in the State
- There is a need to plan and implement other appropriate vector control interventions in non-ITN targeted wards. This is advisable to be conducted before or during implementation.

THANK YOU