Panel Discussion Vector Control in Nigeria

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Background

- The first of strategic objective of Nigeria Malaria Strategic Plan (2014-2020) , is to provide at least 80% of targeted population with appropriate preventive measures by 2020.
- The thrust of the strategies under this objective is the provision of proven high impact vector control interventions towards universal insecticidal coverage to the entire population.

Core interventions

- Long-Lasting Insecticidal Nets (LLINs) : >80% in a target community.
- Indoor Residual Spraying

Complementary interventions

- Larval control
- Environmental management

Personal protection

- mosquito nets, Repellents, protective clothing at night

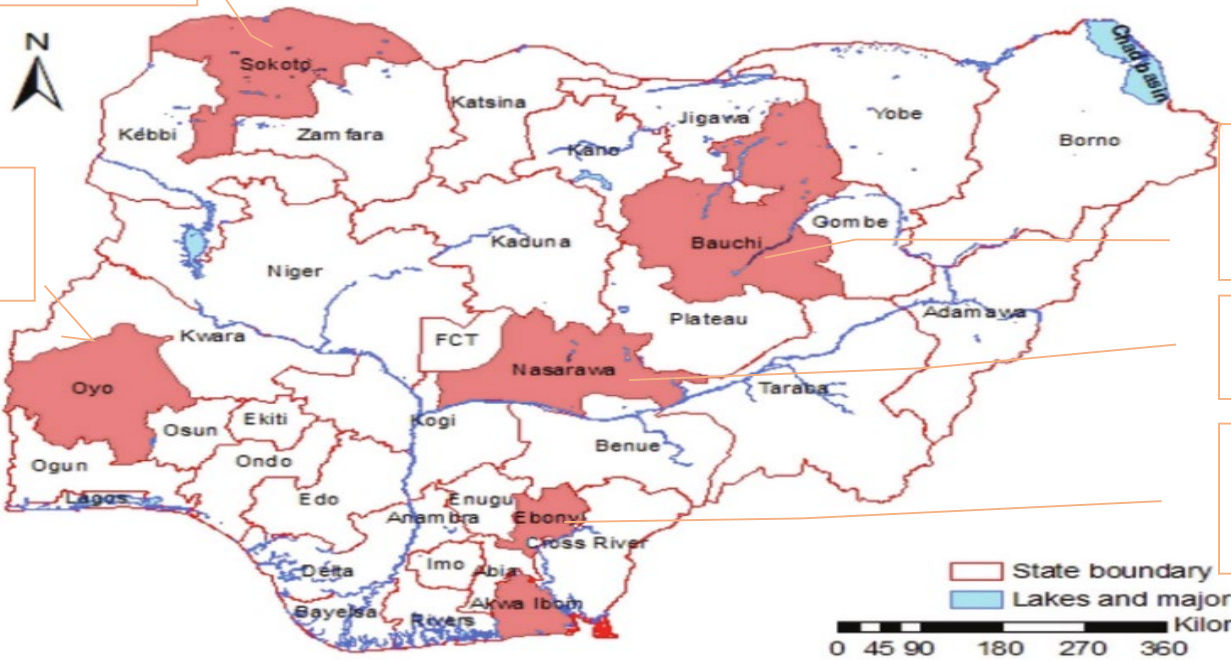
Background

- Entomological surveillance of malaria vectors is:
  - important and essential aspects of malaria vector control
  - useful for the monitoring of potential vectors, their resistance and the role they could play in disease transmission.
- Information collected from Entomological Surveillance
  - assist in the understanding of vector behaviour & biology
  - and the efficacy and effectiveness of vector control measures
- NMEP and Partners, including the academia and research community have been in collaboration for conducting vector surveillance and insecticide resistance studies.
- Nigeria institutionalized vector surveillance and Insecticide Resistance Monitoring through the establishment of functional surveillance sentinel sites across the country since 2014 with funding support from the Government of Nigeria (FGN and Lagos State), USAID PMI, DOD/NAMRU and Global Fund

Vector surveillance

- Historically, thirty Anopheles species have been reported in Nigeria
- Current data emanating from longitudinal surveillance sites across the five geo-ecological zones in Nigeria have recorded eleven Anopheline species
- Ten of these have been implicated in malaria transmission
- *An. coluzzii, An. gambiae, An. arabiensis and An. funestus* are the predominant vectors across all ecozones of the country.
- The composition of each of these vector species vary across the states and ecological zones in Nigeria
- Both *An. gambiae* and *An. funestus* observed in most of the ecozones mainly rest indoors and are highly anthropophagic (human biters)

Vector Map showing distribution of Malaria vectors across the ecological zones of Nigeria in 2017



An. gambiae s.l.
An. pharoensis
An. funestus

An. gambiae s.l.
An. longipalpis
An. pretoriensis

An. gambiae s.l. *An. malculipalpis*
An. funestus *An. moucheti*
An. coustani *An. pretoriensis*
An. nili *An. squamosus*
An. rufipes *An. ziemani*

An. gambiae s.l. *An. malculipalpis*
An. funestus *An. pharoensis*
An. coustani *An. nili*

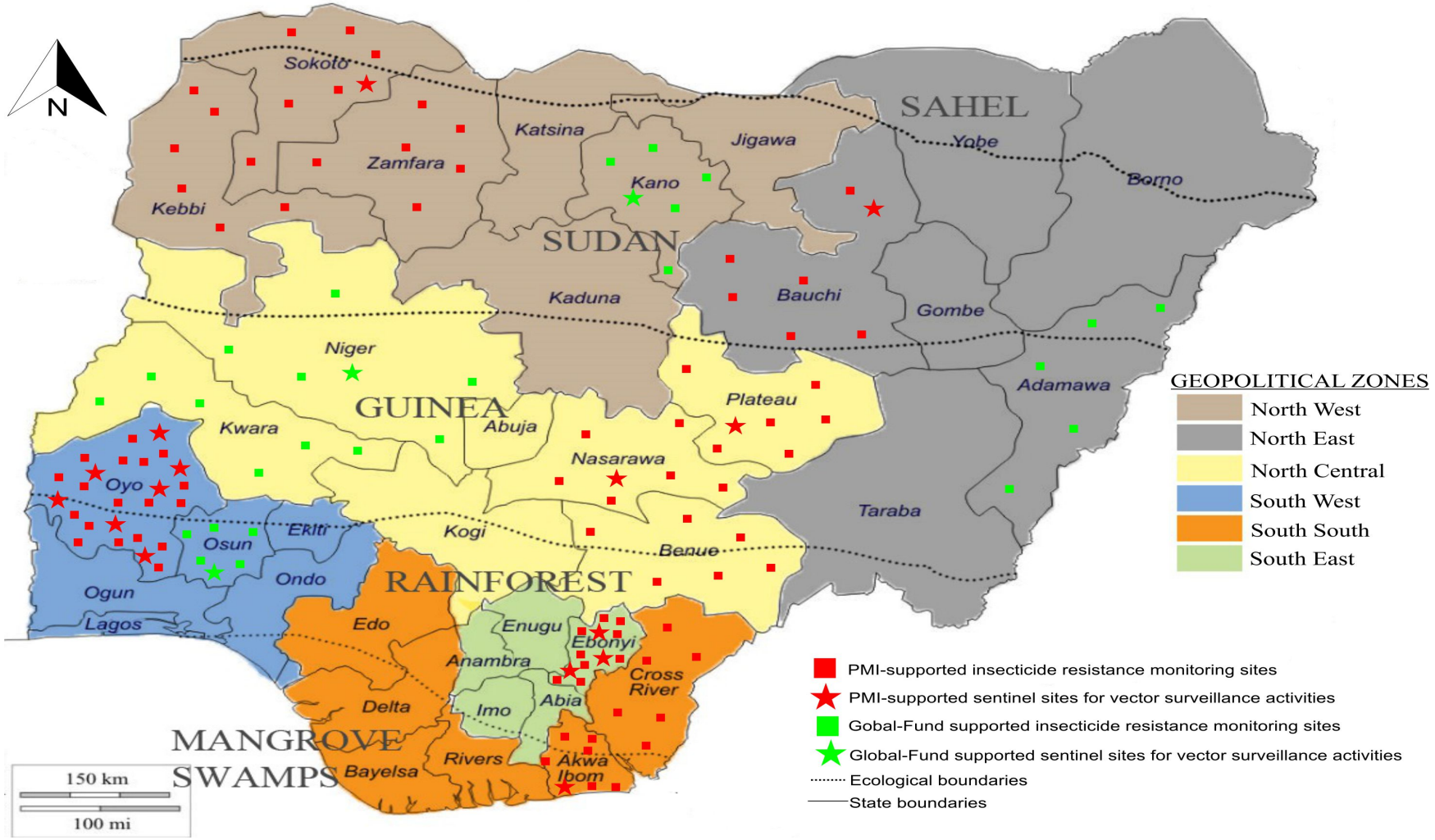
An. gambiae s.l. *An. malculipalpis*
An. funestus *An. moucheti*
An. coustani *An. nili*
An. pharoensis *An. rufipes*
An. squamosus

An. gambiae s.l.
An. moucheti
An. funestus
An. coustani
An. obscurus

Coordination of Insecticide Resistance Monitoring

- Insecticide resistance monitoring is currently coordinated by the NMEP working with the Nigerian Institute for Medical Research as the technical instrument.
- 16 active sentinel sites are currently in the country across the 5 eco-geological zones of the country all supervised by PIs engaged from universities working with both the State governments and a team of entomology technicians

Distribution of sentinel sites in Nigeria



Principle of Universal Coverage

- Farmers are not given a special attention at this time in the country considering that the prevalence of malaria is still high. They are therefore placed together with the general population in the spirit of universal coverage with emphasis on leaving no one behind – during mass campaigns for the distribution of LLINs, everyone is factored into the programme irrespective of social status or location

Categorization of Transmission Sites

- Transmission sites have note been categorized in terms of specialized interventions as the focus for the country now is to bring prevalence down to pre-elimination status
- Transmission is still ongoing across the country in the southern part through out the year with seasonal variations in the northern areas often experiencing peaks during increased rainfall
- The country therefore employs a combination of preventive measures to tackle malaria control including Seasonal Malaria Chemo-prevention (SMC) as well as previously outlined vector control measures

Stratification of the country

- Stratification exercise was recently conducted by the NMEP to determine the best fit interventions for the country considering that the various states are at differently levels of progress in malaria elimination.
- An intervention mix was developed for the various states using a set of criteria as developed by the WHO

Intervention type	Targeting criteria
Case management – formal health services	All districts, no need for stratification. However, analysis of accessibility will help inform scale of iCCM interventions
Indoor residual spraying	• Areas with the highest prevalence, incidence and under-five mortality rates
Pyrethroid-only nets	• Areas without IRS • Districts with >1% $PfPR_{2-10}$ in 2000 • Exclude districts with IRS • Microstratification required in districts covering cities with >500k people
Pyrethroid-PBO nets	• If IRS not implemented • WHO recommends areas with intermediate pyrethroid resistance with MFO involvement. If countries do not have data on MFO, then in areas of intermediate resistance they can aim for those with **the highest combined risks of prevalence, incidence and mortality**
Seasonal malaria chemoprevention (SMC)	• Areas where $PfPR_{2-10}$ >5% in 2018 • Districts where >60% of rainfall occurs within 4 consecutive months.

Intervention type	Targeting criteria
Intermittent preventive treatment during pregnancy (IPTp)	All districts. No need for stratification. However, analysis of ANC and IPTp coverage will help inform efficient delivery of services
Intermittent preventive treatment in infants (IPTi)	• Districts NOT targeted by SMC with >10 $PfPR_{2-10}$ in 2018 Note: if scale up is in phases, areas with high burden but also with reasonably high access to health facilities (i.e. high EPI usage) can be considered in Phase 1 to maximize coverage, as well areas that report high rates of severe malaria admissions.
Integrated Community Case management (iCCM)	• Districts with >5% $PfPR_{2-10}$ in 2018 with low access to care Note: if iCCM scale up nationwide is not possible, poor access (>5km to nearest health facility) and high U5 mortality rate (>75 deaths per 1000 livebirths) can be considered for initial scale up to maximize on impact. *Pending data on number of CHWs per LGA

Intervention Mixes

- Intervention mixes that could be implemented in States with seasonality of three to four peaks and four peaks excluding IRS
  - CM + IPTp + LLINs + IPTi
  - CM + IPTp + LLINs + SMC
  - CM + IPTp + PBO-LLINs + IPTi
  - CM + IPTp + PBO-LLINs + SMC
  - CM + IPTp + Urban LLINs
  - CM + IPTp + Urban LLINs + IPTi
  - CM + IPTp + Urban LLINs + SMC

Intervention mixes contd.

- Intervention mixes that could be implemented in States with seasonality of three to four, and four peaks including IRS
  - CM + IPTp + LLINs + IPTi
  - CM + IPTp + LLINs + SMC
  - CM + IPTp + Urban LLINs
  - CM + IPTp + Urban LLINs + IPTi
  - CM + IPTp + Urban LLINs + SMC
  - CM + IPTp + IRS + IPTi
  - CM + IPTp + IRS + IPTi + SMC

Challenges

- Shortage of vector sentinel sites (presently only 16 with plans to scale up to 37 for complete coverage of the country)
- Inability to run mass LLIN campaign exercises across all the states in the country (World Bank IMPACT Project – innovative financing option is intended to cover uncovered areas)
- Lack of resources to take up other vector control options in addition to LLINs distribution (IRS)
- Increasing insecticide resistance across the country