Use of strategic information to drive impact

Stratification and intervention mixes

WHO Malaria Technical Support to Nigeria
NMEP

Global Malaria Programme

World Health Organization
National strategic plan development and implementation

National Strategic Plans

Objectives

Strategy

Who? population at risk
Why? transmission determinants
What? interventions
When? seasonality, age
Where? place
How? delivery

1. Impact evaluation
2. Stratification & Intervention mixes
3. Impact predictions
4. NSP Costing
5. Prioritization

How much is available?

How much does it cost?

Funds Needed

How can I achieve the maximum level of impact with the resources available?

DATA
Stratification – a multifactorial visualization approach to inform decisions

**Impact Outcome**

- Transmission
  - Parasite prevalence
  - Entomological inoculation rate (EIR)
- Mild disease
  - Annual parasite incidence (API)
- Severe disease
  - Severe disease incidence
- Death
  - All cause US and malaria mortality rates

**Primary Indicators**

- Vector control and chemoprevention
  - LLINs distributions, coverage, access and use
  - IRS campaigns, coverage
  - Insecticide resistance
  - SMC distribution, coverage
  - ANC and IPTp coverage, SP stockouts
  - Data on other prevention interventions

- Health care access and surveillance
  - Distribution of HF by type / workforce
  - ICCM / CHW coverage
  - Treatment seeking rates
  - RDT distributions, coverage, stock-outs
  - Testing rates in public / private sectors
  - ACT / Second line treatment distributions, efficacy, stock-outs
  - Treatment rates in the public / private sectors
  - Surveillance coverage, completeness and quality

- Access to quality care against severe disease
  - Distribution of facilities with inpatient / blood transfusion services
  - Access to treatment for severe malaria
  - Severe disease management capacity

**Contextual factors**

- **Socio-economical:** urbanization, education, poverty, out of pocket expenditure on health, agricultural activities
- **Populational:** age-structure, population count and density, population displacements (refugees, IDPs, etc), migration / travelling

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**Global Malaria Programme**

= Some level of association

**World Health Organization**
Epidemiological stratification

- Incidence
- Prevalence
- All-cause under-five mortality
Entomological stratification
Entomology and pyrethroid resistance

An. Arabiensis
An. Gambiae
An. Funestus
Pyrethroid resistance

- Sites not sufficiently representative
- Mostly bioassay data
- Results vary over short distance and time making interpretation difficult
- Not linked to carefully collected epidemiological data
Ecological stratification
Ecological factors

- Altitude and topography
- Rainfall distribution (amount and seasonality)
- Temperature (min, max, night, day)
- Humidity (moisture levels, vegetation)
- Waterbodies (potential breeding sites)
- Land cover and land use (urbanization, irrigation, infrastructure development etc)
- Connectivity (virtual and physical)
Urban areas with >1 million population in 2018

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Lagos
Population = approx. 20 million
Health system stratification
Access to health services

- Quality
- Affordability
- Private sector

Global Malaria Programme

World Health Organization
Intervention targeting
### 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.
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| 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 ($>5\text{km}$ 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                  |
Vector control targeting – past LLIN distributions

2016

2017

2018

2019

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Vector control targeting – LLINs where IRS is not planned

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Microstratification in urban areas using routing HF-level data and urban/peri-urban mapping

NOTE: GPS coordinates required
Vector control targeting – PBO LLINs

Microstratification in urban areas using routing HF-level data and urban/peri-urban mapping

NOTE: GPS coordinates required
Vector control targeting – PBO LLINs

[Map of Nigeria showing different zones and intervention levels]

Intervention:
- No PBO nets
- PBO nets

Nigeria Eco Zones:
- Equatorial Forest
- Guinea Savannah
- Mangrove
- Sahel
- Sudan Savannah

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World Health Organization
Microstratification in urban areas using routing HF-level data and urban/peri-urban mapping

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Urban malaria control

- 2,063,642 confirmed from 52,207 health facilities
- 30% are among children under 5, 3% among pregnant women

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Identify areas of highest EPI coverage to further target IPTi to areas where it will have the highest impact.

*NOTE: EPI coverage commonly >100%
• PfPR > 5%
• > 20% of the population living outside of a 5km radius

Pending on CHWs density data per LGA
*NOTE: Not included in the intervention mix analysis
Intervention mixes
Intervention mix – excluding IRS

Seasonality (3 and 4 peaks)

Seasonality (4 peaks)
Intervention mix – including IRS

Seasonality (3 and 4 peaks)

Seasonality (4 peaks)
Next steps

1. Finalize consensus of intervention mixes
2. Finalize model calibration
3. Impact assessments of the intervention mixes
4. Costing of plan
5. Prioritization