ZANZIBAR (URT)
IRS for Malaria Elimination

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Background

• Malaria situation in ZnZ changed substantially over the last few years:
  – Malaria Indicator Survey (MIS 2010), shows malaria prevalence is less than 0.07%.
  – While health facility malaria test positivity rate has been reduced to unprecedented low levels (<1%)

• Dramatic decline can be attributed to intense control measures including IRS, which has had a significant impact over a short time

• Till now, 6 rounds of IRS conducted annually, with PMI support, spraying on average 200,000 house and protecting over 1.2 million people per round
IRS strategic design for Zanzibar

Prerequisites to shift from blanket to targeted spray:

• Universal usage of LLIN reached and maintained (>80%)
• Effective Malaria Surveillance in place
• Outbreak control, preparedness and response established
Shifting from Blanket to Target spray

• After 6 rounds, broad consensus to move from blanket to target spraying—reflecting ZnZ evolution from control to pre-elimination stage

• However transition no easy task:
  – Define target spraying
  – Ensure other factors are in place to move from blanket to target spraying (e.g. LLIN universal coverage)
  – Set criteria for spray eligibility
Factors to be considered

Following factors considered

1. Operational
2. Insecticide Duration
3. Malaria transmission risk
4. Epidemiological
5. Costs and available resources
6. Malaria Control Coverage
7. Pyrethroid resistance
8. Rainfall
9. Entomological
10. Alkalinity
11. BCC

• Around 220,000 eligible HH in Zanzibar

• Now, available resource limits spray to:
  – 135,000-150,000
  – Propose areas for inclusion and exclusion based on a combination of criteria

• Households that will be excluded:
  – 70,000-85,000 (around 33% of the population excluded)
  – BCC guidelines should be developed for those excluded
Recommendation

• By going towards target spraying it is important to
  – Where to spray? Determined by inclusion and exclusion criteria
  – When to spray? Depend on seasonality and duration of insecticide
  – Which insecticide? Rotation
  – How? Frequency of spray
Inclusion and Exclusion Criteria

Inclusion

• Malaria morbidity
  – Give consideration to districts (and sub-districts) according to evidence of sustained or residual transmission
  – Identified hotspots
  – History of epidemics

Exclusion

• Based on low case load and malaria transmission risk
  – related to setting exclude urban areas

• Malaria Control Coverage
  – Other vector control initiatives can be taken into consideration (LLIN, LSM) for areas to be excluded
Inclusion Criteria: Malaria Morbidity

<table>
<thead>
<tr>
<th>District</th>
<th>2011 Positive Cases</th>
<th>Population</th>
<th>rate/10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>805</td>
<td>65,372</td>
<td>123</td>
</tr>
<tr>
<td>South</td>
<td>446</td>
<td>39,082</td>
<td>114</td>
</tr>
<tr>
<td>North B</td>
<td>275</td>
<td>52,627</td>
<td>52</td>
</tr>
<tr>
<td>Micheweni</td>
<td>326</td>
<td>101,741</td>
<td>32</td>
</tr>
<tr>
<td>West</td>
<td>672</td>
<td>243,772</td>
<td>28</td>
</tr>
<tr>
<td>Mkoani</td>
<td>198</td>
<td>103,736</td>
<td>19</td>
</tr>
<tr>
<td>North A</td>
<td>160</td>
<td>95,714</td>
<td>17</td>
</tr>
<tr>
<td>Chakechake</td>
<td>148</td>
<td>103,374</td>
<td>14</td>
</tr>
<tr>
<td>Urban</td>
<td>167</td>
<td>188,953</td>
<td>9</td>
</tr>
<tr>
<td>Wete</td>
<td>64</td>
<td>111,229</td>
<td>6</td>
</tr>
</tbody>
</table>

- Cases and Rate indicates high priority districts such as Central and South
- Areas within Districts contribute to overall case load Urban and Wete low morbidity
Malaria Rate/10,000 Population (2011 MEEDS)
Exclusion Criteria: Malaria Transmission risk and other IMV

- Exclude Urban areas (Urban West districts) based on low cases (inclusion criteria for LSM instead)
- Stratified mixed districts (West), with high priority areas sprayed while proportion of urbanized areas excluded
- Further stratification needed to get a urbanized areas for some other districts (Wete, Chakechake)
Settings
Integrated Malaria Vector Management
# Inclusion Criteria: Seasonality

<table>
<thead>
<tr>
<th>District</th>
<th>Jan-Apr</th>
<th>May-Aug</th>
<th>Sept-Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chakechake</td>
<td>5%</td>
<td>72%</td>
<td>23%</td>
</tr>
<tr>
<td>Micheweni</td>
<td>7%</td>
<td>80%</td>
<td>13%</td>
</tr>
<tr>
<td>Mkoani</td>
<td>6%</td>
<td>81%</td>
<td>13%</td>
</tr>
<tr>
<td>Wete</td>
<td>11%</td>
<td>84%</td>
<td>5%</td>
</tr>
<tr>
<td>Central</td>
<td>10%</td>
<td>80%</td>
<td>10%</td>
</tr>
<tr>
<td>North A</td>
<td>9%</td>
<td>86%</td>
<td>5%</td>
</tr>
<tr>
<td>North B</td>
<td>13%</td>
<td>82%</td>
<td>5%</td>
</tr>
<tr>
<td>South</td>
<td>10%</td>
<td>77%</td>
<td>13%</td>
</tr>
<tr>
<td>Urban</td>
<td>16%</td>
<td>65%</td>
<td>20%</td>
</tr>
<tr>
<td>West</td>
<td>8%</td>
<td>84%</td>
<td>8%</td>
</tr>
</tbody>
</table>

- High proportion of cases occurs between May Aug (80% of cases in 8 weeks)
- Target Spraying should prevent seasonal transmission
Seasonality between Jan-Dec (2011 MEEDS)
Seasonality between Jan-Dec (2011 MEEDS)

Jan-Apr  May-Aug  Sept-Dec
Transmission intensity

- High and sustained transmission in a few hotspots
  - Half of cases reported in 10% of Facilities
  - 3/4 of cases reported in ¼ of HFs

- Hotspots eligible for multiple spray
  - Spray period based on residual effect of insecticide used

<table>
<thead>
<tr>
<th># cases</th>
<th>Cum Prop cases</th>
<th># of HFs</th>
<th>proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>771</td>
<td>up to 25%</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>854</td>
<td>25 up to 50%</td>
<td>10</td>
<td>6%</td>
</tr>
<tr>
<td>801</td>
<td>50 up to 75%</td>
<td>22</td>
<td>14%</td>
</tr>
<tr>
<td>812</td>
<td>75 up to 100%</td>
<td>121</td>
<td>76%</td>
</tr>
<tr>
<td>3238</td>
<td>Total cases</td>
<td>159</td>
<td>Total HF</td>
</tr>
</tbody>
</table>
Transmission Pattern exhibited by # of Cases (2011 MEEDS)
Conclusion

• IRS important element to further reduce transmission in Zanzibar
• Targeted IRS to reduce costs and increase effectiveness
• Insecticide resistance mitigation plan needed
• Other interventions are key for IRS success (IVM, Malaria Surveillance and Response)
• Malaria case notification established to better characterize and identify (GPS) malaria cases