Papua New Guinea: LLIN universal coverage

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Rotary Against Malaria

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• Round 3 Grant: 2004 – 2009
  – Long-lasting insecticide treated nets (LLIN)
  – Rapid Diagnostic Tests (RDT)
  – Microscopy (training, QC)

• Round 8 Grant: 2009 – 2013
  – LLIN
  – RDT & microscopy
  – Artemisinin-based Combination Therapy (ACT)
  – Behaviour change campaign / advocacy
Based on previous distributions of LLINs throughout PNG, RAM distributions will be based on districts that have not had a previous LLIN distribution in the last three years. Therefore first year concentrates on southern PNG and the New Guinea islands.
LLIN universal coverage

Round 3 Grant: 2004 – 2009

- Import of LLIN (PermaNet)

Round 8 Grant: 2009 – 2014

- Delivery to provincial / district headquarters

- LLIN distribution campaign

DEPARTMENT OF HEALTH
2.5 Million PermaNets delivered to districts

19/20 provinces received nets

2.5 people per net; sufficient for almost total coverage

Free distribution by district health authority
Malaria in PNG

Cibulski 2008
Evaluation

After distribution campaign
17 provinces, 1958 households, 10257 individuals

Before distribution campaign
7 Sentinel Sites, 696 households, 3256
% of households owning a mosquito net (2008/2009)

After distribution campaign
1958 households in 17 provinces

Before distribution campaign
696 households in 7 Sentinel Sites
Village level coverage

% of villages reaching target coverage (2008/2009)

- > 80%: 43.8%
- 50-79%: 32.8%
- 10%-49%: 12.5%
- < 10%: 10.9%
Mosquito net usage

% sleeping under mosquito net

After distribution campaign
10257 individuals in 17 provinces

Before distribution campaign
3256 individuals in 7 Sentinel Sites
Mosquito net usage

% sleeping under LLIN by region

Ownership:

<table>
<thead>
<tr>
<th>Region</th>
<th>Children &lt;5 years</th>
<th>Pregnant women</th>
<th>Overall</th>
<th>Mosquito net (any type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern</td>
<td>45.1</td>
<td>56.9</td>
<td>40.4</td>
<td></td>
</tr>
<tr>
<td>Highlands</td>
<td>27.1</td>
<td>27.1</td>
<td>22.7</td>
<td></td>
</tr>
<tr>
<td>Momase</td>
<td>55.4</td>
<td>63.6</td>
<td>47.0</td>
<td></td>
</tr>
<tr>
<td>Islands</td>
<td>32.7</td>
<td>37.8</td>
<td>25.4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>LLIN</th>
<th>&gt; 1 LLIN</th>
<th>Mosquito net (any type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern</td>
<td>64.5</td>
<td>47.4</td>
<td></td>
</tr>
<tr>
<td>Highlands</td>
<td>56.3</td>
<td>26.7</td>
<td></td>
</tr>
<tr>
<td>Momase</td>
<td>68.7</td>
<td>39.4</td>
<td></td>
</tr>
<tr>
<td>Islands</td>
<td>70.2</td>
<td>44.0</td>
<td></td>
</tr>
</tbody>
</table>

Percentage of households
Efficacy of PermaNets

Deltametrin content (initial target dose: 55mg/m²)

Bioassay

Figure 7. Overall percentage of PN 2.0 passing WHO criteria after 1, 2, 3, 4 and more years of use in PNG.
### Efficacy of PermaNets

Bioassays with PermaNets used for 1 to 3 years in PNG

<table>
<thead>
<tr>
<th>Test / mosquitoes</th>
<th>Knock Down 60min</th>
<th>Mortality 24h</th>
<th>Passed WHO criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cone test (n=59) <em>Ae. aegypti</em> (Bora Bora)</td>
<td>2-100%</td>
<td>0-100%</td>
<td>39%</td>
</tr>
<tr>
<td>Cone test (n=14) <em>An. epiroticus</em> (Can Gio)</td>
<td>60-100%</td>
<td>83-100%</td>
<td>100%</td>
</tr>
<tr>
<td>Tunnel test (n=19) <em>Ae. aegypti</em> (Bora Bora)</td>
<td>-</td>
<td>61-100%</td>
<td>95%</td>
</tr>
<tr>
<td>WHO threshold</td>
<td>≥95%</td>
<td>≥80%</td>
<td>92%</td>
</tr>
</tbody>
</table>

Bioassays with PNG mosquitoes in progress at IMR
Summary

- Distribution increased LLIN ownership from <10% to >60%
- Distribution increased LLIN usage from 5% to >30%
  but not overall net use
- Large disparity between ownership and usage

- Coverage and usage remain below 80% target

- LLIN efficacy is still good after 3 years of use, however, needs to be tested on local anophelines

- Operational difficulties at district level