Updates on ABCDR study in Tanzania

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Study Overview

- 8 districts in Tanzania – 3,420 households in 76 villages

- Retrospective study: Durability of Olyset campaign nets

- Prospective study:
  - Olyset
  - PermaNet2.0
  - Netprotect

- Compare durability over 3 years

- Attrition, physical degradation, bio-efficacy & chemical content

Data from return net database
Oct – Dec 2013

**All collected nets (n = 6,537)**
- LLINs: 77%
- Untreated nets: 20%
- No label: 3%

**All LLINs (n = 5,054)**
- Olyset: 96%
- PermaNet: 4%

**All Olyset nets (n = 4,852)**
- Olyset net sizes:
  - Single: 51%
  - Double: 49%
- Untreated net sizes:
  - Single: 49%
  - Double: 51%

- Olyset colors:
  - Light blue (81%)
  - Blue white stripe (16%)
  - White (2%)
  - Others (<1%)
Attrition of campaign nets

Attrition = \frac{\text{number of light-blue Olyset nets collected}}{\text{reported number of campaign nets received}}

--> Add unique identifiers to distinguish nets for monitoring– labels fall off
### Bioefficacy and Holes

#### Number of campaign nets failing WHO criteria

<table>
<thead>
<tr>
<th>Condition</th>
<th>4 years (n=24)</th>
<th>3 years (n=122)</th>
<th>2 years (n=48)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;80% Anopheles 24hr mortality (WHO cone)</td>
<td>20 (83.3%)</td>
<td>98 (80.3%)</td>
<td>31 (64.6%)</td>
<td><strong>149 (76.8%)</strong></td>
</tr>
<tr>
<td>&lt;80% An. 24 hr mortality &amp; &gt;10% blood-feeding (WHO tunnel)</td>
<td>1 (4.2%)</td>
<td>5 (4.1%)</td>
<td>4 (8.3%)</td>
<td><strong>10 (5.2%)</strong></td>
</tr>
<tr>
<td>&lt;15.0 g/kg permethrin (HPLC)</td>
<td>9 (37.5%)</td>
<td>28 (23.0%)</td>
<td>5 (10.4%)</td>
<td><strong>42 (21.7%)</strong></td>
</tr>
<tr>
<td>‘Too torn’ 1</td>
<td>13 (54.2%)</td>
<td>42 (34.4%)</td>
<td>21 (43.8%)</td>
<td><strong>76 (39.2%)</strong></td>
</tr>
</tbody>
</table>

1 using hole counts, proportionate Hole Index (pHI) >643 & hole surface area >790cm$^2$
Prospective Study
Attrition at “Year 1”

- 10,598 nets distributed Oct-Dec 2013 – equal numbers of 3 LLIN brands
- 10 months follow up (Aug-Oct 2014): 9,684 nets accounted for

Net still in household?

- YES 76.5% (n=7,405)
- NO 23.1% (n=2,236)

In use?

- YES 71.2% (n=5,262)
- NO 28.8% (n=2,128)

Nets no longer used for sleeping
- 13.9% (n=310)

Nets used elsewhere
- 85.1% (n=1,903)
n=2,128 nets not currently in use

- save net for future use/visitors: 28%
- no mosquitoes: 17%
- user did not sleep here there last night: 15%
- other: 14%
- net too hot/dirty/small: 11%
- used a different net: 8%
- enough nets currently in use: 5%
- net too old/too torn: 2%
- e.g. bed bugs, no place to hang, makes me sneeze: 17%
# Hole counting

<table>
<thead>
<tr>
<th>Category of Hole</th>
<th>Hole Size Description</th>
<th>Hole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>Smaller than a thumb (finger)</td>
<td>0.5 - 2 cm diameter</td>
</tr>
<tr>
<td>Size 2</td>
<td>Larger than a thumb but smaller than fist (hand)</td>
<td>2 - 10 cm diameter</td>
</tr>
<tr>
<td>Size 3</td>
<td>Larger than a fist but smaller than a head (head)</td>
<td>10 - 25 cm diameter</td>
</tr>
<tr>
<td>Size 4</td>
<td>Larger than a head</td>
<td>&gt; 25 cm diameter</td>
</tr>
</tbody>
</table>
Physical degradation

Following WHO protocol; hole counts in the field of 6,134 nets

<table>
<thead>
<tr>
<th>Category</th>
<th>pH range</th>
<th>Hole surface area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>0 - 64</td>
<td>&lt;79 cm²</td>
</tr>
<tr>
<td>Damaged</td>
<td>65 - 642</td>
<td>80–789 cm²</td>
</tr>
<tr>
<td>Too torn</td>
<td>643+</td>
<td>&gt;790 cm²</td>
</tr>
</tbody>
</table>

- 32% (1,969) No Holes
- 68% (4,165) With Holes

- 35% (1,434) Damaged
  - 51% (2,126) Good
  - 14% (605) Too torn

- 90% (5,529) “Good nets”
- 10% (605) “Unserviceable”
1. At what level does net loss and degradation occur?

- Environment
- Household
- Sleeping Space
- Individual User

2. When does a net stop being truly protective against mosquitoes?

- Correlating semi-field tests using whole nets from the field with WHO cut-offs and laboratory tests

3. What happens to nets when they are no longer deemed useful to sleep under?
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