Impact of Indoor Residual Spraying on Malaria Transmission in Moderate and Low Settings

Rajendra Maharaj
Malaria Research Unit
Medical Research Council
South Africa
Context

• Low transmission: South Africa
  – High in the 1930s but low in 2000s

• Moderate transmission: Mozambique
  – High in early 2000s but moderate now
Malaria Risk in South Africa
Past and Present

• Major gains have been made in controlling malaria
• Encourage agriculture and tourism
• For the past 65 years have had efficient IRS programme in place
Malaria Prevalence in Mozambique Maputo Province (2 to <15 years)
Entomological Impact

Average *A. funestus* group and *A. gambiae s.l* per hut per day
Zone 1

Spraying
Regional Impact

**BASELINE**

**SOUTH AFRICA**

Incidence Per 1000 Population

- 18 to 66
- 6 to 18
- 3 to 6
- 1.5 to 3
- 1 to 1.5
- 0 to 1

**MOZAMBIQUE**

Plasmodium falciparum prevalence in children aged 2 to < 15 years

**BASELINE**

<table>
<thead>
<tr>
<th>Zone</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>64%</td>
<td>86%</td>
</tr>
<tr>
<td>Zone 1A</td>
<td>64%</td>
<td>86%</td>
</tr>
<tr>
<td>Zone 2</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>Zone 2A</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>Zone 3</td>
<td>76%</td>
<td>76%</td>
</tr>
</tbody>
</table>

**LATEST (2006)**

<table>
<thead>
<tr>
<th>Zone</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 1</td>
<td>3.9%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Zone 1A</td>
<td>29.5%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Zone 2</td>
<td>17.5%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Zone 2A</td>
<td>13.7%</td>
<td>13.7%</td>
</tr>
<tr>
<td>Zone 3</td>
<td>28.6%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

**SWAZILAND**

Malaria Incidence Per 1000 Population: Lubombo District

1996

| 130 |

2005/2006

| 1.30 |
The location of more than 54,000 homesteads were GPS’d
Management tool for IRS planning
Can be used for determining foci of transmission.
Conclusion

• IRS is effective in decreasing malaria transmission in low and moderate settings
• Can reduce the number of cases quite rapidly.