The Elimination of malaria in Sri Lanka

Source: Anti-Malaria Campaign, Sri Lanka Ministry of Health

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Timeline of malaria elimination in Sri Lanka

- **1911**: First anti-malaria centre set up (Kurunegala)
- **1913**: Incrimination of vector *An. culicifacies*
- **1921**: Appointment of first malarialogist
- **1946**: Introduction of DDT
- **1948**: Malaria eradication programme launched
- **1958**: Resurgence of malaria leads to a national epidemic
- **1967–1968**: Introduction of λ-cyhalothrin
- **1969**: DDT resistance in *An. culicifacies*
- **1970**: Anti-Malaria Campaign decentralized
- **1989**: 1994: World Bank project commenced
- **1998**: RBM launched
- **2000**: Global Fund support begins
- **2007**: ACT introduced
- **2012**: Last indigenous case
- **2016**: WHO malaria-free certification

Source: Anti-Malaria Campaign, Sri Lanka Ministry of Health
Two opportunities for malaria elimination in Sri Lanka

Number of malaria cases, log scale

Source: Anti-Malaria Campaign, Sri Lanka Ministry of Health
Remarkable progress to elimination – how did we do it?

This enormous accomplishment is the result of dedicated, multi-pronged efforts of healthcare staff and policy decision-makers over two decades:

- Targeting high-risk populations with aggressive quality assured **diagnosis and treatment** (microscopy, RDTs, ACT)
- Radical and complete cure
- Access to diagnosis and treatment
- Targeting high-risk areas with **vector control** interventions (ITNs, IRS)
- Strong programme management and emphasis on **surveillance**
- **Rapid response**
- **Strong partnerships** (military, UNHCR, etc)
- Political commitment and **leadership** from the Anti-Malaria Campaign
- **Investment** from government administrations and the Global Fund
Malaria among Armed Forces Personnel 2009/2010

• 55% of all cases were relapses
• Index cases of almost all local outbreaks were relapsing cases
• Six foci (hot spots) were defined
  • Vellankulam
  • Mulankavil
  • Killinochchi/Kokavil
  • Thunukkai
  • Mulathivu
  • Yala

Collaborated with SLA to provide radical cure

Contributor: Lt. Col Saveen Gamage, Sri Lanka Army
## Disease burden due to malaria 1999-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Cases</th>
<th>Number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indigenous</td>
<td>Imported</td>
</tr>
<tr>
<td>1999</td>
<td>264,549</td>
<td>102</td>
</tr>
<tr>
<td>2000</td>
<td>210,039</td>
<td>76</td>
</tr>
<tr>
<td>2001</td>
<td>66,522</td>
<td>53</td>
</tr>
<tr>
<td>2002</td>
<td>41,411</td>
<td>30</td>
</tr>
<tr>
<td>2003</td>
<td>10,510</td>
<td>4</td>
</tr>
<tr>
<td>2004</td>
<td>3,720</td>
<td>1</td>
</tr>
<tr>
<td>2005</td>
<td>1,640</td>
<td>-</td>
</tr>
<tr>
<td>2006</td>
<td>591</td>
<td>-</td>
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<tr>
<td>2007</td>
<td>198</td>
<td>1</td>
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<tr>
<td>2008</td>
<td>649</td>
<td>23</td>
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<tr>
<td>2009</td>
<td>531</td>
<td>27</td>
</tr>
<tr>
<td>2010</td>
<td>684</td>
<td>52</td>
</tr>
<tr>
<td>2011</td>
<td>124</td>
<td>51</td>
</tr>
<tr>
<td>2012</td>
<td>23</td>
<td>70</td>
</tr>
<tr>
<td>2013</td>
<td>-</td>
<td>95</td>
</tr>
<tr>
<td>2014</td>
<td>-</td>
<td>49</td>
</tr>
<tr>
<td>2015</td>
<td>-</td>
<td>37</td>
</tr>
<tr>
<td>2016</td>
<td>-</td>
<td>41</td>
</tr>
</tbody>
</table>
Indigenous and imported malaria in Sri Lanka

Source: Anti-Malaria Campaign, Sri Lanka Ministry of Health
## Distribution of imported cases by country of origin, 2012

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>At PoE</th>
<th>Within the country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pf</td>
<td>Total</td>
</tr>
<tr>
<td>Benin</td>
<td>20</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Ghana</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Guinea</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Haiti</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>India</td>
<td>28</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Liberia</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Nigeria</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sierra Leon</td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Togo</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>West Africa (Gabon)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Distribution of imported cases by nationality-2013

- Sri Lankan Civil, 57, 60%
- Foreigners, 35, 37%
- Sri Lankan Army, 3, 3%

- Pakistani: 17
- Indian: 9
- Burmese: 2
- Ugandan: 1
- English: 1
- Indonesian: 1
- Korean: 1
- Tajik: 1
Distribution of cases by district/RMO Region-2012

- BIA, Katunayake
- Colombo
- Jaffna
- Gampaha
- Kandy
- Kalutara
- Kalmune
- Batticaloa
- Vavuniya
- Badulla
- Puttalam
- Kurunegala
- Trincomalie
- Mullativu
- Matara
- Galle
- N' Eliya
- Kegalle
- Ratnapura
- Moneragala
- Polonnaruwa
- Anuradhapura
- Maho
- Ampara
- Mannar
- Kilinochchi
- Hambantota

Legend:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December
Serious threats could re-introduce malaria and reverse historic gains

- Imported cases and cross-border issues
- Presence of the mosquito vector
- Resistance to artemisinin and insecticides
- Health security
- Lost immunity
- Malaria is forgotten
- Donor dependency
Time to diagnosis in indigenous malaria patients - 2012

Days from onset of illness to blood test

- 52% of patients having 5 days or less
- 22% of patients having 6-10 days
- 26% of patients having more than 10 days
Time to diagnosis in imported malaria patients - 2012

Days from onset of illness to blood test

% of patients having 5 days or less: 50%
% of patients having 6-10 days: 32%
% of patients having more than 10 days: 18%
Time to diagnosis in imported malaria patients - 2013

Days from onset of illness to blood test

- % of patients having 5 days or less: 37%
- % of patients having 6-10 days: 33%
- % of patients having more than 10 days: 31%
Four Strategies

• Strengthening surveillance for malaria case detection
• Maintaining clinical skills for diagnosis and treatment of malaria
• Strengthening entomological surveillance and response through integrated vector management
• Strengthening systems for outbreak forecasting, preparedness, prevention and response
6 cross-cutting approaches

- IEC to raise awareness of the malaria elimination programme
- Quality assurance
- Enhanced monitoring and evaluation
- Improved programme management and performance
- Operations and implementation research
- Working in partnerships
Prevention of Reintroduction (PoR) requires re-doubled commitment for critical malaria programming

1. Maintaining a strong and resilient malaria surveillance system
2. Monitoring and controlling the mosquito vector
3. Screening people who are at high risk of importing malaria
4. Ensuring that health care providers and communities remain vigilant and aware of malaria prevention, symptoms, and treatment
Cost savings

Figure 2: Cost-Savings Due to Efficient Use of Insecticides (2008-2014)

SLR 984 million total insecticide allocation

SLR 653 million savings

SLR 331 million total insecticide expenditure
Thank you