The Trachoma Surveys by Segment and “TT40” methods in seven districts in Kenya

To test two new trachoma survey methods to determine the need for mass drug administration (MDA) and surgical services for trachomatous trichiasis (TT).

**Introduction**

- The recommended trachoma intervention unit is an administrative district with approximately 100,000 people.
- In Kenya, the population of the endemic administrative districts range from 80,000 to 1,000,000 people and is clustered.
- The initial surveys conducted in large districts (>200,000 people) survey clusters were widely scattered.
- Some endemic areas were missed and non-endemic areas were included in MDA.
- The missed endemic areas may re-infect the treated areas.
- Treating non-endemic areas is a waste of resources. In Kenya the cost of MDA is US$0.20 to $0.42 per person treated.
- The efficiency of trachoma surveys is reduced by the large TT samples when the minimum age limit of 15 years is used because the prevalence of TT is usually low young people.

**Research question:** How can one conduct effective and efficient trachoma prevalence surveys?

**Methods**

**The TSS method**

- The “Trachoma Survey by Segment” (TSS) method was developed to identify the areas that need intervention.
- Surveys were conducted in geographical areas (segments) with 100,000 to 200,000 people and having a similar risk of trachoma.
- In Turkana, the forward segment was the only segment with <100 people (Figure 1).
- The survey clusters had children and 20 adults and the design effect for TSS and TT40 was 2.0 and 1.5 respectively.

**Cost comparison**

- Cost of trachoma survey and MDA in a hyper-endemic (Turkana) setting and a meso-endemic setting with clustered trachoma were compared.
- The cost for Nakor was known but for Turkana it was estimated to cost US$0.42 per person because it is a ‘hard to reach’ district.
- The two districts were divided into 5 survey segments each but the area of Turkana was larger than Nakor.

**Table 2: Re-analysis of the previous TT survey data sets**

<table>
<thead>
<tr>
<th>Age of survey participants in years</th>
<th>Total TT cases</th>
<th>Backlog Prevalence Prevalence subjects examined (% of total) correction of correction (years)</th>
<th>factor*</th>
<th>TT (%) factor*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 5</td>
<td>1.111</td>
<td>189 (53.5)</td>
<td>1.7</td>
<td>15.2</td>
</tr>
<tr>
<td>6 to 15</td>
<td>1.775</td>
<td>233 (73.1)</td>
<td>1.4</td>
<td>13.0</td>
</tr>
<tr>
<td>16 to 19</td>
<td>2.925</td>
<td>275 (80.7)</td>
<td>1.1</td>
<td>9.4</td>
</tr>
<tr>
<td>20 to 29</td>
<td>4.450</td>
<td>296 (83.7)</td>
<td>1.1</td>
<td>6.7</td>
</tr>
<tr>
<td>30 to 39</td>
<td>4.475</td>
<td>299 (85.5)</td>
<td>1.0</td>
<td>5.3</td>
</tr>
<tr>
<td>40 to 49</td>
<td>5.825</td>
<td>326 (92.5)</td>
<td>1.0</td>
<td>4.7</td>
</tr>
<tr>
<td>50 to 59</td>
<td>4.155</td>
<td>301 (90.0)</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>60 to 69</td>
<td>5.798</td>
<td>319 (92.5)</td>
<td>1.0</td>
<td>3.8</td>
</tr>
</tbody>
</table>

**Figure 1: Map of Kenya showing the surveyed segments**

- Age cut-off of 1 age categories is the standard for TT survey

**Table 1: Prevalence of TT and need for MDA**

<table>
<thead>
<tr>
<th>Survey segments (numbered and administrative areas)</th>
<th>Number</th>
<th>% with TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. West Turkana</td>
<td>914</td>
<td>67.0</td>
</tr>
<tr>
<td>2. Northern Turkana</td>
<td>829</td>
<td>46.1</td>
</tr>
<tr>
<td>3. Southern Turkana</td>
<td>823</td>
<td>31.1</td>
</tr>
<tr>
<td>4. Central Turkana</td>
<td>795</td>
<td>29.3</td>
</tr>
<tr>
<td>5. Kakuma</td>
<td>588</td>
<td>23.2</td>
</tr>
<tr>
<td>6. Transmara district</td>
<td>276</td>
<td>30.8</td>
</tr>
</tbody>
</table>

**Discussion**

- The TSS methods provided standardized population units for surveys and interventions in districts with different population sizes and clustered trachoma. This improved the efficiency to identify the endemic areas in large districts.
- The minimum age limit for TT survey participants should be reviewed regularly in line with the changing trends. Globally, the number of people with TT is decreasing while the burden of TT is increasing.
- In the areas where TT has been eliminated, TT is found in people >40 years old.

**Conclusion**

- The “TSS” is an effective trachoma survey method to identify the areas that need mass antibiotic treatment.
- In hyper-endemic districts, either the TSS or standard survey method can be used to justify short term (3 years) MDA.
- A “TT40” survey, with correction factors, is an efficient method to determine the backlog of people with TT.

**Acknowledgements**

The surveys were sponsored by the:

- Government of Kenya
- European Union
- Sight savers
- Operation Eyesight Universal
- Fred Hollows Foundation
- African Medical and Research Foundation
- Spanish Volunteer Eye Doctors

Travel grants were provided by the:

- Sight savers
- Harold Mitchell Foundation
- William Angliss (Victoria) Charitable Fund

**Bibliography**