Costs of surveys and mass drug administration (MDA) for active trachoma in high and low endemic districts in Kenya

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Competing interest: None
Introduction

• A trachoma prevalence survey is mandatory prior to MDA.

• The starting threshold for MDA is >10% prevalence of active trachoma (TF) in children 1-9 years old and stopping <5%.

• Prevalence 10%-30% treat annually x 3 years then conduct impact assessment trachoma prevalence survey to justify continuation.

• If prevalence >30% treat annually x 5 years, then assess.

• Recommended intervention unit for trachoma = administrative district of approximately 100,000 people each (trachoma district).
Introduction

• Kenya modified survey methods because of large variation in the population sizes of administrative districts: 100,000 to 1,000,000 people. Trachoma is found in arid areas/nomadic communities.

• In the large districts (>200,000 people) clusters for a survey by administrative district are widely spaced.

• In the initial survey some endemic communities were missed and some non-endemic ones included in MDA.

• The aim was to compare the costs of surveys and MDA in low and high trachoma-endemic districts by the standard and a new survey methods.
Methods

• New method: divide the large district into geographical areas with 100,000-200,000 people each and similar risk of trachoma.

• Survey each of the areas (segments) separately.

• Baseline survey to justify MDA in Turkana district: 533,837 people, 77,000 KM$^2$, borders Uganda, Southern Sudan and Ethiopia.

• Impact assessment survey to justify continuation of MDA in Narok district: 576,388 people, 17,128 KM$^2$, borders Tanzania.

• The incremental costs of trachoma surveys and MDA in Kenya were extracted from project financial reports.
## Results

<table>
<thead>
<tr>
<th>Districts</th>
<th>Survey segments</th>
<th>Prevalence of TF</th>
<th>MDA requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Standard survey method</td>
</tr>
<tr>
<td>TURKANA</td>
<td>Western Turkana</td>
<td>67.6</td>
<td>N/A*</td>
</tr>
<tr>
<td></td>
<td>Northern Turkana</td>
<td>46.4</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Southern Turkana</td>
<td>31.2</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Central Turkana</td>
<td>20.5</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Kakuma refugee camp</td>
<td>14.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Entire district</td>
<td></td>
<td><strong>38.0</strong></td>
<td>5 years</td>
</tr>
<tr>
<td>NAROK</td>
<td>South Western</td>
<td>26.7</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>South Eastern</td>
<td>21.6</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Central</td>
<td>4.3</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>North Eastern</td>
<td>2.1</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>North Western</td>
<td>0.4</td>
<td>N/A</td>
</tr>
<tr>
<td>Entire district</td>
<td></td>
<td><strong>11.0</strong></td>
<td>3 years</td>
</tr>
</tbody>
</table>

*N/A = not applicable*
Costs

- A survey by standard method = **US$27,160** (20 clusters) and a survey by new method = **US$32,592** (100 clusters).

- Distribution cost for a single treatment in Narok was **US$0.26**.

- Assume 100,000 people per segment @ US$0.26 x 3 segments (excluded in Narok) x 3 years project cycle = **US$78,000**.

- A single dose of donated zithromax = **U$20** in Kenya.

- Assume 100,000 people x 3 excluded segments @ US$20 x 3 years = **US$18,000,000**.
Conclusions

NAROK (District with low prevalence and clustered disease)
• Survey by segments reduces costs by exclusion of non-endemic segments from MDA.

TURKANA (highly trachoma-endemic district)
• In the short term (3 years) the new survey method had no benefit over the standard survey (same decision for MDA).
• In the long term (>3 years) the segments with prevalence <30% may be excluded from MDA after an impact assessment.
Trachoma maps are available at: www.trachomaatlas.org
What is the appropriate age of participants for a survey to estimate the prevalence of trachomatous trichiasis (TT)?

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Competing interest: None
Introduction

• TT prevalence increases with advancing age.

• The age limit of people $\geq 15$ years is recommended for TT surveys and sample sizes are large because TT prevalence in people $\geq 15$ years is usually low. Researchers often trade off small sample sizes for reduced precision in prevalence estimation.

• The purpose of a TT survey is to determine the backlog of TT for planning surgical services, not to case find. TT coverage is low; why spend a lot of recourses trying to establish the total backlog?

• TT is found in people $\geq 40$ years old in places where active trachoma has been eliminated. Example: Sichuan province, China
Introduction

- RAABs (age limit ≥15 years) are increasingly being employed for assessing need and measuring the impact of interventions for control of blindness.

- If TT surveys are conducted in the same districts after RAABs it would result in “wasted surveys”.

- The aim of this study was to determine the appropriate age of participants for subsequent TT surveys.

- There is need to ensure that TT (adults) and TF (children) surveys are completed within the same period of time.
Methods

- Data for previously-conducted surveys where the age limit of ≥15 years was used were re-analysed.

- The surveys were conducted in six administrative districts in Kenya in 2004 and 2007 and the sample size was achieved in all the surveys.

- A total of 7,944 subjects aged ≥15 years old were examined and 316 (4.0%) had TT.
## Results

<table>
<thead>
<tr>
<th>Age limit (years)</th>
<th>Samburu</th>
<th>West Pokot</th>
<th>Baringo</th>
<th>Kajiado</th>
<th>Meru North</th>
<th>Laikipia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50</td>
<td>63(76.8)</td>
<td>62(78.5)</td>
<td>60(72.3)</td>
<td>24(52.2)</td>
<td>9(81.8)</td>
<td>13(86.7)</td>
<td>231(73.1)</td>
</tr>
<tr>
<td>&gt;40</td>
<td>73(89.0)</td>
<td>72(91.1)</td>
<td>74(89.2)</td>
<td>32(69.6)</td>
<td>10(90.9)</td>
<td>14(93.3)</td>
<td>275(87.0)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>80(97.6)</td>
<td>74(93.7)</td>
<td>80(96.4)</td>
<td>37(84.4)</td>
<td>10(90.9)</td>
<td>15(100)</td>
<td>296(93.7)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>82(100)</td>
<td>79(100)</td>
<td>82(98.8)</td>
<td>45(97.8)</td>
<td>11(100)</td>
<td>15(100)</td>
<td>314(99.4)</td>
</tr>
<tr>
<td>&gt;15</td>
<td>82(100)</td>
<td>79(100)</td>
<td>83(100)</td>
<td>46(100)</td>
<td>11(100)</td>
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<td>TOTAL</td>
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<td>46(100)</td>
<td>11(100)</td>
<td>15(100)</td>
<td>316(100)</td>
</tr>
</tbody>
</table>
% of TT cases missed

Age of survey participants in years

% of TT cases missed

0.0  0.6  2.5  6.3  8.9  13.0  21.2  26.9  37.5  46.5  61.7  70.9  88.9  89.9  96.2  98.7

15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90
• The age \( \geq 40 \) years was selected for subsequent TT prevalence surveys.

• Prevalence of TT in people \( \geq 40 \) years was 10% and thus a smaller sample size was needed than for age \( \geq 15 \) years.

• Backlog of TT in Turkana district was 5,932 people \( \geq 40 \) years old. The district was conducting about 100 TT surgeries per year.

• Narok district the backlog was 2,084 people \( \geq 40 \) years old. The district was conducting about 200 TT surgeries per year.
Conclusions

• The age of \( \geq 40 \) years is the most appropriate age for TT surveys.

• A third of the backlog would have been missed if age limit of \( \geq 50 \) years was adopted.

• Consider age limit \( \geq 40 \) years when conducting RAABs in trachoma endemic districts.

• See WOC electronic poster PO-EPI-17 for prevalence and backlog of TT correction factors
Limitations

- The findings could not be generalized because all the surveys were conducted in one country.

- The population age structure and the natural history of TT may vary in different communities.

- Further studies are required to identify the most appropriate age range of individuals to be included in a TT survey.
Surveys funded by

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