Costs and consequences of trachoma survey and mass drug administration in the Narok district in Kenya

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Aim

To determine and compare the costs of mass drug administration using the standard and a proposed survey methods.

Methods

An impact assessment trachoma survey was conducted in Narok administrative district in Kenya in November to December 2010 to justify continuation of mass drug administration (MDA) for active trachoma after 3 annual rounds of mass treatment (2008-2010). The World Health Organization recommends trachoma surveys and control to be conducted in administrative districts. A district is assumed to have a population of about 100,000 people1. The entire population is treated with antibiotic if the prevalence of TF (trachomatous follicular inflammation) in children1-9 years old is >10%.2 Some districts in Kenya are large (>200,000 people) and trachoma is clustered. Before this study trachoma surveys in Kenya (Figure 1) were conducted by the standard survey method3. Some trachoma-endemic communities in large hypo-endemic districts (prevalence >10%) were missed and non-endemic communities in large endemic districts (prevalence >10%) were included in MDA.

Information from key informants and the 2004 baseline survey report2 were used to assess the likely distribution of trachoma in Narok district. The research team used that information and divided the district into 5 geographical areas (survey segments) of approximately equal population. Each segment was surveyed separately. Narok South is arid and is inhabited by the nomadic Masai communities (higher risk of trachoma). Narok North is highlands and has settled agricultural communities (low risk). Two survey segments were created in Narok south, two in Narok North and one in Narok Central. Clinical examinations were done at the households by four experienced graders with high Inter-observer agreement (kappa >0.95). The WHO simplified trachoma grading scheme was used. The sample size was 4,000 children (800 per segment) and systematic sampling was used to select 20 clusters per segment (40 children per cluster). Prevalence of TF was determined for each segment (proposed method). The mean prevalence for the 5 segments was the prevalence estimate for the whole district (the standard method). The segments with prevalence <10% were excluded from MDA.

The data for the cost of MDA were extracted from the 2009 project report. The cost of antibiotics was not included because they were donated. The total population at the time of the MDA was estimated to be 543,199 people.

This study was approved by the Kenya Medical Research Institute (KEMRI) Ethics Review Committee and the Royal Victorian Eye and Ear Hospital Human Research Review Committee.

Figure 1: Kenya TF map (2010)

Results

Prevalence of TF

Four thousand children were examined but 2 were excluded from the analysis because the age of one was not indicated and the other was >9 years old.

Table 1: Prevalence of TF in Narok district

<table>
<thead>
<tr>
<th>Survey segments</th>
<th>Total examined</th>
<th>Children 1-9 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With TF</td>
<td>% with TF</td>
</tr>
<tr>
<td>South Western</td>
<td>799</td>
<td>213</td>
</tr>
<tr>
<td>South Eastern</td>
<td>800</td>
<td>173</td>
</tr>
<tr>
<td>Central</td>
<td>800</td>
<td>34</td>
</tr>
<tr>
<td>North Eastern</td>
<td>800</td>
<td>17</td>
</tr>
<tr>
<td>North Western</td>
<td>799</td>
<td>3</td>
</tr>
<tr>
<td>Narok district</td>
<td>3,998</td>
<td>440</td>
</tr>
</tbody>
</table>

Cost of survey

The total cost of a trachoma survey for Narok as a single district (standard method) was US$27,160 and by segments (proposed method) US$31,917.

Cost of MDA

The money spent on MDA in 2009 was US$96,705 and 376,989 people were treated. The cost per treatment was US$0.26 per year.

If the total estimated population of 543,199 people were treated, the annual costs for MDA would have been US$141,232 for the entire district (543,199 x 0.26) and US$56,493 for the two segments which needed MDA.

The cost of MDA per segment was US$28,246 and the money saved by excluding 3 segments was US$8,739 annually.

Discussion

Narok is a large district (population >200,000) and these results showed that the southern arid areas were trachoma-endemic and the northern highlands were non-endemic. If the survey was conducted by the standard survey method the entire district would have been treated for another three years because the prevalence of TF was 11%. Conducting MDA by segments reduced the project costs by 60% as treatment was needed in two segments out of the five.

A survey by proposed survey method was more expensive than a survey by standard method but the added cost of the survey was justified by the reduction in the cost of MDA.

Large districts with clustered trachoma should be surveyed by segments.

Acknowledgements

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Bibliography