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TRACHOMA CONTROL USING THE WHO ADOPTED "SAFE WITH AZITHROMYCIN."
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ABSTRACT

Objective: **To report on and share the experiences, accomplishments and lessons learnt by African Medical and Research Foundation (AMREF), Sight Savers International (SSI), University of Nairobi (UON) and the Ministry of Health (MOH) during implementation of a three year Shompole trachoma control pilot study using azithromycin. The target of the project was to reduce the prevalence of active and potentially blinding trachoma by 50% by the year 2005.**

Design: **Community based survey.**

Setting: **Shompole location, Magadi division, Kajiado district of the Rift Valley Province of Kenya.**

Subjects: **Five hundred and twenty six randomly selected households from 166 manyattas (bomas/homesteads) proportionately distributed in all the 13 villages of the four sub-locations of Shompole location were visited. Nine hundred and ninety eight children (1-9 years) and 898 adults (≥15 years) were examined for active trachoma (TF) and potentially blinding trachoma (TT) respectively.**

Results: **The prevalence of active trachoma (TF) in children has dropped from 46.4% in 2002 to 16.0% in 2006 and that of potentially blinding trachoma (TT) from 4.5% to 1.7% in the same period. Women have more TT than men. Out of the 15 cases of TT reported in the survey, only two were recurrences. The prevalence of active trachoma (TF) is higher in boys than girls, p=0.044. The proportion of children with clean faces has not changed but the proportion of children with many (>5) flies has drastically reduced from 48.0% in 2002 to 6.0% in 2006. The community holds strong negative believes about pit latrines. The project is sustainable.**

Conclusions: **This project has positively influenced eye care policy locally and globally. The targets for "SA" components of SAFE were achieved while "FE" components were partially achieved.**

Recommendations: **The ongoing scale up of the project to cover the whole of Kajiado district is justified. Formative study and review of the project's health promotion strategy is necessary. Collaboration and joint planning with neighbouring endemic districts of Kenya and Tanzania should be encouraged because of the nomadic nature of the Maasai who are the project beneficiaries.**

INTRODUCTION

Trachoma is the leading cause of preventable blindness in the World contributing to estimated 5.9 million blind people. It is an infectious disease commonly found in areas with hot, dry, and dusty climates. In May 1998, the 51st World Health Assembly adopted a resolution calling for the elimination of trachoma as a cause of blindness and recommended that Ministries of Health should pursue the "SAFE strategy" to do so. "SAFE" stands for surgery for trichiasis/entropion, antibiotics for

active disease, facial cleanliness, and environmental change to reduce transmission. It targets all key elements believed to be necessary for a short- and long-term intervention programme. In Kenya, majority of the trachoma endemic districts are found in the Rift Valley Province, Kajiado district included (1-4).

In 2002, the University of Nairobi (UON), African Medical and Research Foundation (AMREF) and Sight Savers International (SSI) conducted a baseline trachoma prevalence survey in Shompole location which revealed a very high level of blinding trachoma; far much higher than previously assumed. The survey report acted as the "whistle blower" of possible serious level of blinding trachoma in the country (3). Kenya was listed as a priority for trachoma control by International Trachoma Initiative (ITI) which is the lead agency for the global alliance for elimination of blinding trachoma by the year 2020 (GET 2020)(6,7). This baseline survey (in Shompole) provided a strong justification for a nationwide trachoma survey to be done in three phases of six districts each. Since then, international and local eye care Nongovernmental Organisations (NGOs) have committed large sums of resources towards national trachoma mapping and control. The first phase was conducted in 2004 and published in the East African Medical Journal (1). The second phase is due in 2007.

Between the year 2003 and 2006 a three-year control pilot project was implemented by AMREF, MOH and SSI in Shompole. It was implemented in line with GET 2020, a component of World Health Organisation (WHO) VISION 2020, a global initiative to eliminate avoidable blindness by the year 2020 guidelines. An end term evaluation was conducted in September 2006. The aims were to determine the extent to which the project's objectives have been realised, determine the sustainability of the outcomes/benefits of the project and document the lessons learned and best practices for informing on the replication and scale up of the project. The evaluation team consisted of one external evaluation consultant from the University of Nairobi (UON) and two internal evaluators from AMREF. The standardised trachoma survey protocol developed in 2003 by the ITI and adopted by the WHO was used. The WHO simplified trachoma grading allows for recording of clinical findings in a standardised way as follows: TF = Trachomatous follicular inflammation, TI = Intense trachomatous inflammation, TS = trachomatous conjunctival scarring, TT = trachomatous trichiasis and CO = corneal opacity due to trachoma. Active trachoma (TI and TF) is a contagious chronic keratoconjunctivitis which occurs mainly in children. TF is more specific to active trachoma than TI because it has less confounders and hence is used as the indicator for active disease in children. The blinding sequelae (TT and CO) occur in adults. TT is the indicator for potentially blinding trachoma in adults (8). The project implemented the entire SAFE strategy as recommended by WHO and ITI.

MATERIALS AND METHODS

Data collection tools, interview checklists and discussion guides were developed by the evaluation team. Several methods of data collection including an end term prevalence survey, Focus Group Discussions (FGDs), direct observations, review of documents and key informant interviews were employed in order to capture all the information needed and to ensure accuracy and consistency. The team met a large variety of key informants and project beneficiaries. They visited a total of 526 households in 166 randomly selected manyattas from all the 13 villages in Shompole location and examined all the available children aged 1-9 years and adults ≥15 years for active (TF) and potentially blinding trachoma (TT) respectively. Children in school were traced and examined at school.

A two days pre-survey workshop was convened to train the survey team (enumerators) on the standardised trachoma survey methods and survey logistics. The enumerators were skilled eye care workers from the Ministry of Health (MOH) and AMREF who had participated in the 2004 trachoma survey. Their ability to grade trachoma was tested using the set of standard WHO grading slides (6). They were also tested practically in the field during the pretest of data collection tools at a village, which had not been selected for survey.

The minimum sample size (Table 1) was calculated by a statistician using the following sampling details based on the ITI standard protocol (7):

1. Population estimate of Shompole location as per the 2005 household census done during mass antibiotic (Zithromax) dosing is about 7,000 people.

Table 1

Shompole Location: AMREF 2005 household census and allocation

Sub-location	Total population	No. of children <10 years	Minimum sample size (children 1-9 years)	No. of adults > 10 years	Minimum sample (adults >15 years)
Shompole	2,044	1,121	279	923	208
Pakase	1,886	1,118	278	768	175
Oloika	2,143	767	192	1376	313
Lenkobei	968	456	114	512	117
Total (Shompole location)	7,041	3,462	814	3,579	863

2. Children aged 1-9 years: assumed prevalence of TF = 15%, precision + 5% and design effect = 4
3. Adults aged ≥ 1 5 years: assumed prevalence of TT = 3%, precision + 1.5% and design effect = 2
4. Confidence level = 95%
5. 10% non-response was accommodated
6. The sampling clusters were villages.

The samples for eligible children and adults were distributed proportionately among the four sub-location. The sub-location samples were further distributed proportionately among all the clusters (villages). All the villages were sampled to ensure maximum geographical coverage.

There were four survey teams and one coordination team with two survey vehicles and one coordination vehicle. Each of the villages was surveyed by two teams. In a village, one team was dropped at the nearest and the other at the furthest boma (manyatta). They both moved towards the center of the village sampling the manyattas on their way until the sample was achieved. All eligible persons in the sampled households were examined. School children from eligible households were traced and examined in schools. The coordination team conducted FGDs; key informant interviews and took testimonies from beneficiaries at the time of survey. One grading form was used per household (mother and children; plus father if not recorded with one of his other wives). One environmental data form was filled per boma (household) because from the previous two surveys, it was found that Masaai families within a boma live together as a single enclosed family unit and have similar household environment.

The WHO simplified trachoma grading was used (9).

Data were entered and analysed using SPSS version 10.1. The Data for the 2002 baseline survey were collected before the ITI standardised protocol was developed and had to be re-analysed by the consultant to make them comparable to the evaluation data. In 2002, all ages and grades of trachoma were analysed while the evaluation survey strictly complied with the ITI protocol. The former defined children as all below 10 years and active trachoma as TF, TI or both. For TT those ten years and above were considered adults.

RESULTS

Of the 998 children aged 1-9 years examined (Table 2), 134 had TF. The prevalence of TF in this age group was 16.0% *(95%* CI: 9.9%-18.9%). Prevalence of active (Table 3) trachoma was higher in boys (18.2%) than in girls (14.0%), p = 0.044.

Table 2

Study population

	Children 1-9 years examined		Adults > 15 years examined	
Sex	No.	(%)	No.	(%)
Male	474	47.5	220	24.5
Female	498	49.9	678	74.8
Not indicated	26	2.6	6	0.7
Total	998	100	898	100

Figure 1

Shompole location: trend of active trachoma (TF)

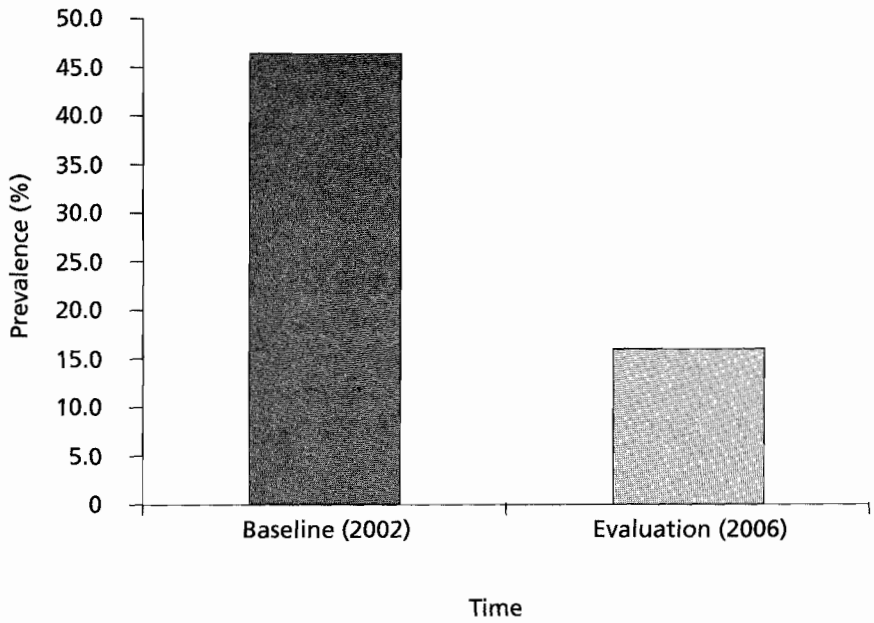
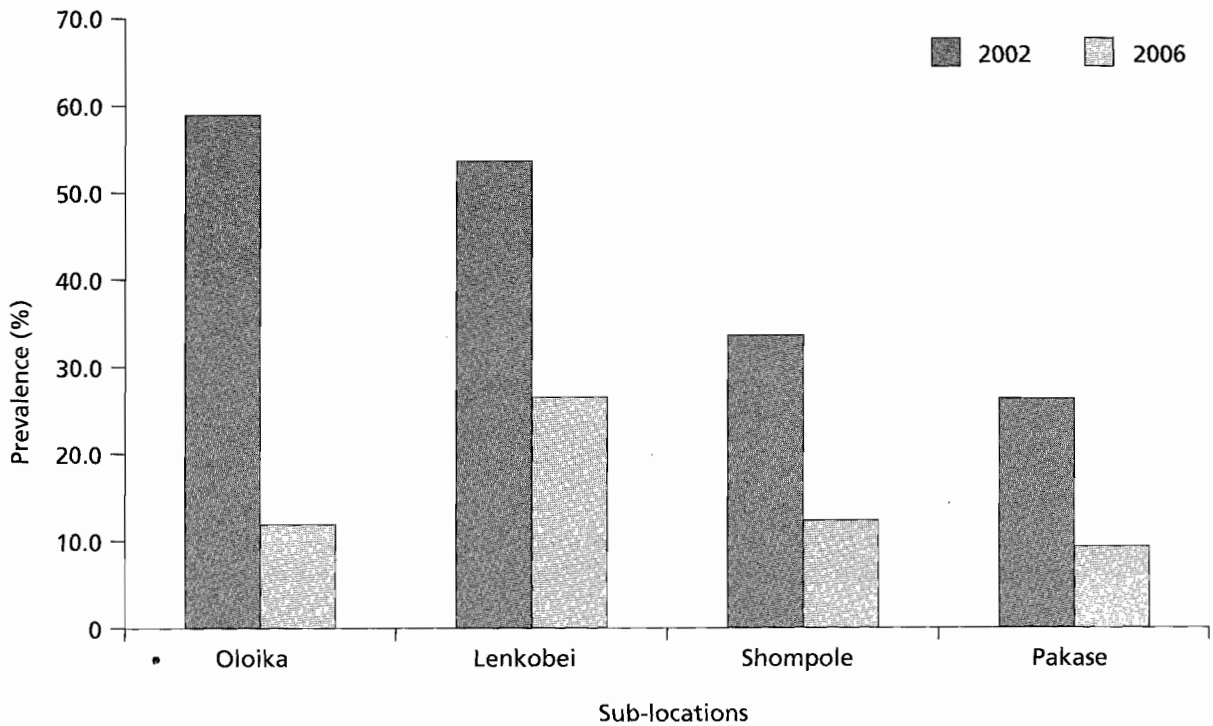


Figure 2

Shompole location: trend of active trachoma (TF) by sub-location



"...We know the amount of trachoma has really gone down but; because you are the specialists and you have personally come to confirm it, let me not pre-empt your findings.., you now have the authority to go into the villages and tell us what you find ..."

- Mr. Joseph Ololkinyei — Chief of Shompole Location- opening the survey workshop.

Table 3

Prevalence of TF by villages

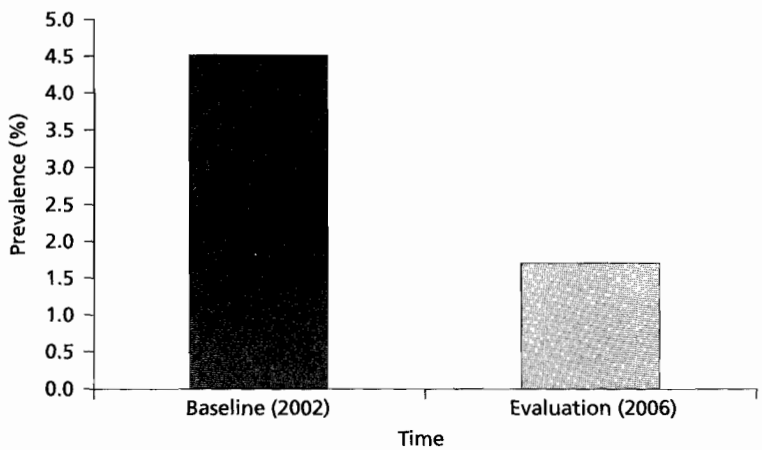
Name of village	Children 1-9 years No. examined	TF	TF prevalence (%)	95% CI
Oaloika sub-location				
Esoit Narok	30	0	0	
Olorishi	72	9	12.5	2.5 – 37.7
Entaamo	93	15	16.1	5.1 – 38.0
Oltaret	70	9	12.9	2.6 – 38.5
Oloika/Olosaen	87	9	10.3	2.1 – 32.3
Lenkobei sub-location				
Nkutukie-Olang'at	100	36	36.0	18.7 – 57.4
Lenkobei	61	7	11.5	1.7 – 39.3
Shompole sub-location				
Endonyo Lasho	71	7	9.9	1.5 – 34.8
Elangatawuas	68	18	26.5	9.6 – 53.1
Shompole	88	4	4.5	0.2 – 24.9
Langeruani	53	5	9.4	0.8 – 39.5
Pakase sub-location				
Upper Pakase	116	11	9.5	2.3 – 27.4
Lower Pakase	89	8	8.9	1.6 – 30.3
Total	998	138	13.8	9.9 – 18.9

"... In the last three months, there are families who have migrated into Shompole from Kajiado South and from Tanzania. Some have been away for up to three years but had to come back home because of conflict over pastures. That is why you have found that there are some villages with higher levels of active trachoma and children who are not immunised.. . They did not receive Zithromax... We are tracking them down and will treat them .... working as a trachoma monitor makes my work as an assistant chief very easy..."

- Mr. Stephen Lemayian — Assistant Chief/Trachoma monitor, Oloika

Figure 3

Households with at least one child with more than five flies on the face

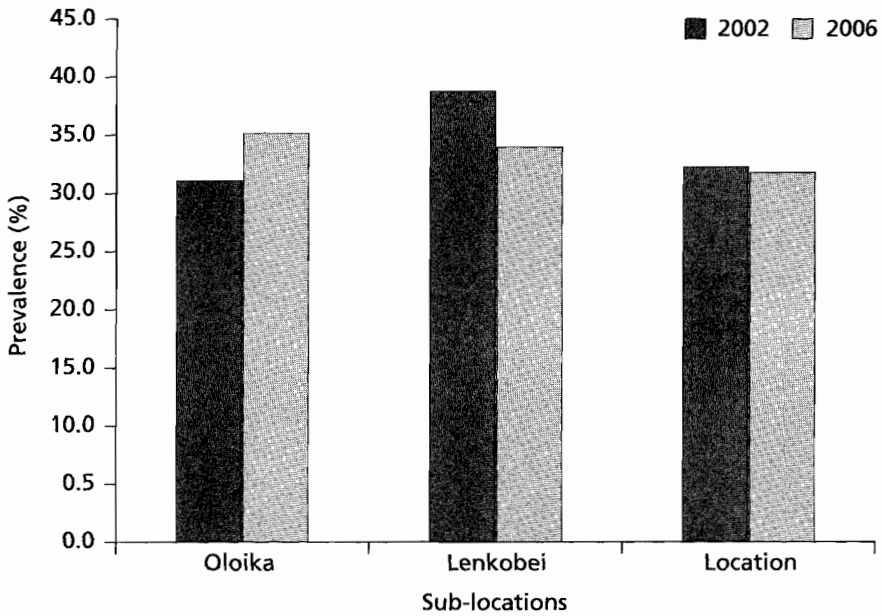


* Children with many flies on the face had more TF than those without: p = 0.000

* Fly density changes with seasons. This end term evaluation was conducted in the dry season. It started raining soon after the 2006 baseline survey commenced.

Figure 4

Trend of percentage households with children with dirty faces by sub-locations



The 2002 data for two of the sub-locations was not available.

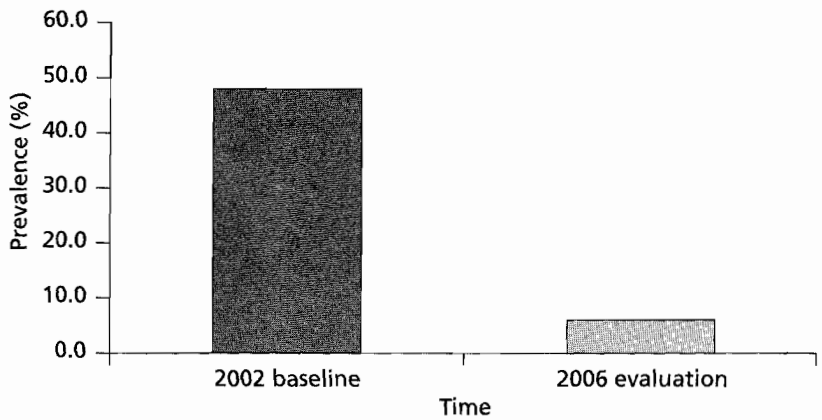
Of the 898 adults aged ≥15 years examined, 15 had TT. Prevalence of TT in the age group was 1.7% (95% CI: 0.8%-3.4%). All those with TT had CO.

... The people remaining with TT in Shompole are those who have completely refused to be operated ... We have talked with them many times and they have said NO! what can we do?...."

-Mr. Isaac Lepilal, Trachoma Health Monitor, Shompole/Olkiramatian.

Figure 5

Shompole trachoma project: trend of blinding trachoma (TT)



TT prevalence in males dropped from 4.3% in 2002 to 0.9% in 2006 while in women it dropped from 5.3% to 2.0% in the same time period. Of the 48 TT operations done in the location in 2005, 36 were done on women.

... Oloputet (tweezers) is no longer in use ... enkare (TT) is not common ... it seems as if in the coming two years or so, it (oloputet) will no longer be known by the children in this community ..."

- Comment at Lenkobie community FGD

Other findings:

(i) Surgical targets were achieved and exceeded. Out of the 15 cases of TT reported, in the survey only two (13%) were recurrences.
(ii) Annual mass antibiotic (Zithromax) distribution was done in 2004 and 2005 with over 80% response rates.
(iii) The project has trained a large number (270) of dedicated volunteer community health workers.
(iv) There are school health clubs actively involved in trachoma work.
(v) Use of pit latrines and household hygiene is very low.
(vi) Government, AMREF and Magadi Soda are assisting with water provision but it is still not easily available to all.

DISCUSSION

Trachoma is "one of the forgotten focal tropical infectious diseases" and the leading cause of preventable blindness contributing to estimated 5.9 million blind people globally. Kenya is one of the endemic countries. If the risk factors which promote transmission are removed, the disease would be eradicated with time (1,2,10,11).

The AMREF sponsored Shompole trachoma control project served as a national and regional SAFE model, implemented in line with the WHO adopted GET 2020 guidelines. The close collaboration between AMREF, MOH, UON and SSI among others has strengthened partnership in eye care and offered joint research opportunities in the field of community eye health. The Shompole community perception and emotions expressed during the FGDs clearly indicated that the beneficiaries are very grateful and appreciate the seriousness, reliability and enthusiasm displayed by AMREF and partners in ensuring that blinding trachoma is eradicated from Shompole. Respondents at all FGDs (including children) had adequate knowledge on trachoma and its control but like it has been found in other studies, positive behavioural change takes a long time (12).

The project has achieved and exceeded its SAFE objectives for "SA". Those for "FE" are partially achieved due to high implementation costs and negative cultural believes. The prevalence of TF in children has reduced from 46.4% in 2002 to 16.0% in 2006 (Figure 1, 2) and that of TT in adults from 4.5% to 1.7% (Figure 3). The target was to reduce the prevalence of TT and TF by 50% by 2005. At the time of the evaluation (dry season), the project area was experiencing continuous in-migrations from the neighbouring trachoma endemic communities. Villages at the borders like Nkutukie Olang'at, Elangatawuas and Entaamo were most affected. This justifies the need to upgrade the project to cover the whole district and beyond if possible.

Out of the 15 cases of TT reported, only two (13%) were recurrences indicating that the surgical outcomes are good compared with the recurrence rates reported in other parts of Africa (13,14). The patients remaining with unoperated TT are already visually impaired. They are known by the community workers but they have completely refused to be operated on.

As had been reported in two previous studies, the prevalence of active trachoma (TF) in Shompole/Kajiado was again found to be higher in boys than girls, $p = 0.044$. This is against what is expected since it is the girls who are in close contact with children (reservoir of active trachoma) for longer durations than boys. This finding needs further investigation (1,2,5,15).

The proportion of children with clean faces has not changed from 2003 but the proportion of children with many (>5) flies has drastically reduced from 48.0% in 2002 to 6.0% in 2006. It is difficult to define a dirty face and the degree of dirtiness which is critical for trachoma transmission. Fly density changes with seasons. This end term evaluation was conducted in the dry season while, it started raining soon after the baseline survey commenced. May be the health promotion strategy and available materials (lesso and leaky tin) are not adequate in impacting behavioural change. The community holds strong negative believes about pit latrines. Hard and rocky ground plus frequent migrations make it difficult to construct and maintain them. Where the soil is sandy, the pit latrines collapse more easily. Even though all the respondents were aware of the benefits of using pit latrines and the alternative "cat method", 91.6% said they still go to the bush and leave the faeces uncovered. This persistently low utilisation of pit latrines and high percentage of children with dirty faces calls for a review of the project's health promotion strategies.

Implementation of SAFE cannot succeed without water (16). The main sources of water in Shompole

in the dry season are rivers/streams (51.2% of households) and water pipes (46.4%). During the rain season, dams also become an important source of water. According to AMREF, boreholes are not advisable because of high salinity in the area. Concrete water jars have been replaced with plastic water tanks because the tanks are easier to carry around (nomadic community). Weak community water management structures are a major handicap being tackled by AMREF.

There are vibrant school health clubs in the two primary schools in Shompole whose children are actively involved in promoting SAFE. Children are important agents of change.

In Shompole, like in several other endemic communities of Africa, women have been found to have more TT than men (2,15). Likewise, majority of the TT surgery beneficiaries in AMREF returns are women. Most of the volunteer village health workers are also women. All the trachoma monitors and most of the community leaders interviewed were men who are very supportive to the volunteer workers.

The strength of the project lies in the proper planning, strong commitment by partners like SSI and Magadi Soda, involvement of local communities and close links with government programmes like Primary Health Care and School Health Programme.

Based on information gathered from the FGDs and key informants in interviews, the sustainability of the components of SAFE varies. "S" is sustainable because the MOH has the capacity to continue with TT surgery. The only concern is the cost sharing charged at the government hospitals. The community and the Government cannot sustain "A" without the support from development partners. The azithromycin is donated by Pfizer Inc. USA through ITI. However, since the prevalence of active trachoma is sharply declining after the initial two mass distributions, sustaining the antibiotics support will not be a concern in the near future. It has been found that even one mass treatment with high participation rate may be adequate (11). "F and E" components are expensive and therefore require multi-sectoral and long-term strategies. The F and E interventions however are sustainable because of the community, MOH and Ministry of Education (MOE) involvement and ownership. AMREF, Magadi Soda and SSI are already investing resources towards the expansion of community water resources and strengthening of community management structures as part of SAFE. Training and supervision of the integrated Volunteer Community Health Workers (VCHW) is sustainable because it is in line with the new Government of Kenya Essential Health Parkage (KEPH) in the MOH National Health Sector Strategic Plan II: *Reversing the Trends* (2005-2010). They (VCHW) can be effectively supervised by the MOH public health technicians and community nurses who have been trained on trachoma control. This AMREF supported project is leading in the implementation of the new MOH plan. Mechanisms for Government takeover of the VCHW training and supervision should be planned in advance. There are minimal costs involved since VCHW are not salaried staff and the MOH already has public health technicians and community nurses.

The main challenges ahead are how to provide enough safe water to all, how to effectively impact behavioral change and the expansion/rolling over of the project to the other endemic communities in Kenya and the region.

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