

## WORLD VIEW

# Uptake of trichiasis surgical services in Tanzania through two village-based approaches

Michael Mahande, Manisha Tharaney, Edward Kirumbi, Edith Ngirawamungu, Robert Geneau, Lisa Tapert, Paul Courtright

*Br J Ophthalmol* 2007;**91**:139–142. doi: 10.1136/bjo.2006.103374

See end of article for authors' affiliations

Correspondence to:  
Dr Paul Courtright,  
Kilimanjaro Centre for  
Community Ophthalmology,  
Tumaini University, PO Box  
2254, Moshi, Tanzania;  
pcourtright@kcco.net

Accepted 4 October 2006  
Published Online First  
18 October 2006

**Aim:** To determine the effectiveness of village-based strategies (using school teachers and village leaders) to increase the use of surgical services.

**Methods:** A cohort study was conducted in Tanzania using two village strategies (village leader and school teachers); trichiasis surgical uptake and the factors associated with uptake were measured after 1 year.

**Results:** The trichiasis surgical coverage at baseline was 16.9%; 200 patients who needed surgery were identified. One year later, we were able to re-examine and interview 163 of these patients. The surgical uptake among these patients was 44.8% (95% CI 37.2% to 52.4%). Patients in the school-teacher programme had a 36.5% uptake compared with 52.1% for those in the village-leader programme. No difference was observed in uptake by age or sex. Uptake was highest among those coming from multiple-generation households and those with more household wealth. Of the 90 people who still had not had surgery, 20 (22.2%) reported seeking surgery, but failing to receive it because of barriers at the provider side.

**Conclusions:** Improved surgical uptake for trachomatous trichiasis was achieved by using village-based promotion efforts and surgical services at existing health clinics. Even with free surgery at health clinics, indirect costs and social support barriers limit utilisation by the most vulnerable, the poorest and those living in single-generation households. Problems at the provider level also create barriers for patients who need surgery.

Trachomatous trichiasis remains a major cause of blindness worldwide, even with the expansion of trachoma-control programmes. The long time period between active disease and subsequent trichiasis probably means that trichiasis surgery will be required long after control of the active disease has been achieved. Trichiasis surgical coverage rates (defined as the number of patients who have had surgery divided by the total of those with trichiasis and those who have had surgery), reported at 18% (women only),<sup>1</sup> 35% (women only),<sup>2</sup> 44%<sup>3</sup> and up to 66%,<sup>4</sup> suggest low or incomplete coverage rates, particularly in sub-Saharan Africa. The fact that women account for at least two thirds of the trachoma blind in the world<sup>5–6</sup> suggest that approaches to providing services need to be gender sensitive. Currently, the utilisation of trichiasis surgical services has a sex equity imbalance.<sup>3,7</sup>

The reasons for the low utilisation of the existing surgical services is not fully understood, and there is considerable variation between areas based on local conditions and cultural practices. Although there is no charge for surgery, studies in Malawi, Ethiopia and Tanzania have reported that indirect costs, such as time away from home and the need for a companion to travel with, pose barriers for those who need trichiasis surgery.<sup>2,8,9</sup> The highest rates of uptake have been described in the Gambia when surgery was provided at the village level.<sup>4</sup> Village-based surgery has not been widely adopted in much of Africa, primarily because of the cost (financial and human resources) of going from village to village to provide surgery. Trichiasis is expected to remain a public health problem in communities endemic for trachoma for at least another 20 years; periodic visits to villages could be prohibitively expensive. Health facility-based surgery is likely to be of higher quality, owing to standardised procedures and better sterilisation techniques, and is likely to be better integrated into general healthcare and eye-care services.

We compared the effectiveness of two village-based approaches to improving the utilisation of services. We

compared two strategies designed to raise awareness and improve access and acceptance in the villages. Surgery was provided at the health centre level (roughly, 10 villages are served by one health centre). We wanted to determine which strategy was better at improving uptake and which factors predicted a failure to accept surgery.

## METHODS

This was a prospective cohort study. Two village-based promotion strategies were implemented, and the uptake of trichiasis surgery and the factors associated with uptake were measured after 1 year.

The study was undertaken in three different regions of Tanzania. In all, 12 villages were selected in the Hai district of Kilimanjaro region, 6 in the Monduli district of Arusha region and 15 in the Singida rural district of Singida region. The villages were selected because trachoma was considered a public health problem by the local health staff. At the time, these villages were not part of existing trachoma-control activities in the country, although the Singida villages were selected to be part of a programme to train school teachers in trachoma prevention. As trichiasis surgical promotion requires surgery to be available, only villages with surgical services within 1 hour's walk were selected. In all areas, in accordance with Ministry of Health policy, trichiasis surgery is provided free of charge to the patient.

Before the start of the study, a training session was conducted to ensure comparability of examination results between the examiners (ophthalmology residents and ophthalmic nurses) and to train interviewers (a separate cadre) in standard techniques. After training, village health workers enumerated all people in their respective villages and invited those >40 years of age for examination at a central place on a specific date. Examinations for trichiasis were performed with 2.5× loupes and torches. Centralised screening was carried out as much as

possible; however, residents who failed to show up for screening were traced to their household and requested to come to the examination site on a follow-up date. All people, regardless of the presence of current trichiasis, were asked if they had had trichiasis surgery in the past. Patients with trichiasis (defined as one or more lashes touching the eye or evidence of epilation, whether there was any history of surgery or not) underwent a brief interview regarding sociodemographic status, household composition and their reasons for not having surgery (or, repeat surgery, if appropriate), and enrolled in the study.

Villages in Hai district (Kilimanjaro region) and Monduli district (Arusha region) were allocated randomly to a programme focused on promotion either through school teachers or through village leaders. All 15 villages in Singida were pre-allocated to the school-teacher promotion programme.

School teachers were chosen for training because previous work by Hellen Keller International, New York, USA, had suggested that they may be effective agents of change within communities. The 3-day school-teacher training programme was a collaborative effort using the Helen Keller International programme, adapted to include more information on trichiasis, cataract, gender issues in eye diseases, reasons why people do not use existing facilities, and cataract-related visual problems. School teachers (equal number of men and women) were encouraged to work with village leaders and others to identify resources to support promotion and transport for patients needing surgery. The school-teacher promotion programme focused on the recognition of trichiasis and cataract as a cause of blindness, and the need for early intervention. For supervision, project staff visited the school teachers twice during the year.

Village leaders (primarily men) in villages, selected for promotion by leaders, were trained to help educate residents (particularly women) in the village about the availability, effectiveness and acceptability of trichiasis surgery. Village leaders were also visited twice during the year by field staff to discuss the problem of trichiasis and surgical intervention. To ensure that trichiasis surgery was integrated with other work related to the prevention of blindness, these discussions also included promotion of cataract surgery. The focus was on building trust in surgery, improving social support for those seeking surgery, and encouraging sustained community involvement in recognition and referral of trichiasis cases.

Individuals enrolled in the study were traced 1 year after the initiation of the promotion programmes and re-examined. Follow-up was conducted by a trained examiner and an interviewer (different from baseline). Interviews were also carried out to assess reasons for not accepting surgery. Trichiasis surgery uptake (95% confidence intervals (CIs)) was measured for those who needed surgery at baseline.  $\chi^2$  and relative risks were calculated to assess the contribution of specific predictors to uptake.

Ethical approval was provided by the Tumaini University, Moshi, Tanzania, and informed oral consent was obtained from patients before examination and interview.

## RESULTS

Of the 225 trichiasis cases identified at baseline, 79 were from Hai district, 74 from Monduli district and 72 from Singida rural district. Of these, a total of 38 patients with trichiasis had undergone surgery and 13 of these had recurrent trichiasis, leaving a study population of 200 patients in need of surgery (includes 13 recurrent cases).

Twelve months after the promotional interventions, the 200 patients with trichiasis were traced for examination and interview. Of these, 163 were examined and interviewed; 4 had died, 4 had moved elsewhere or were on "safari", 4 were found to have had no trichiasis and 25 could not be found.

There was no difference in age, sex or district between those individuals who were examined and those who were not examined.

In all, 73 patients (44.8%; 95% CI 37.2% to 52.4%) had undergone surgery. Although the overall uptake was the same for women as for men, uptake among Masai women (42.9%) was higher than among Masai men (26.3%), and was higher among non-Masai men (58.5%) than among non-Masai women (51.2%; table 1).

We detected differences in uptake between villages ( $p < 0.003$ ), but not according to district. The structure of the household was also predictive of uptake; there was a trend for patients with trichiasis coming from households with multiple generations to be more likely to have surgery compared with people from single-generation households ( $\chi^2$  (trend) = 5.5;  $p = 0.02$ ). Stratified by sex, this association held for women (RR = 1.72, 95% CI 1.23 to 2.42) rather than for men (RR = 0.55, 95% CI 0.24 to 1.28). Individuals with bilateral trichiasis were 1.8 times (95% CI 1.2% to 2.7%) more likely to have surgery than those with unilateral trichiasis. Age and baseline visual acuity were not associated with the uptake.

Villages that were served by the school teacher programme had a 36.5% uptake compared with 52.1% for the village-leader programme (RR = 1.4, 95% CI 0.9 to 2.1;  $p = 0.06$ ; table 2). Women in villages with the village-leader programme were slightly more likely to accept surgery than women in villages with the school-teacher programme.

Of those who had not had trichiasis surgery, 20/90 (22.2%) reported that they had gone to the health centre for surgery but did not receive the operation. In eight cases, the surgeon was not present at the time of visit; in 10 cases, the surgeon turned them away, with no reason given; and in two cases, the surgeon said that he lacked essential surgical equipment or supplies. These 20 patients reported that they had lost hope and would not return for surgery.

## DISCUSSION

In these three relatively different and dispersed locations in Tanzania, uptake of trichiasis surgery was substantially improved by village-based promotion. The inputs necessary to achieve this increase included costs of training village leaders or school teachers (and periodic follow-up), and training and equipping trichiasis surgeons. As surgeries were not performed in the individual villages, there were no costs incurred for transport of the medical team or allowances for outreach.

Surgery performed in the villages, as shown by research carried out in The Gambia,<sup>4</sup> might be expected to increase the utilisation of surgical services further; however, the cost associated with transport and allowances limit the application of this practice to only a few select areas. Village leaders and school teachers may be appropriate choices for promoting surgical intervention in rural settings endemic for trachoma, as both groups have a level of credibility (because of age, educational attainment and status in the communities) that is often lacking for village health volunteers (who are generally younger and concentrate on mother and child health issues). The process of identifying individuals who are most likely to influence elderly people (and their families) in rural communities is critical for any effort at improving awareness, access and acceptance.

There are many determinants for surgical uptake, some related to the service providers themselves. The reliability and responsibility of the trichiasis surgeon (being available at the health centre when agreed), quality of service (clinical quality as well as showing respect and compassion towards patients) and availability of surgical supplies are also critical to the success of programmes. We did not measure clinical quality of the surgeons in the study.

**Table 1** Factors predictive of surgical uptake after 1 year

Demographic information	Accepted surgery, n (%) (n = 73)	Did not accept, n (%) (n = 90)	RR (95% CI)
Sex			
Men	15 (44)	20 (57)	0.95 (0.6 to 1.5)
Women	58 (46)	70 (55)	1
Age group (years)			
40-49	3 (42.9)	4 (57.1)	0.91 (0.4 to 2.2)
50-59	13 (41.9)	18 (58.1)	0.89 (0.6 to 1.4)
60-69	24 (46)	28 (54)	0.98 (0.7 to 1.4)
≥70	33(47)	37 (53)	1
Marital status			
Married	43 (47.3)	48 (52.7)	1.7 (0.9 to 3.3)
Not married	7 (28)	18 (72)	1
Household wealth			
Neither bicycle nor radio	48 (49.5)	49 (50.5)	0.9 (0.6 to 1.5)
Either bicycle or radio	6 (33.3)	12 (66.7)	0.6 (0.3 to 1.4)
Both bicycle and radio	10 (52.6)	9 (47.4)	1
District of residence (region)			
Hai (Kilimanjaro)	25 (39.7)	38 (60.3)	0.76 (0.50 to 1.15)
Monduli (Arusha)	25 (44.6)	31 (55.4)	0.85 (0.57 to 1.28)
Singida Rural (Singida)	23 (52.3)	21 (47.7)	1
Ethnic group			
Masai	41 (39.8)	62 (60.2)	0.75 (0.53 to 1.04)
Other	32 (53.3)	28 (46.7)	1
Generational status of households			
Multiple generations	34 (50.7)	33 (49.3)	3.4 (0.6 to 22.1)
Two generations	14 (33.3)	28 (66.7)	2.3 (0.4 to 15.1)
Single generation	1 (14.3)	6 (85.7)	1
Educational attainment			
No education	41 (39.8)	62 (60.2)	0.7 (0.4 to 1.2)
Some education	9 (56.3)	7 (43.8)	1
Occupation			
Farmer/herdsman	48 (42.9)	64 (57.1)	2.1 (0.6 to 7.5)
Others	2 (20)	8 (80)	1
Baseline clinical information			
Visual acuity (best eye presenting)			
Good (6/18+)	33 (45.8)	39 (54.2)	1.11 (0.7 to 1.7)
Visual impairment (6/24-6/60)	21 (46.7)	24 (53.3)	1.13 (0.7 to 1.8)
Blind (<6/60)	19 (41.3)	27 (58.7)	1
Severity of trichiasis			
Minor trichiasis (<5 lashes)	33 (42.9)	44 (57.1)	0.9 (0.6 to 1.2)
Major trichiasis (<5 lashes)	40 (50)	40 (50)	1
Laterality trichiasis			
Bilateral	55 (55.6)	44 (44.4)	1.8 (1.2 to 2.7)
Unilateral	18 (31)	40 (69)	1

Considering village-based and household-based determinants are equally important. The lower uptake among those from single-generation households, and among those currently unmarried and of low educational attainment suggests that there are still vulnerable groups who are not receiving services. Similar to a recent study from Vietnam and Tanzania,<sup>6</sup> we detected no difference in overall 1-year uptake between men and women. Nevertheless, our data suggest that cultural and economical factors may predict whether gender contributes to the use of services in these settings. Although loss of vision was expected as a factor stimulating people to opt for surgery (whether trichiasis or cataract), we did not show any difference in uptake by vision. The variation between villages as well as the variations between men and women according to the intervention type suggests that no single approach is appropriate in every setting. Some villages have strong, supportive leadership whereas others are quite weak or divisive; similarly, leadership within schools vary considerably.

The villages in Singida were pre-selected for the school-teacher programme, resulting in an imperfect randomisation; however, a comparison of findings between randomised village and pre-selected villages did not show any differences in terms of demographic and clinical characteristics.

We did not attempt to carry out this study as a randomised clinical trial by including a group of control villages, finding it ethically unacceptable to randomise some villages to be without some form of community intervention. Our findings comparing the two interventions thus have to be interpreted with caution.

An additional limitation to the interpretation of our findings is the fact that, at baseline, all patients with trichiasis in the selected villages may not have been identified; some may have chosen not to come for assessment. People unwilling to be examined may be those least likely to accept surgery. Our failure to trace 25 patients was primarily because of the fact that these individuals had moved, a common practice for semi-nomadic Masai. Although we found no age or gender differences between those traced and those not traced, it is

**Table 2** Trichiasis surgical uptake after 1 year by programme

Sex	School-teacher programme	Village leader programme
Men	11/23 (47.8%)	4/11 (36.4%)
Women	37/89 (41.6%)	21/37 (56.8%)

possible that those individuals we could not trace may have been less likely to have surgery.

Achieving and maintaining high rates of surgical uptake will require some investment; determining the right mix of investment in communities and in service providers will remain a challenge.

### ACKNOWLEDGEMENTS

We thank the following people for their participation during this study: Dr H Kilima, Dr E Chibuga, Dr J Mwendu, M Temba, Dr Masuki, Sr Kileo and Mr Halfan (all Kilimanjaro Region), Dr AS Swai (Arusha Region), A Shayo (Singida Region) and S Katala and Ms Rose (HKI), and the school teachers and village leaders. Our sincere appreciation also goes to the residents of the village involved in this project.

### Authors' affiliations

Michael Mahande, Robert Geneau, Paul Courtright, Kilimanjaro Centre for Community Ophthalmology, Tumaini University, Moshi, Tanzania

Manisha Tharaney, Lisa Tapert, Helen Keller International, Dar Es Salaam, Tanzania

Edward Kirumbi, Ministry of Health, Dar Es Salaam, Tanzania

Edith Ngirawamungu, International Trachoma Initiative, Dar Es Salaam, Tanzania

Funding: This study was carried out through the generous support of the International Trachoma Initiative and Helen Keller International.

Competing interests: None declared.

### REFERENCES

- West S, Lynch M, Munoz B, et al. Predicting surgical compliance in a cohort of women with trichiasis. *Int Ophthalmol* 1994;**18**:105-9.
- Courtright P. The acceptance of surgery for trichiasis among rural Malawian women. *East Afr Med J* 1994;**71**:803-4.
- Ezz el Arab G, Tawfik N, el Gendy R, et al. The burden of trachoma in the rural Nile Delta of Egypt: a survey of Menofiya governorate. *Br J Ophthalmol* 2001;**85**:1406-10.
- Bowman R, Sey O, Alexander N, et al. Should trichiasis be offered in the village? A community-randomised controlled trial of village vs. community health center-based surgery. *Trop Med Int Health* 2000;**5**:528-33.
- Courtright P, West SK. Contribution of sex-linked biology and gender roles to disparities with trachoma. *Emerg Infect Dis* 2004;**10**:2012-16.
- West S, Nguyen NP, Mkocha H, et al. Gender equity and trichiasis surgery in the Vietnam and Tanzania national trachoma control programme. *Br J Ophthalmol* 2004;**88**:1368-71.
- Evans T, Ransom K. The global burden of trachomatous visual impairment: II Assessing burden. *Int Ophthalmol* 1995;**19**:271-80.
- Olivia MS, Munoz B, Lynch M, et al. Evaluation of barriers to surgical compliance in the treatment of trichiasis. *Int Ophthalmol* 1998;**21**:235-41.
- Melese M, Alemayehu W, Friedlander E, et al. Indirect costs associated with accessing eye care services as barrier to service use in Ethiopia. *Trop Med Int Health* 2003;**9**:426-31.