

Testing a participatory strategy to change hygiene behaviour: face washing in central Tanzania

Matt Lynch¹, Sheila K. West², Beatriz Muñoz¹, Andrew Kayongoya², Hugh R. Taylor³ and B. B. O. Mmbaga⁴
¹Dana Center for Preventive Ophthalmology, Johns Hopkins University, 600 North Wolfe Street, Baltimore, Maryland, 21287, USA; ²Kongwa Trachoma Project, P. O. Box 192, Kongwa, Tanzania; ³Department of Ophthalmology, University of Melbourne, 32 Gisborne Street, East Melbourne, Victoria, Australia; ⁴Dodoma Regional Hospital, P. O. Box 906, Dodoma, Tanzania

Abstract

A participatory strategy to increase face washing was designed and tested in central Tanzania. Changing children's face-washing behaviour is postulated to be important in preventing the transmission of eye disease, particularly blinding trachoma. The strategy used non-formal adult education techniques at neighbourhood level meetings to build a community consensus to keep children's faces clean for the prevention of eye disease. Men, women, schoolchildren, traditional healers and village social groups participated in the intervention. The strategy was evaluated by observing changes in numbers of clean faces of a sample of pre-school children in the village. Clean faces increased from 9% to 33% over the course of a year. Factors which were related to sustained change in children's clean faces included distance to water, age of the child, and presence of a corrugated metal roof. Owning cattle was associated with lack of sustainable change in this population.

Introduction

Trachoma is the leading infectious cause of blindness in the world today, affecting an estimated 500 million people, with 7-9 million blind (DAWSON *et al.*, 1981). The main reservoir of infection for trachoma is pre-school-age children (TAYLOR *et al.*, 1989), and frequent reinfection during childhood is thought to result in blindness later in life (GRAYSTON *et al.*, 1985). Trachoma was once widespread throughout the world but disappeared from many countries before the development of antibiotics, in association with general improvements in sanitation (SCHACHTER & DAWSON, 1981). This indicates that trachoma may be preventable through relatively modest changes in personal hygiene behaviour, offering an opportunity to reduce blindness and improve the quality of people's lives without waiting for general economic development (WEST & TAYLOR, 1988).

In central Tanzania previous surveys have shown that children appeared to be at higher risk of trachoma if their faces were unclean (TAYLOR *et al.*, 1989), and the odds of having trachoma increased if the child's face had both nasal discharge and flies on it (WEST *et al.*, 1991). Flies may play an important role in transmitting trachoma from child to child (BRECHNER *et al.*, 1992). Thus it is postulated that face washing may be a specific hygiene behaviour which might slow the rate of reinfection and prevent blinding trachoma.

The Kongwa Trachoma Project began in 1988 to test this hypothesis. A preliminary research phase identified social and cultural aspects relevant to a strategy to increase face washing. Participatory, non-formal adult education techniques (SRINIVASAN, 1983) were chosen to promote change in hygiene behaviours.

The project staff developed and implemented a strategy in one pilot village which was evaluated for its effectiveness in changing hygiene behaviours. Details of this strategy, its implementation and evaluation are described below. Once the project could demonstrate behaviour change, later stages would evaluate its effects on trachoma disease in a larger field trial.

Intervention strategy

Pilot village

The pilot village was located in a semi-arid area in central Tanzania, 35 km from project headquarters, with a population of 2940 villagers, of whom 942 were pre-school children. There was a functional, deep borehole at

the edge of the village. The village has 4 neighbourhoods (*mtaa*), each with approximately 80 households. The village was selected because it was a reasonable distance from project headquarters, facilitating the logistics and was known from a 1986 survey to have a high prevalence of trachoma, with 73% of pre-school children affected.

Strategy development

In our preliminary research we found that face washing decisions involved a network of community members. For this reason we decided not to target women or women's groups alone (MCCAULEY *et al.*, 1992). Both men and women were encouraged to attend the neighbourhood level meetings; men had expressed reservations about meetings to which they were not invited. The men's approval was needed for women to divert time and energy from their other activities to wash children's faces (MCCAULEY *et al.*, 1990). Other constraints which affected the strategy design included the scarcity of water in the area and women's lack of time to take on additional duties. Thus it was important to involve as many women as possible to encourage sharing the additional work with co-wives and neighbours. Also, women mentioned that by adopting more frequent face washing they might be perceived by others as being vain, or setting themselves apart. Fear of witchcraft is one of a number of cultural and social factors which encourage conformity and the avoidance of behaviour which might cause envy by co-wives or neighbours (BRAIN, 1982). Thus a social marketing approach directed at individual mothers as the main caretakers of young children would probably have been ineffective due to social barriers constraining change in individuals (BRIEGER & RAMAKRISHNA, 1987).

Strategy description

To change personal hygiene behaviours the team had first to learn how to engage villagers emotionally and intellectually in the problem, linking it to their daily lives. The villagers had to analyse the problem and develop a plan of action to implement. Finally, the changed behaviours would need reinforcement.

The intervention strategy consisted of 3 phases: community analysis, neighbourhood level meetings, and reinforcement activities (Table 1).

Our strategy stressed developing a community consensus on improving hygiene with the participation of all community members who may influence the face washing decision. Women chose to adopt more frequent face washing during a public meeting in which their neighbours, husbands, and co-wives did the same. Older children, particularly girls, were active in the care of younger children and were involved through a school

Address for offprint requests and correspondence: Dr Sheila West, Dana Center for Preventive Ophthalmology, The Wilmer Eye Institute, Room 116, The Johns Hopkins Hospital, Baltimore, MD 21287-9019, U.S.A.

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Table 1. Strategy implementation process

Preparation	
Training:	facilitation skills, group dynamics, adult education techniques.
Mobilizing leaders:	seminar to clarify expectations, plan co-operation.
Strategy components	
Community analysis:	introductions, identify key issues.
Meeting no. 1:	problems and causes identified.
Meeting no. 2:	feasible hygiene plan selected.
Meeting no. 3:	evaluate progress, select long-term plan.
Reinforcement:	treatment of existing cases, school programme, seminar with traditional healers.
Subsequent meetings:	reinforce hygiene plans, continued support for long-term plan.

programme. Schoolchildren created songs, dramatic sketches, and poems which they performed for the whole village. Traditional healers, who provided a large share of health services, were also involved through seminars in which their support for face washing was elicited.

Implementation

The implementation process required about 3 months. Each step is summarized below.

Selection and training of facilitators. Four women and 4 men with at least primary school education were selected from the Kongwa area to serve as facilitators although none had previous experience in leading discussions. An interview process was designed to select candidates with confident manners, good speaking ability and respect for villagers.

All team members participated in a 5 d workshop with a 'training of trainers' format (HOPE & TIMMEL, 1984) to develop skills in facilitating lively small group discussions. Particularly helpful training exercises graphically illustrated the flow of discussion, pointing out traits such as reticence to speak or tendency to dominate. The team also learned to use sketches to present succinctly problems identified by the community in a way which would provoke discussion and analysis.

Mobilizing support from village leaders. The support of village leaders was important to ensure that villagers heard about scheduled meetings and were encouraged to attend. A seminar was held with village leaders to discuss health and eye problems, to illustrate methods used in the strategy, and to build co-operation between leaders and the project team. This seminar clarified expectations of what the project could and could not do in the village, as well as demonstrating how the first 2 meetings would identify community problems and their causes. Community leaders and facilitators working in small groups produced a schedule for neighbourhood meetings and clearly identified respective tasks and responsibilities.

Community analysis. During community analysis the team developed an understanding of important issues in the village and a working relationship with villagers. The facilitators gathered information on key issues, such as perceptions of eye and health problems, and past development efforts, both successes and failures. Issues which they heard people discuss with particular emphasis or emotion were noted and checked with other team members. This information was then used to create a sketch which reflected back to the community an issue of importance as a means of engaging the villagers' interest and galvanizing discussion. For example, in this village a key issue was the lack of drugs to treat common ailments. Therefore, team members opened the first meeting in the series by acting out a situation in which a mother was unable to find appropriate drugs for her sick child.

Neighbourhood meetings. The neighbourhood meetings were designed to create a process in which villagers identified problems and their causes, evaluated the feasibility of various plans to address problems in the context of the village's current capabilities, selected a plan and modified it in the light of initial experience. A series of 3 meetings held at intervals of approximately one week was needed for this process.

The first meeting opened with the sketch described above, after which men and women separated into small discussion groups, as women in this area were reluctant to speak freely in the presence of men. Using the sketch to initiate discussion, the groups named important problems; each was listed on newsprint. It was important that each person's contribution was treated equally, with all ideas listed. In this way illiterate and less powerful people's ideas were given equal value in the discussion group.

Once the problems were listed, the group returned to the list to discuss and then record the causes of each problem. At this time the facilitator checked opinions with the group before recording them on a flip-chart, allowing the group to clarify and reach a consensus on the causes of the problems. Irrelevant or less important problems could then be dropped by the groups. Eye problems were consistently among the top 5 health problems listed, and villagers in each neighbourhood identified flies and unclean faces as causes of eye disease. For intervention purposes, this identification of eye diseases as a village priority was a key first step.

The second meeting focused on selecting feasible plans for addressing health problems identified in the first meeting. Another sketch was performed, emphasizing the value of prevention. The team leader reviewed the work of the previous meeting, and made a distinction between 2 types of plans, a 'quick' plan which could be implemented immediately with resources currently available, and a 'difficult' plan which would be longer-range and require additional resources. He explained that beginning with the quick plan would strengthen future work on the difficult plan by involving people immediately in concrete co-operative action. The meeting then split into discussion groups to discuss options for quick plans. Face washing was chosen in each neighbourhood because it was the only plan possible for each family to start implementing immediately, required no additional outside resources, and directly addressed the identified cause of a priority health problem.

The most commonly named constraint on increased face washing, lack of water, was addressed through a demonstration showing how as many as 30 people can wash their faces from a small gourd of water (WEST & LYNCH, 1990). This changed the perception that a lot of water was needed for face washing, making the plan feasible for women to implement with current water availability.

Villagers requested treatment of currently infected eyes as part of their prevention plan and the project contributed by providing ointment. This face washing and treatment plan was then publicly agreed upon by all participants at the end of the meeting.

At the third meeting mothers in small discussion groups shared difficulties they had experienced in implementing more frequent face washing: lack of water at the house in the morning, cold air in the morning, no support from men in the household, and the mother having to leave to get firewood or water before the children woke. In each case, other women in the group were able to give ideas from their own experience on how to overcome these problems.

Once the difficulties had been discussed and the solutions found, the groups went on to discuss ideas for longer range plans. In some neighbourhoods this required a fourth meeting and, once each neighbourhood had expressed its opinions, a meeting of the full village was called to choose a long-term plan for the whole vil-

lage. In this village the plan was to establish a store which could sell common drugs. In each meeting subsequently held to organize this, team members recalled the face washing plan and progress was discussed, but the primary focus had changed to the village's long-range plan. This was in keeping with experience elsewhere, where community organization around trachoma as an issue was sustainable only if the organization also addressed other key village issues (SUTTER & BALLARD, 1983).

Reinforcement

Once a neighbourhood consensus had been reached to increase face washing, the facilitators began additional activities to reinforce it. A school programme raised students' awareness of facial cleanliness, and a seminar encouraged traditional healers to incorporate face washing into their treatments. The local traditional dance group created songs about trachoma and face washing. These were performed for the entire village at the same time the schoolchildren presented their sketches, songs, and drawings about face washing and trachoma.

The intervention process from community analysis to reinforcement activities took about 3 months to implement, including identification of trachoma cases and a treatment campaign. Evaluation of the intervention was based on data collected to monitor behaviour change and is described below.

Evaluation

Methods. A house-to-house census was conducted in June 1989 and a random sample made of approximately 70 households in each neighbourhood. One pre-school-age child was randomly selected from each household in the sample to be the 'index' child, with 264 enrolled in the study at the baseline.

Three women from Kongwa were trained as observers and interviewers. An interviewer visited each selected household to collect information on distance to water, maternal education, cattle raising, house type, and religion. At the same time she was introduced to each child and carefully observed the selected 'index' child for the following 3 signs of an unclean face: nasal discharge, 'sleep' secretion in the eyes, and flies on the face. The observations were recorded on each of 2 consecutive days. Previous work has shown good reliability in grading signs of a clean face (WEST *et al.*, 1991).

An objective measure of face washing was also developed. A small half-inch (1.25 cm) diameter circle of cream, water-miscible and not requiring soap for removal (Kimberlon, Inc.), was applied by the interviewer to the child's forehead. The cream when dry was almost invisible but contained fluorescent particles which glowed under ultraviolet A lamps (Zelco Industries, Inc.). Glowing particles at the site of application, 24 h later, indicated that no face washing had occurred since the previous day. Observations with the fluorescence test were made at baseline, and at 4 months, 6 months and 1 year after the start of the intervention strategy. Observations alone were made at 2 months. 1% tetracycline ointment was provided for all children suffering from severe, inflammatory trachoma during the observation surveys, as well as treatment free of charge for any villager suffering from minor illness.

Analyses. 'Clean' faces were defined as having no sign observed on either day or only one sign on one of the 2 d. A child with a sustained clean face was defined as one who had been observed 'clean' in 2 of the 3 interim surveys as well as at the one-year survey. Contingency table analyses were performed to describe associations of clean faces with household and individual characteristics of the children. Logistic regression analysis was used to identify independent predictors of sustained clean faces.

Results

During the course of a year, 14 children were lost to

follow-up due to travel outside the village lasting more than 2 weeks, 13 died, and 7 migrated, giving an overall 87% complete participation. There was no refusal to participate. Missing observations of flies on the face reduced the number of usable observations at baseline to 229 (87%) of the children sampled.

Baseline characteristics of the village confirmed that the strategy chosen was appropriate. Most (75%) mothers of pre-school children had less than 2 years of education, so use of written materials would have been inappropriate. Fifty-one percent of the households described their religion as 'traditional', so working through church groups would have missed a sizeable component of the village. The necessity of illustrating how little water is needed to wash faces was obvious as 80% of households reported more than 2 h of water collection time. Cattle were owned by 51% of the households, and 11% of houses in the village had corrugated metal ('tin') roofs. Only 9 children had clean faces at baseline, which precluded analysis of predictors of clean faces at baseline, or using clean faces at baseline as a factor predicting sustainability.

The fluorescent cream test was compared to observations of the face made on the second day at baseline and one year (Table 2). The data suggested that the cream

Table 2. Relationship of face washing, indicated by absence of fluorescent cream, to facial cleanliness as determined by observation

Signs*	Baseline observation		After one year	
	No. of children	Cream absent	No. of children	Cream absent
Nasal discharge				
Present	202	37%	125	31%
Absent	54	52%	103	72%
Food on face				
Present	172	37%	43	14%
Absent	84	46%	185	58%
Flies on face				
Present	173	34%	53	36%
Absent	78	54%	175	54%
'Sleep' secretion in eye				
Present	164	40%	65	9%
Absent	92	41%	163	66%

*See text for explanation.

was more likely to be absent when the facial signs were absent, although some children observed to have signs of an unclean face had no evidence of fluorescent cream on their foreheads, indicating that their faces had in fact been washed at least once since the previous day.

Table 3. Children with and without signs of facial uncleanliness*

Survey	No. of children	'Sleep' in eye	Nasal discharge	Signs			Clean
				Food on face	Flies on face		
Baseline	229	23%	10%	17%	12%	4%	
2 months	258	64%	24%	58%	62%	38%	
4 months	249	72%	28%	57%	53%	34%	
6 months	247	76%	55%	82%	84%	62%	
1 year	230	58%	28%	67%	63%	27%	

*See text for explanation; 'clean' is defined as no sign on either day or only one sign on one day.

Facial cleanliness increased substantially from baseline to the end of the first year (Table 3). The proportion of clean faces increased 7-fold from 4% at baseline to 27% at one year. Every facial sign showed improvement over the course of the year. Flies showed a particularly important reduction, with 63% of children with no flies on their faces at 1 year compared to 12% at baseline. Nasal discharge was the most difficult sign to control, with only 28% of children having no nasal discharge present at one year. Observations appeared to give a good indication of normal cleanliness status for the household. Differences in observed facial signs by day of observation were small,

and did not vary in any systematic way from day one to day two.

A logistic regression model was used to describe characteristics of children who had a sustained clean face for one year (Table 4). Children from households closer to water (less than 2 h round-trip) were more likely to have consistently clean faces and children from households with a metal roof were 4 times more likely consistently to have a clean face. Two and 3 years old children were most unlikely to maintain clean faces, with a very low odds ratio of 0.08. Children from households with cattle were less likely to sustain clean faces, although the odds ratio was not significant. Other variables not significant for sustained clean faces were level of maternal education, neighbourhood, and 'traditional' religious beliefs.

Table 4. Predictors of sustained clean faces

Characteristic	Percentage at baseline	Odds ratio*
Time collecting water <2 h	17	3.79 (1.47-9.80)
Age 2 or 3 years	27	0.08 (0.01-0.59)
Metal roof on house	11	4.58 (1.51-13.87)
Own cattle	51	0.45 (0.19-1.09)

*95% confidence interval in parentheses.

Discussion

The participatory approach used in this pilot intervention proved to be effective in modifying face washing behaviour. It was also very flexible, allowing for adjustment to local conditions and priorities and appealing to households across the socioeconomic range. The strategy drew its strength from the use of small discussion groups led by trained facilitators which developed both an individual consciousness of the problem and a community consensus on how to address it. The logical analysis of the problem, its causes and possible solutions, developed a decision making process which involved those who would implement and reinforce the new behaviour. We found the facilitator could draw nearly all the basic health knowledge needed to analyse the problems from the villagers in the group, thus maximizing community input in decision making.

The facilitators in this type of intervention had a key role and facilitators of appropriate sex, with children, had to be selected. Team size needed to be planned carefully to allow for discussion groups of workable size (10-20 people) in neighbourhood meetings. Intensive training was needed to develop the skill level required to facilitate, rather than dominate, group discussion. Following training, a continuing process of feedback was necessary to maintain facilitation skills.

We were able to sustain interest and participation at a higher level than might otherwise have been possible by recognizing the community's interest in other problems. The series of neighbourhood meetings gave community members the opportunity to develop a second plan for addressing another village priority, organizing a drug-store in the village.

Reinforcement was central to the implementation of the strategy and whenever possible was based on personal interaction. Almost daily visits to the village throughout the 3 months intervention period were required for such intense interaction. Further reinforcement was provided by the treatment of existing cases of trachoma with tetracycline ointment. Treatment was strongly requested by villagers early in the process and was likely to have been a key item in gaining the villagers' confidence. It is unlikely that this strategy could have been successfully implemented without some treatment component.

The evaluation suggests that face-washing practices did improve over the course of the project. The one-year observations showed an increase in clean faces and a decrease in children with flies on their faces compared to the baseline survey. This is particularly important if flies are indeed important vectors for transmission of disease.

Further, it appears that more than once-daily face washing may be needed for many children to maintain clean faces. There was moderate correlation between absence of an observed sign of a clean face and absence of the cream. However, about one-third of children had nasal discharge and flies present when observed, despite having no cream, indicating that face-washing had occurred. This was probably due to the sign having reappeared between face-washing and time of observation. Nasal discharge was the most difficult sign to control. In a small series of observations when children's faces were washed at one time in the village, clean faces were maintained by over 80% for at least 4 h and the first sign to return was nasal discharge. At one year, all signs except nasal discharge showed much improvement, so this sign alone was responsible for the lower rates of 'clean' faces after one year. Also, it appeared that the increased consciousness of facial cleanliness may have changed not only the frequency of face washing but also the thoroughness with which faces were washed. The cream was absent from approximately equal proportions of children with observed sleep secretion present (40%) or absent (41%) at baseline. At one year, however, the presence of cream was much more closely correlated with observations, with 66% of children with observed sleep secretion and cream absent. More efficient washing of the eyes may have accounted for this change, as small particles of sleep secretion may be left on the eyelashes by less thorough washing.

While a 27% level of clean faces may seem low, other behavioural hygiene interventions using similar methods (STANTON & CLEMENS, 1987) have shown a similar level of response. Not all mothers participate, and behaviour changes are apt to be modified by seasonal or environmental changes. Other factors also affected the cleanliness of children's faces. The sharp rise of clean faces to 60% at 6 months may have been due to the start of the rainy season before the survey. Temporary puddles and playing in the rain would be expected to increase the proportion of clean faces. The village water pump broke down mid-way through the one-year survey, accentuating the seasonal shortage of water at that time. This may have reduced the proportion of clean faces at that survey.

The factors which characterized children more likely to have clean faces over a one-year period were shorter distance to water, ages 1 or 4 to 7 years, and the presence of metal roofs on their houses. These findings may suggest that women with fewer physical, economic or time constraints were more able to sustain frequent face washing, but it is interesting that the level of maternal education was not related to the ability to sustain face washing. This indicates that the strategy appealed to women regardless of their education, and that there is no requirement for a given level of maternal education in order to implement this strategy.

We believe that the distance to water is likely to be more an indication of the value which women place on water as a scarce commodity rather than a physical distance factor (BAILEY, *et al.*, 1989; WEST *et al.*, 1989). There was no significant difference in sustainability by neighbourhood, which should have shown differences for those neighbourhoods furthest from the water source. Distance to water was estimated by the mothers themselves, and those who perceived that water was far away may have been more reluctant to use it for frequent face washing, regardless of the actual distance on the ground. However, trachoma prevention programmes may be able to utilize this health education strategy most effectively when combined with interventions that increase women's access to resources, particularly water. There may be a threshold level of access to resources at which hygiene interventions become significantly more feasible for households to implement and sustain. Further research needs to be done to examine the constraints which women in various social and economic subgroups face in sustaining face washing changes.

Children's ages are an important factor. Very young children in this area are normally carried on the mother's back, but 2 and 3 years old children are active close to the ground, and are at high risk of respiratory infections. They are also more likely to require more frequent maternal attention for hygiene than older children who can wash themselves.

The significance of having a metal roof on sustainability is unclear. Only 22 houses had metal roofs. It is possible that these households had higher socioeconomic status, by virtue of being able to afford the metal roofing. Nevertheless, much wealth is put into the traditional sign of wealth, cattle, which was negatively associated with sustainability. Metal roofs and cattle ownership may act as markers for sets of attitudes towards hygiene which need further investigation to be explained more fully. Households with metal roofs may be more open to new ideas, or less afraid of appearing 'better' than their neighbours.

Ideally, with more time, the development of a village association or institution that could adopt and carry on the reinforcement process would be a high priority. Women's groups offer one possibility of sustaining the reinforcement process over a longer period in areas where such groups exist or can be successfully formed. In the course of our preliminary ethnographic studies we found serious obstacles to the formation of women's groups in the Kongwa area (MCCAULEY *et al.*, 1992).

This pilot study was designed as the first step in a process of developing, implementing and evaluating the impact of facial cleanliness on trachoma disease. In the pilot village only the capacity to affect face-washing behaviour was evaluated. In the ensuing field trials, the impact on trachoma will be evaluated.

The costs of this pilot work research study were too high to allow reproduction of the project in other areas without external assistance. Our research-driven time schedule dictated high-cost, intensive effort over a short period of time. Further work on refining the strategy and reducing costs needs to be completed, as well as documentation of the effect on disease, before this strategy can be recommended for widespread implementation. However, refinements which increase village participation and progress more slowly (for example, training villagers as facilitators to reduce team expenses), seem likely to increase the effectiveness of the intervention rather than detract from it.

The success of this pilot effort does demonstrate that a participatory strategy can effectively change face washing behaviour for at least a year. Research is continuing in 6 villages of the Kongwa area to determine the impact on trachoma disease of increased face washing, using this strategy.

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