

Creating demand for sanitation and hygiene through Community Health Clubs: A cost-effective intervention in two districts in Zimbabwe

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Abstract

Unless strategies are found to galvanise rural communities and create a demand for sanitation, we cannot achieve the United Nations Millennium Development Goal of halving the 2.4 billion people without sanitation by the year 2015. This study describes an innovative methodology used in Zimbabwe—Community Health Clubs—which significantly changed hygiene behaviour and built rural demand for sanitation. In 1 year in Makoni District, 1244 health promotion sessions were held by 14 trainers, costing an average of US\$0.21 per beneficiary and involving 11,450 club members (68,700 beneficiaries). In Tsholotsho District, 2105 members participated in 182 sessions held by three trainers which cost US\$ 0.55 for each of the 12,630 beneficiaries. Within 2 years, 2400 latrines had been built in Makoni, and in Tsholotsho latrine coverage rose to 43% contrasted to 2% in the control area, with 1200 latrines being built in 18 months. Although Zimbabwe has historically relied on subsidies to stimulate sanitation, this intervention shows how total sanitation could be achievable. The remaining 57% of club members without latrines in Tsholotsho all practised faecal burial, a method previously unknown to them. Club members' hygiene was significantly different ($p < 0.0001$) from a control group across 17 key hygiene practices including hand washing, showing that if a strong community structure is developed and the norms of a community are altered, sanitation and hygiene behaviour are likely to improve. This methodology could be scaled up to contribute to ambitious global targets.

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Introduction

Every 15 s a child dies from diseases largely due to poor water, sanitation and hygiene (WHO, 2000). An authoritative review (Esrey, Potash, Roberts, & Shiff, 1991) found that sanitation can lower the rate of

diarrhoeal diseases by 35% and good home hygiene by 33%, and that these two interventions alone are more effective in reducing diarrhoea than improvements in either water quantity (20%) or water quality (15%). One of the Millennium Development Goals (United Nations, 2002) is to halve, by the year 2015, the number of people who have no sanitation (currently 2.4 billion people, or two fifths of the world's population). This immense task relies not only on substantially scaling-up available funds (Terry & Calaguas, 2003) and using effective technologies, but also on the capacity of the unserved population to respond to this international effort.

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Whilst there is seldom resistance to improving water facilities in the rural areas of developing countries, there is usually less interest in making hygiene improvements and to date sanitation initiatives have attracted little support. It is clear that this demand can only be created if a more subtle strategy is used to persuade the target population of the benefits of safe faecal disposal. Sanitation coverage in sub-Saharan Africa has not kept pace with population increase, but has dropped from 60% in 1990, to 47% in 2000; in Asia it has fared little better (Cairncross, 2003). This trend needs to be reversed by creating a *demand* for sanitation. For this to happen, a proven model for community mobilisation is required that can be rapidly adopted and taken to scale. We document the effectiveness and costs of one such approach, which has been successfully implemented by government staff in two districts of Zimbabwe.

Participatory approaches in Southern Africa

Participatory approaches were first used in the water sector in the 1980s as a means of community mobilisation (Srinivasan, 1990). By the mid-nineties, the local variant in East and Southern Africa known as Participatory Hygiene and Sanitation Transformation (PHAST) was widely acknowledged as good practice (Lidonde, 2000). By 1997 this methodology had become established in Zimbabwe and a 'Toolkit' of visual aids had been developed and distributed throughout the country to 800 Environmental Health Technicians (EHTs) stationed at rural health centres, and 48 out of 57 districts had been introduced to the approach, with an estimated 3800 extension workers trained. In the following few years, although the concept was well known it failed to become translated into well-supported programmes. In all but two districts, although training material had been distributed and district staff were conversant with participatory approaches, they failed to use this in their routine work. The activities were seen as labour-intensive and time-consuming and reliant on trainers with extrovert personalities if they were to be used creatively and with confidence. The lack of dedicated funding was also cited as a constraint. The 5 day training given to field staff was seen as too short, and conventional didactic methods too firmly engrained (United Nations Development Programme/Water and Sanitation Programme—East Africa, 1998). Thus PHAST remained largely an interesting concept rather than an applied programme and by 2001 the regional planners who had launched PHAST were losing interest. After nearly a decade, the PHAST approach had failed to produce empirical evidence of behaviour change as few practical objectives and indicators of change had been adequately monitored to convince donors to continue support.

Aware of the shortcomings of PHAST, but convinced of the ability of participatory approaches to achieve behaviour change through conscientisation (Freire, 1970), a small pilot project was set up by one of us in 1995 to address these issues (Waterkeyn, 1999). PHAST was taken a stage further: the exploratory dynamic of participatory activities was linked to achievable objectives with measurable outcomes. Health promotion became a campaign focused on a dedicated membership promoting inspired leadership rather than using conventional village gatherings controlled by traditional leadership. It also set out to provide indicators and monitoring systems that allowed cost effectiveness to be measured. The concept of a club is in line with traditional values of conformity in rural society (Gelfand, 1984) and builds on a long history of womens' groups developed throughout the colonial period through the missionaries and philanthropic societies, when an archetype of the smart, club-going woman as a pillar of society developed in Zimbabwe (Burke, 1996).

Materials and methods

We measured effectiveness in terms of observable indicators of behaviour change rather than a health outcome, given the unreliability of health outcomes for operational evaluation (Cairncross, 1990). Given the evidence in the literature for the impact of clean water, sanitation and good hygiene practices on diarrhoeal and other diseases (Feachem, 1984; Esrey et al., 1991; Curtis & Cairncross, 2003), in this research we have used proxy indicators of safe practices to quantify effectiveness. To enable comparisons with other interventions, costs per club member are converted into costs per beneficiary on the assumption that the health of the entire family of the member (taken as an average of 6 per household) will benefit from hygiene improvements of the member, particularly if, as the mother, she controls hygiene standards within the home.

Intervention approach

The intervention was designed primarily to develop community cohesion and a 'culture of health' (Waterkeyn, 1999) within the target population, with the aim to create a demand for sanitation and improved hygiene practices within the home. Community cohesion is promoted through the establishment of Community Health Clubs, which are voluntary organisations, open to all ages, levels of education and status, and to men and women, free of charge. The approach seeks first to change norms and beliefs within a group as these are recognised as controlling behaviour. The Community Health Club approach is a long term strategy to enable people to control the *determinants* of health

(International Union on Health Promotion and Education and World Health Organization, 1986). Health can be improved by addressing the underlying *causes* of poor health such as limited information, poverty, and lack of social capital, including organisational capacity within the community to effect sustainable change. The model evaluated here involves two stages. In Stage 1, health education provides the entry point as a means of galvanising and forming a ‘common unity’ within the target population. Stage 2 is in the second year, where knowledge is applied to daily life through ensuring good hygiene, safe water supplies and improved sanitation. This paper evaluates the impact of both stages—health education and its application in improved hygiene and sanitation.

By setting exploratory participatory activities within a structure of a syllabus of health knowledge and fixed hygiene objectives, ‘structured participation’, achieved a more focused group dynamic, which proved popular. The response to a field trial of 60 Community Health Clubs in five wards in Makoni District involving 4813 members (Waterkeyn, 1999) indicated that this strategy could galvanise communities into action. This observation needed to be tested on a larger scale and accordingly a Non Governmental Organisation (NGO) was formed in 1998 to support the Government in extending this approach.

Study area

The Rural Waterpoint Upgrading and Rehabilitation Project began in Gutu and Tsholotsho Districts in 1998 whilst the Makoni Environmental Health Campaign expanded the existing pilot project to most of Makoni District in 1999. (Waterkeyn & Waterkeyn, 2000; Waterkeyn, 2003). By 2000, the NGO supporting the MoHCW had started over 500 Community Health Clubs in Zimbabwe, and the approach was also being replicated in three additional areas by other agencies (Mathew & Makuwe, 1999). In this research we focus on the 297 clubs in Makoni and Tsholotsho Districts, with 13,555 members between them (Table 1).

Tsholotsho District (Population 142,713) is in Matebeleland North Province in southwest Zimbabwe. It is drought-prone, and regularly in need of food relief. It has the highest rate of chronic undernutrition, with stunting occurring in more than 25% of children under three (National AIDS Control Programme, 1998). Being almost entirely settled by the politically marginalised Ndebele, development in this district has lagged behind the rest of the country. As farmland is poor, most men are migrant workers in South Africa. The sanitation coverage rate is one of the lowest in the country, probably much lower than the official estimate of 16% (National Action Committee, 2000), largely because the loose Kalahari sands make latrine construction costly as

Table 1
Comparison of intervention areas: Tsholotsho and Makoni Districts, Zimbabwe 2000

District	Tsholotsho	Makoni	Total
Population	142,713	358,733	501,446
Wards	19	35	54
Intervention wards	3	21	25
Clubs	32	265	297
Members	2105	11,450	13,555
Graduated members	68%	36%	52%
Beneficiaries	12,630	68,700	81,330
No. of health education sessions (1999/2000)	832	3731	4563
Cost HE per beneficiary	US 35c	US 63c	US 63c
EHTs trained/in district	3/15	14/15	17/30
Family wells	0	839	839
Functioning boreholes	286	676	976
Sanitation coverage	16%	24%	20%
Latrines 1999/2000	1200	2400	3,600
Subsidy per latrine	US\$ 15	US\$ 20	US\$17.5

pits must be lined to prevent collapse. There are no shallow wells, and the population relies on 817 deep boreholes, of which 65% are currently estimated to be out of order. The intervention in Tsholotsho was in only three wards, where 32 clubs were formed with 2105 members (hence 12,600 beneficiaries). In 2 years, a total of 832 health promotion sessions were held by three trainers, costing an average of US\$3.35 per member or 35c per beneficiary, including start-up costs (Waterkeyn, 2001). All targets were met with 100 boreholes rehabilitated and 1200 latrines built in 18 months, subsidised at US\$15 each (Zimbabwe A.H.E.A.D., 2000).

Makoni District with a population of 358,733, (1992 census) lies in Manicaland Province in eastern Zimbabwe, along the main road between Macheke and Mutare, settled almost entirely by Shona speakers. In contrast to Tsholotsho, it is readily accessible from the capital, has an effective Rural District Council, and is relatively well developed, having attracted many pilot projects since Independence in 1980. Sanitation coverage is above the official estimate of 24%, which is higher than the national average of 21%, (NAC, 2000) and it has the second highest water supply coverage in the country. As the original field trial for Community Health Clubs took place here in 1995, a few of the original clubs (in five of the 21 wards) are 9 years old. From March 1999 to September 2000, a total of 3731 health promotion sessions were held, costing an average for 2 years of US\$0.63 per beneficiary, for training costs

including start-up expenses (Waterkeyn, 2003). Within this time, 2400 ventilated improved pit (VIP) latrines were built by club members in this district, which were subsidised at US\$20 per household. (Zimbabwe A.H.E.A.D., 2000). By mid 2001, there were 265 health clubs in 21 wards with 11,450 members in total and an estimated 68,700 beneficiaries (Table 1).

Activities in the clubs

The training material used for health promotion consisted of 14 sets of illustrated cards based on observation at village level and pre-tested on illiterate villagers. The different topics were reflected in a ‘membership card’ (Fig. 1a) which provided an outline of the syllabus. Local environmental health technicians (EHTs) were given a 1-week training course on the use of these materials, and the organisation of Community Health Clubs.

Each weekly meeting of health club members focused on one topic, debating common problems, prompted by the participatory PHAST activities. Through repeated interaction a strong and informed leadership, elected by the members, emerged in most clubs before any

implementation (such as latrine construction) took place. All health clubs had executive committees, constitutions and annual elections. Application of knowledge gained was emphasised and ‘homework’ was agreed at every session with members pledging small home improvements and behaviour changes to be effected by the following week (Fig. 1b). These changes included a cover for the drinking water, a ladle to take water, the construction of a garbage pit, a pot/drying rack and a hand washing facility. Home visits between members were arranged to monitor one another’s progress. Each club produced its own health songs which were sung at each session and dramas depicting local health issues were developed for other clubs, visitors and for the schools. Health slogans punctuated each session, reinforcing key messages and providing resolve and focus to the group in a traditional manner. To complete the course of 20 sessions took between 6 and 8 months of weekly attendance.

A ‘Certificate of Full Attendance’ was given to those who had completed *all* topics and an estimated 52% of all members in the two districts achieved this (Table 1). In addition to the promotional Graduation Days, some clubs arranged Inter-Club Competitions with drama and songs, a health quiz, model home competitions, netball and athletics.

Apart from the five pilot wards in Makoni (1995–1997), most health clubs were started in April 1999 and the MoHCW continued sessions until February 2001, when funding ceased. However in many areas EHTs continued to support health clubs and conduct training sessions, and in most wards, health club members continue to meet of their own accord, to discuss and follow up on health issues within their community. In Makoni there are literacy classes, income generating projects such as nutrition gardens, and bee keeping as well as community support for AIDS victims. The approach has become institutionalised and the MoHCW continues to start new health clubs in Makoni.

No.	TOPIC	DATE	SIGNATURE
1	Mapping of Village		
2	Disease Identification		
3	Balanced Diet		
4	Nutrition Plans		
5	Diarrhoea		
6	Salt Sugar Solution		
7	Home Hygiene		
8	Water Sources		
9	Drinking Water		
10	Water Storage		
11	Hand Washing		
12	Bilharzia		
13	Skin and Eye Diseases		
14	Worms		
15	Sanitation Ladder		
16	Sanitation Story : Plans		
17	Malaria		
18	Respiratory Diseases		
19	Tuberculosis		
20	AIDs and STDs		

(a)

No.	TOPIC	A.H.E.A.D. MEMBERSHIP CARD
1	Village map	<input type="checkbox"/> Name: Club: Ward: District: EHT: Date started: Date finished: Graduation date:
2	Health drama and songs	
3	Nutrition garden	
4	Orchard	
5	Protected water	
6	Covered drinking water	
7	ladle to take water	
8	Individual cups	
9	Individual plates	
10	Individual blankets	
11	Mosquito nets	
12	Pot rack	
13	Rubbish pit	
14	Hand washing facility	
15	Safe sanitation	
16	Clean yard	
17	Disease monitoring	
18	Soap making	
19	Immunisation	
20	Wood lot	

(b)

Fig. 1. (a) The membership card; front, showing topics for health sessions. (b) The membership card; reverse, showing recommended practices.

The study

Between August 2000 and March 2001, a survey was conducted to analyse levels of behaviour change within the different intervention areas. A systematic sample of 25 clubs was taken from the NGO’s register of Health Clubs in each district to include clubs from each ward. Each chairperson in every health club has to keep an accurate record of members. They are listed according to their date of joining and their attendance at health sessions recorded weekly. This club register was used as the sampling frame to select 15 members from each club. This was done by selecting three host respondents, which were taken as the 10th, 20th, and 30th member on the club register. To minimise travel time and expense, cluster sampling was used and four neighbours of the

'host' (who belonged to the health club) were visited, given that they were within easy walking distance. In this way 354 members in Tsholotsho and 382 members in Makoni were visited in their homes unannounced for a spot observation.

A control group for each district was purposively selected, with the assistance of the MoHCW, to match the intervention area with regard to demography, cultural practices, levels of sanitation and water coverage. Although both control and intervention had similar exposure to health promotion, the control had no health clubs and was geographically far removed from the health club areas (typically 30–50 km away) to ensure it was largely unaffected by diffusion of health club ideas. A total of 113 respondents were in the control group in Makoni and 59 in Tsholotsho. In control areas, a list of households was made by the headman or councillor in each village and every *n*th member was selected as a respondent.

A baseline household survey that had been used in Tsholotsho and Makoni in 1997 and 1998 was adapted for the study. It included a structured questionnaire to ascertain factual demography, and spot observation of observable indicators. Each home visit took approximately an hour to complete. All compliance indicators were ascertained by informal observation, and nothing was recorded purely on the *report* of good practice by the respondent. For example open faecal disposal was observed by a walk around the bush immediately surrounding each home to check for unburied faeces. The latrine was inspected by a natural request to use this facility. Hand washing was demonstrated by a child in the home who was asked to assist with hand washing. If a hand washing facility was present it was only recorded as used if there was water inside, and the ground below was damp, or had a pot plant that was obviously well watered. Similarly a request for a drink of water would demonstrate whether a ladle was used to draw water and whether the container was well covered. Young children were asked to point out their own cups, and if this was convincing 'individual cups' were marked as positive behaviour. Pot racks were obviously in use if pots were still in place, and rubbish pits were deemed 'well managed' if there were signs of regular burning, and rubbish separation. Thus observed demonstration, preferably by children, or visible evidence on the ground rather than householders' reporting was the method used to ascertain adherence.

Preliminary findings were discussed with MoHCW staff to seek explanations for the differences found between the two districts in terms of levels of adherence to recommended practices. Three years later in April 2004, 20 in-depth interviews were held in 10 wards in Makoni, with two members (from one club in each ward) to verify claims of activities that were ongoing and ascertain the attraction of the health clubs.

Results

Qualitative data

The success of the intervention in terms of community support is reflected in project reports, and anecdotal evidence given by the NGO and MoHCW officials. These indicated that the methodology had strong appeal for rural communities, and that participants enjoyed the sessions which were social events as well as informative and entertaining. This was indicated by large numbers who joined the clubs, which often had over 100 members. With 52% of members attending all 20 meetings (Table 1) and others attending most of them, support was considered by health workers to be high, as it was unusual for people to attend gatherings with such regularity. Health Clubs continued to meet through the rainy season in most areas; this was considered rare as other projects usually close during the busy agricultural season, particularly if there are no material incentives for attendance.

Members gave reasons for this popularity during in-depth interviews. Whilst the most salient need identified was the enjoyment of gaining knowledge, other reasons mentioned were the interest of varied topics, the challenge to complete the full course, the fun of participating in the discussions, the pleasure of socialising and the strong enjoyment of singing, dancing, drama and competitive sport. Their enthusiasm for model home competitions and their sense of achievement in their own home improvement was evident from their answers and although some mentioned their hope for material assistance from the project this was not the primary motive, as they were clear at time of joining that this was not offered. Pleasure in gaining respect from husband and family was also mentioned repeatedly, as was the sense of unity within the community. Members were specific in their self-identification as being more overtly progressive and better organised, as well as having higher living standards and hygiene than their neighbours, specifically as a result of joining the clubs. Reasons given for some not joining the club were that their husbands forbade it, that they had not been well mobilised, lack of interest, laziness and inability to perceive the benefits of joining the club as well as absence from the area, pregnancy and illness.

The ideal of teamwork between men and women has been strongly promoted by the clubs. Men are encouraged to join health clubs even nominally, as unless the husbands and elders support these groups, women may be restricted in their attendance. In resettlement areas where men are farming at home, as many as 40% of active members are men, although in communal areas where men are largely absent women usually account for over 80% of the members. Women interviewed said the clubs had given them confidence to speak in public and

take decisions, and this public acknowledgement elicited respect from their husbands. Many women have risen from obscurity to become strong community leaders and to be employed by the NGO as co-ordinators; in one case, a woman has become a councillor through her efforts within the clubs. In one ward, health clubs formed a lobby to vote out an obstructive councillor and in many areas, health clubs are used as the main organising body in the village.

Attendance and education

At the time of the survey, 30% of the members in Makoni had finished the training more than 1 year previously; 43% had finished over 6 months to 1 year ago, and 27% were still in training. In Tsholotsho, 65% of the members (more than twice as many as Makoni) had finished over a year before, 9% members finished over 6 months to a year before, and 26% were still in training. Of the total number of members in Makoni, 36% had attended the required number of 20 sessions of the programme, whilst in Tsholotsho 68% had attended all the training, giving an average for the two districts of 52% (Table 2).

In Tsholotsho 40% of the members and in Makoni 34% had completed primary school. In addition 12% in Tsholotsho and 23% in Makoni had attended some senior school (Table 2). This indicates that 52% in Tsholotsho and 57% in Makoni are functionally literate,

with the balance who have only a few years schooling assumed to be semi-literate. Very few had attended no school.

Indicators of improved hygiene behaviour

From the wide range of data collected from 736 club members and 172 controls, there were 20 indicators relating to good hygiene prevalence (Table 3). Of these most (except one in Tsholotsho and three in Makoni) showed higher prevalence in the intervention group, with 16 in Tsholotsho and 9 in Makoni having highly significant differences between club members and controls ($p < 0.001$).

In Tsholotsho (Table 3), indicators showing particularly high adherence to recommended practices including 'no open faecal disposal' seen in 100% of club members' households compared to 2% in the control, 'individual cups' (97% compared to 22%); 'ladle in use' (95% versus 30%); 'pouring method of hand washing' (91% versus 3%); 'individual plates' (86% versus 10%), and for 'hand wash facility owned' (80% versus 40%). Smaller, but still highly significant differences between intervention and control are seen in 'pot racks' (78% versus 41%); 'swept yard' (73% versus 49%) and 'rubbish pit owned' (64% versus 25%). No-one in the control group practised covered faecal disposal ("cat sanitation"), but it was practised by all those without latrines (57%) in the intervention group. Of the 43%

Table 2

Samples of Health Club members and control groups in Tsholotsho and Makoni Districts, Zimbabwe 2000, comparing demographic and socio-economic characteristics

Survey 2000	Tsholotsho		Makoni	
	Members (<i>n</i> = 354) %	Control (<i>n</i> = 59) %	Members (<i>n</i> = 382) %	Control (<i>n</i> = 113) %
At least 20 HE sessions	68	n/a	36	n/a
HE finished 6 mths–1yr	9	n/a	43	n/a
HE finished > 1yr	65	n/a	30	n/a
HE not yet finished	26	n/a	27	n/a
Women respondents	97	75	87	77
Respondents married	78	75	76	80
Respondents widowed	14	20	21	6
Female headed h/holds	76	54	55	53
H/hold size 4–6 members	34	24	36	26
Joint breadwinners	15	8	67	51
Male breadwinners only	38	29	4	19
Conventional christians	44	34	71	67
Apostolic christians	46	46	25	23
Completed primary school (male & female)	40	42	34	30
Primary & secondary school (male & female)	12	12	23	35
Average age of women	43	42	46	47
Average cash income p.a. RoE: US\$ 1 = Z\$35 (2000)	US\$298	US\$225	US\$378	US\$602

Table 3

Comparison of prevalences of observed hygiene indicators in homes of club members and controls, Makoni and Tsholotsho Districts, Zimbabwe 2000

Observed hygiene indicators	Tsholotsho				Makoni			
	% members <i>n</i> = 354	% control <i>n</i> = 59	χ^2	<i>p</i> -value	% members <i>n</i> = 382	% control <i>n</i> = 113	χ^2	<i>p</i> -value
Ladle owned	95	46	110.25	< 0.0001	52	42	3.44	0.0637
Ladle in use	95	30	116.01	< 0.0001	45	42	0.29	0.5908
Covered drinking water	96	90	—	0.05062*	88	91	0.6	0.4401
Individual cups	97	22	231.96	< 0.0001	98	66	99.17	< 0.0001
Individual plates	86	10	192.63	< 0.0001	97	64	96.75	< 0.0001
Pot racks	78	41	33.53	< 0.0001	94	82	13.56	0.0002
Borehole water	96	100	—	0.1112*	81	80	0	0.9909
Nutrition garden	60	19	32.99	< 0.0001	99	80	63.23	< 0.0001
Rubbish pit	64	25	29.64	0.0001	93	82	10.27	0.0013
Pit well managed	60	29	18.53	0.0001	55	29	22.15	0.0001
Swept yard	73	49	23.09	0.0001	44	37	1.39	0.2385
No open faecal disposal	100	2	396.75	< 0.0001	88	59	45.48	< 0.0001
Latrine owned	43	2	32.77	< 0.0001	74	57	8.15	0.0035
Latrine built in last year	42	3	31.01	< 0.0001	36	4	46.87	< 0.0001
Child faeces in yard	4	0	1.69	0.0807	16	23	2.75	0.0972
Used clean latrine	41	2	32.5	< 0.0001	38	31	1.8	0.1792
Hand wash facility owned	80	40	38.84	< 0.0001	45	20	11.57	0.0006
Hand wash facility in use	74	39	24.85	< 0.0001	35	20	8.06	0.0045
Hand wash facility + soap	39	20	6.82	0.0093	7	1	92.89	< 0.0001
Pouring for hand washing	91	3	230.98	< 0.0001	38	49	92.89	< 0.0001

**p* values show significance of difference between intervention and control, by χ^2 or (where indicated *) by Fisher's exact test.

who had latrines, most were built in the last year, and all except 2% were found to be used and clean. Soap was found at hand wash facilities of 39% of the members, versus 20% of the control. Importantly 60% of the members had nutrition gardens as opposed to only 29% amongst the control.

In Makoni (Table 3) there was less difference in hygiene practices between the intervention and control groups compared to Tsholotsho. However there were some significant differences indicated by use of 'individual cups' (98% versus 66%), 'individual plates' (97% versus 64%), 'pot racks' (94% versus 82%), having an active 'nutrition garden' (99% versus 80%), and a 'rubbish pit' (93% versus 82%).

Use of 'borehole water' and 'child faeces in yard' were not significantly different in either Tsholotsho or Makoni. 'Covered drinking water' was on the margin of significance in Tsholotsho ($p = 0.0506$). With those exceptions, every other indicator was significantly better in the households of Tsholotsho club members than the non-club control group.

Home visits and structured interviews

The house visits confirmed anecdotal reports that women had invested considerable effort in decorating

their kitchens by moulding intricate furnishings from unbaked polished clay. In Tsholotsho, painted clay dressers, with crockery neatly displayed, were an overt manifestation of aspirations to higher standards in the home. All 20 interviews confirmed that clubs continue to meet regularly, even if formal health sessions run by the Ministry of Health have been completed. Meetings focus on health issues in the area, report any public health risks like cholera outbreaks or malaria breeding sites, continue to monitor hygiene practices in the area and organise home-based care for those who need it.

Demand for sanitation

Most of those who have no latrine and still have to use the bush now practise 'cat sanitation'—digging a hole with a badza (hoe) before defecation and then covering faeces afterwards like a cat. Another local innovation observed in Tsholotsho was the 'badza stand', a forked branch to hold the hoe, erected in the yard of those members without latrines, complete with a plastic container for hand washing and some soap. This indicated that the traditional embarrassment over adult defecation had been largely overcome as the badza stand was an overt sign to passers-by of the new practice of cat sanitation and of club membership.

The demand for sanitation was high, with almost all members supporting the concept of safe sanitation and wanting to construct latrines, the only constraint being lack of financial support. In 18 months, 1200 club members in Tsholotsho had built latrines, local adaptations of the standard Blair (VIP) design promoted by the Ministry of Health. Sanitation coverage, 2% in the control area, was 43% in the project areas in Tsholotsho with the balance of 57% practising cat sanitation. In Tsholotsho, with men working elsewhere, women had done most of the building themselves, making interlocking cement bricks, cement slabs and vent pipes as well as cement hand washing facilities, and lined their own pits without bricklayers (Waterkeyn & Waterkeyn, 2000). In Makoni 2400 standard Blair latrines were built in 2 years.

Community Health Club homes are identifiable from a distance by the *badza* stand, wash hand facility, pot rack, washing line, fruit trees and nutrition garden and generally clean appearance of the compound, which are absent in most non-club compounds.

Discussion

Weaknesses and sources of bias

As elections were imminent in Zimbabwe in 2001 at the time, data collection was difficult for the enumerators who were sometimes suspected of opposition activity. With a real danger of physical intimidation, all enumerators were men and thus gender differences may have influenced respondents. In the control areas where the NGO was unknown, men were reluctant to let their wives talk and so in Tsholotsho fewer women were interviewed for the control. For the same reason control groups were smaller than intended, particularly in Tsholotsho where data collection had to be discontinued prematurely due to political intimidation in the area. Nevertheless the control group in each district was large enough for the positive differences between intervention and control to be statistically significant for most indicators.

The selection of the control group areas could have been more accurately matched in terms of demography. Although both districts were well paired in terms of religion, marital status, primary schooling and age in Tsholotsho, there were less female-headed households and income was slightly lower in the control area. In Makoni the control group had many more sole male breadwinners, more respondents attending secondary school and average income was significantly higher.

The differences noted between the two districts may be attributable in part to interviewer bias. Whilst all enumerators were trained together and the field work supervisor did spot checks in all areas, standards could

have differed between those that conducted the survey in Tsholotsho and in Makoni. However this would not apply to the comparison between intervention and control groups.

The sample of clubs in each district was chosen to include at least one club from each ward, and so prevent bias arising from different EHTs' methods; however, this meant that it was not precisely representative. The cluster sampling approach used when sampling within the health clubs will have affected confidence intervals and may have introduced bias. In most cases health clubs were purposely started in less advantaged areas, hence the higher incomes of the control group in both Makoni and Tsholotsho from adjacent non club areas. However this will have tended to decrease the margin of difference between control and intervention groups as some equipment may have been more affordable for the control group. Similarly, the higher level of secondary schooling in the control in Makoni may have biased results in the same direction.

How much effectiveness is needed?

It could be argued that the Community Health Clubs were only a limited success, because some of the most important hygiene indicators were seen in less than half the club members' households. For example, soap was seen at only 7% of the hand washing facilities in Makoni and 39% in Tsholotsho. These figures may underestimate the extent of soap use for hand washing; some informants told us later that they avoided leaving their soap on their outdoor wash stand, to prevent it from being stolen or eaten by goats or black kites. Nevertheless these results raise the question of how much change in a behaviour such as hand washing, can be expected from an intervention such as ours. Unfortunately, there is a dearth of rigorous literature on the effectiveness of behavioural interventions in developing countries (Loevinsohn, 1990), but a comparable example is provided by Borghi, Guinness, Ouedraogo, and Curtis (2002) who found that the strong effect of hand washing in preventing diarrhoea meant that a hand washing promotion programme in Burkina Faso, with a measured compliance rate of only 18.5%, was nevertheless very cost-effective. Indeed, in the present case it is remarkable that hand washing with soap had increased at all, as at that stage very little emphasis had been placed on the need for soap in hand washing in the health sessions—although this omission has now been addressed, given recent evidence of the effectiveness of the use of soap in hand washing as a primary barrier.

With regard to sanitation, the achievement of 3600 new latrines within only a proportion of two districts, can be better appreciated when it is set alongside Zimbabwe's total National effort of 8083 latrines

constructed for the whole country of 57 districts in 1998 (National Action Committee, 2000).

It has been argued that interventions to change behaviour should focus on a small number of target behaviours and minimise the number of messages which aim to change them, in order not to dilute their impact (Loevinsohn, 1990). That approach has been followed by most of the published studies of such interventions, which have tended to concentrate on four target behaviours or less (Stanton and Clemens, 1987; Haggerty, Muladi, Kirkwood, Ashworth, & Manunebo, 1994; Curtis et al., 2001). Typically, these have elicited compliance rates of 50% or less. In the present case, the Community Health Clubs approach, which was not implemented primarily as a research project, has achieved similar compliance rates or better on the majority of 20 different indicators.

Motivation and support of staff

Despite initial fears that this approach would be too labour-intensive, EHTs have all reported that health clubs have eased their workload. They coined the expression ‘the supermarket approach’ to describe how as with a ‘one-stop shop’, all their business could be done at one meeting, avoiding the usual time-consuming rigmarole of seeking out individual community members for various reasons. Other government ministries took advantage of weekly health club meetings to make their own announcements. The ease with which the extension workers were able to train communities can be attributed to a large extent to the fact that a large ‘tool kit’ of visual aids had already been developed. Trainers reported that the ready made visual aids had been an easy tool to use in participatory activities and the few who were sceptical at the training were soon converted to the approach.

EHTs were popular with the community and were driven by job satisfaction to meet a highly demanding schedule of training in a different club every day. Some EHTs were known to have honoured training commitments with clubs even during their annual leave. Enjoyment at running the sessions, and strong community appreciation of their efforts was a key aspect to their success. Many EHTs became so popular with their members that they posed a threat to the local councillors, though most of these were quick to support the approach, seeing its potential for winning support.

The provision of a reliable motorcycle was probably the most effective material incentive for the EHTs, although they were also given a nominal lunch allowance. Monitoring was done largely by the members themselves, who signed the travel claim forms for the EHT. The Ministry of Health and the NGO at district level met the EHTs only at monthly meetings. The NGO was active only in the initial 1-week training, in setting

up the reporting systems, and in monthly meetings. Only one NGO project officer was in each district, supporting the Ministry of Health, mainly with transport to monitor and attend graduations.

The sustainability of the approach is demonstrated by the many clubs with on-going activities which continue to function 14 years after the end of funding, and have a life of their own with minimal outside monitoring or inputs. That the health clubs have contributed in terms of health management for the community is clear.

Reasons for success of the Community Health Club model

Community Health Clubs sought to influence people in a co-ordinated group so that changes were approved by group decision rather than expecting each individual to take personal decisions. As the margin for failure is small in a poor household, individuals are wary of taking risks until interventions have proved reliable and cost effective. With group endorsement, individuals were prepared to undertake change without fear of failure. The underlying assumption was a ‘need to conform’ within traditional society, and the use of subjective norms as an influence on behaviour (Ajzen, 1988). The fact that health messages were repeated over a long period by peers as well as by authority showed a far more thorough reinforcement than had been applied in other PHAST programmes. The clubs sought to build self-efficacy, which gave members the ability to change with confidence (Bandura, 1986, 1997). The approach also recognised that in semi-literate rural communities there is considerable faith in the power of knowledge as a means of breaking the cycle of poverty. The ‘need to achieve’ (McClelland, 1961) which had been stimulated by intellectual activities at school, was left fallow once they married early and became mothers. We surmise that one appeal of the health clubs was their ability to feed the intellectual starvation of intelligent mothers in isolated village life where there are few opportunities for knowledge exchange and debate. The Community Health Club model, far from being a theoretical construct, was based on a sound psycho-social observation, and set in the paradigms of community development and social capital (Chambers, 1983; Kawachi & Berkman, 2000).

Variables affecting adherence to recommended practices

Our data show that Community Health Clubs can, under typical conditions, achieve high levels of health knowledge and hygiene behaviour change across a wide range of interventions, but this is not necessarily always the case. Tsholotsho consistently achieved higher levels of behaviour change than Makoni. A number of variables could explain why Tsholotsho was more receptive to change.

During discussions held with MoHCW staff to analyse the differences between the results in the two areas, it was strongly suggested by EHTs that the main difference between the districts is that the women in Makoni are full-time farmers and have far heavier agricultural demands than in Tsholotsho where most women live from their husbands' remittances. This is borne out by the results that show 38% of women in Tsholotsho, but only 4% in Makoni, are dependent on their husbands' income. By contrast, 67% of women of Makoni are joint breadwinners and spend most of each day in their fields for much of the year, and cannot always attend to the high level of hygiene recommended in the clubs. In arid Tsholotsho, where farming is difficult and cattle are the basis of subsistence, only 15% are joint breadwinners. Therefore it is surmised that these housewives have more time to keep their compounds clean and attend to hygiene recommendations, and this is also reflected in the high investment of their time in the decoration of their kitchens. The 41% increase in the prevalence of nutrition gardens, despite the arid nature of the area, indicates the strength of the club activities. Women's time is an important determinant of their ability to adopt healthy behaviour in many settings (Leslie, 1989).

The outstanding variable is the *extent* of the intervention in each district. The Ministry of Health was most active in Makoni where the project extended throughout the district and the methodology was fully entrenched. In Tsholotsho only three EHTs in three of the District's 19 wards were involved (Table 1), and they deliberately restricted themselves to a maximum of seven clubs per year, whilst in Makoni District, EHTs responded to the demand, splitting clubs when they became too large. EHTs in Makoni monitored an average of 17 clubs each in 3 years and thus could do fewer home visits than in Tsholotsho. Thus overextension and a shortage of EHT time could account for the lower compliance in Makoni. It may also be worth noting that the most effective area in Tsholotsho was run by one of the three female EHTs, who have all had significantly higher impact on levels of behaviour change amongst health club members than their male colleagues.

The MoHCW offered the EHTs little supervision in Tsholotsho, yet this area achieved the highest rates of adherence. With 17 different EHTs in the two districts, it may be imagined that their level of commitment would vary and affect the success of different clubs they facilitate. However all the EHTs, with only one exception, were remarkably dedicated to the programme, investing far more effort than duty demanded. If the Hawthorne Effect had been a factor that influenced productivity, it should have produced better results in Makoni, where the MoHCW was more supportive and there was regular outside interest, rather

than in Tsholotsho where there were seldom visitors. It would appear their popularity with the community was more of an incentive for EHTs to perform than incentives and supervision by their superiors.

Tsholotsho is the more underdeveloped area and in the three intervention wards, this was the first water and sanitation project since Independence in 1980. Therefore it is reasonable to infer that people may be more motivated and willing to invest more time and effort in marginalised areas, than in areas like Makoni where donors have been more plentiful, and their assistance taken for granted.

Where the baseline is low before intervention, higher percentages of change can be achieved. This would explain the relatively small changes in Makoni in some practices which have been recommended by MoH for years, such as using a ladle, pouring for hand washing, having a pot rack, a rubbish pit and cleaning the latrine. Covering water and sweeping the yard are traditional practices which show equally high prevalence in the control groups in both areas. Again, there is no significant difference in the use of borehole water for drinking as this was already practised universally in both Tsholotsho and Makoni. The impact of the intervention can be seen more strongly in practices encouraged uniquely in the project, such as the use of individual plates and cups. The use of 'cat' sanitation in the absence of latrines is also a new recommendation by the NGO, which proved highly acceptable. In Makoni, this practice increased by 14% in spite of the already high sanitation coverage, and in Tsholotsho 'cat sanitation' was adopted by all the 57% of respondents without latrines. By contrast it was not in evidence anywhere in the control area.

Conclusions

This intervention has demonstrated that by altering the norms that direct activity, a 'culture of cleanliness' can be created that will direct all behaviour towards more effective control of family health. Regular health sessions provide a forum in which peer pressure can influence members to conform to newly established norms.

The response of the Community Health Clubs in Zimbabwe shows that with appropriate resources, this methodology could halve the number without VIP latrines in the project area within a few years. With its effective cadre of MoHCW field workers, and with reliable transport for EHTs, the approach described here could be readily scaled up so that Community Health Clubs became institutionalised within the MoHCW in each of the country's 57 districts. It is estimated that there are 1,225,740 households without latrines (NAC, 2000) in Zimbabwe. To halve this by 2015 would require

only 51,072 latrines to be constructed per year, which averages at 896 per district. The experience in Makoni and Tsholotsho has demonstrated that with good support, at least 1000 latrines could be constructed per year through Community Health Clubs in each district. It would appear that given a motivated and mobile MoHCW field staff, good training materials and logistical support, there is little resistance from the community to improve hygiene and sanitation if the Community Health Club approach is used and programmes may even find it difficult to fulfill the demand for sanitation generated by this approach.

Where latrines are not feasible—for instance, in conflict settings or nomadic communities—the ready adoption of cat sanitation by health club members in our study shows an alternative path to the sanitation goal. Burial of excreta breaks the faecal-oral transmission route and constitutes the first stage of sanitation consciousness. Without any material subsidy, this practice allows almost 100% safe sanitation without construction of latrines. If time and resources allow, the community understanding of the need for safe sanitation may be expected lead to latrine construction. In the interim, an adequately sanitary environment is maintained at minimal cost. Of course, the physical technology of the *badza* stand or its equivalent must be accompanied by a viable approach to behaviour change, such as Community Health Clubs, to ensure its use and overcome embarrassment about adult defecation; when club members erect a *badza* stand, it is an overt statement of their practice of cat sanitation.

The methodology has also been replicated successfully outside Zimbabwe, even under difficult conditions (Waterkeyn & Waterkeyn, 2002). For example, in post-conflict Sierra Leone where within 6 months, 50 recently resettled Moslem villages reflected levels of adherence similar to those achieved in Tsholotsho. More recently, 120 Community Health Clubs have been successfully started in Internally Displaced People's camps in war-torn Northern Uganda, which is the first time the approach has been used in a peri-urban setting.

The following considerations affect the applicability of the approach to other developing countries:

- The more underdeveloped the community, the more effective the health clubs will be in achieving behavioural changes as they appeal strongly to illiterate and disadvantaged people, who lack a sense of self-efficacy and respond more readily to change within the context of group conformity.
- Where the baseline prevalence of good hygiene behaviour is low before the intervention, very significant changes can be achieved, especially in terms of improved sanitation and specific hygiene practices that can be controlled by the members themselves.
- Contrary to expectations, the approach does not require a certain level of literacy to be successful.
- Optimal levels of community support are gained by committed trainers; support to them in terms of reliable transport, appropriate training materials and fair incentives are essential, and these will be the main costs of the programme.
- Although the optimal number of clubs that can be managed by one trainer at any one time is around five, this must be weighed against cost considerations. The larger the number of beneficiaries, the cheaper the programme will become, but it may be less effective.
- Once the health clubs are established, they can be continued at nominal expense, with minimal monitoring; thus over time the costs per beneficiary fall.
- The membership card, a clear schedule of training and the public acknowledgment of dedicated members with a certificate, seems enough to attract community support to join health clubs, even without immediate material incentives.
- Health sessions should be continued until all those who want to join in every village have been given the opportunity; this may involve enrolment over at least 4 years.
- To sustain the life of the health clubs, health promotion should lead not only to the implementation of water and sanitation programmes, but should also continue to address all the needs of the community. At its most effective, the health club should become a vehicle for other initiatives such as income generation, adult literacy, human rights, and AIDS support and care for the terminally ill.
- Ideally, funding should be sourced from agencies interested in holistic development rather than short term, emergency interventions aimed at eradicating one particular disease.

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