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### MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

# Decreasing communicable diseases through improved hygiene in community health clubs

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*Community Health Clubs in Zimbabwe have proved an effective way to sustain hygiene behaviour change. In 2001, a survey of households indicated significant improvement in hand washing, safe sanitation, good water protection and food hygiene showing 16% difference between health club and control areas ( $p > 0.001$ ) in Makoni and 50% in Tsholotsho District. (Waterkeyn 2003) Recent research confirms that in areas of high coverage of health clubs, there have been significant decreases in reported clinical cases of communicable diseases over the past nine years. In Ruombwe, where health clubs have been operating since 1995 and where 80% of the households have members, diarrhoea has fallen from 404 cases in 1995 to 38 in 2003, and Bilharzia almost eliminated from 1,310 in 1995 to only one case. In addition, acute respiratory diseases have decreased from 2,136 to 159 and skin diseases have fallen from 685 to 41 in 2003.*

## Introduction

This article seeks to address two key questions that concern public health professionals:

- Can a method of health promotion be found that really does persuade people to change their hygiene behaviour?
- If people alter their habits, are they likely to sustain this behaviour permanently after the intervention ceases?

A recent multi-country study shows that communities are able to change their behaviour, and claims that 'It does last!', particularly if 'high priority and adequate resources' are given to the 'software component' of water and sanitation programmes. (Cairncross & Shordt, 2004) We would like to build on this conclusion by demonstrating that where a 'culture of health' has been established by a critical mass of people practicing good hygiene, these hygiene behaviours are likely to become permanent and reduce communicable diseases.

The Community Health Club Methodology<sup>1</sup>, uses health promotion as the entry point in water and sanitation programmes. This approach has been recognised as an innovative method to improve family health by effectively changing behaviour and creating a demand for sanitation (Sidibe & Curtis, 2002). Further analysis indicated that at 22c (US) per beneficiary this approach is cost effective and that by working through government systems it could be taken to scale. (Waterkeyn 2003).

A survey to ascertain whether hygiene behaviour had been improved showed that there was substantial difference in behaviour between health club members and the control group where there were no health clubs. (Waterkeyn & Cairncross, 2004). Four years after the project has ended and as much as nine years after the first health clubs were started, this article analyses disease statistics from Rural Health Centres.

It is now clear that in the older project areas, where there is a high density of health club members, there has been a significant reduction in diarrhoea, bilharzias, respirator and skin diseases.

According to established literature (Feachem, 1984) if good hygiene behaviour is practiced consistently, it is to be expected that the above diseases may be prevented. One way to gauge if family health is improving is to establish the prevalence of these hygiene behaviour by using proxy indicators. However, it is more persuasive if one can actually see changes in communicable disease patterns reported at Rural Health Centres if these can be correlated with the

**Table 1: Wards in Makoni District**

WARD	Year CHC	# CHCs	% CHC cover	# H/holds	# members
Ruombwe	1995	18	80%	2,224	1,777
Nyamidzi	1996	13	113%	1,358	1,540
Tanda	1996	14	24%	2,773	677
Tikwiri	1998	6	68%	753	516
Mutanda 1	1998	9	43%	1,186	513
Sangano	1998	10	20%	1,558	309
Dumbamwe	1998	6	78%	936	730
Ngowe	1998	12	56%	2,000	1,123
Weya	1998	15	90%	1,700	1,534
Mutungwa	1999	7	78%	947	740
Inyati	2000	5	9%	2,900	253
<b>Totals</b>		<b>96</b>	<b>53%</b>	<b>18,335</b>	<b>9,712</b>

Year CHC: The year in which health clubs formed and health promotion started

# CHCs: Number of community health clubs in each ward by 2002

% cover: The percentage of households with health club members by 2002

health promotion intervention.

This paper demonstrates that clinical statistics taken over the past nine years reflect a substantial decrease in reported cases of communicable diseases, and that this may be attributed to activities within community health clubs.

### Project area

The first health clubs started in 1995, in Zimbabwe, as a field trial of this methodology and in 1999 this was taken into the three districts of Makoni, Tsholotsho and Gutu. By 2000 there were 382 health clubs with 18,044 members and 108,264 beneficiaries. Over 60% of these members completed weekly health sessions on 20 different health topics, during which there were 50 recommended practices promoted, addressing all preventable diseases, within the control of the household (Waterkeyn 2003).

### Community health club methodology

The intervention was designed as a two year project, using health promotion as an entry point. The first year was dedicated to developing community cohesion or 'common unity' of purpose with a strong emphasis on acquiring knowledge of all communicable diseases that could be controlled by preventative action within the home. This included in particular, diarrhoea, bilharzia, worm infestations, skin diseases, eye diseases as well as less preventable diseases such as malaria, acute respiratory infections and HIV/AIDS. During the course of the first year the activities in the club were focused on transforming the household environment with such simple and inexpensive improvements as regular sweeping of the compound, safe storage of drinking water, safe storage of utensils on a pot rack, correct rubbish disposal. A major goal in the first year was a faecal free environment by burial of faeces (cat sanitation) for those without latrines or the hygienic use of existing latrines, with hand-washing facility and soap readily available. Recommended behaviour included regular hand-washing with soap using the pouring method, use of a ladle for taking drinking water, use of personal plate and cups (as opposed to communal eating), and safe storage and handling of food.

Although the regular weekly health sessions provided correct information, the methodology was based on the assumption that people do not change their behaviour on the strength of knowledge but rather need the pressure of their immediate community and family to galvanise them into altering traditional practices. Thus community monitoring was a vital component of this project as club members would visit from house to house where they encouraged and advised each other. This peer pressure was further reinforced within the clubs by the production of dramas and songs, as well as slogans that became a rallying cry in each village. Competitions were held for the best kitchen, as well as an annual quiz, and song and drama contest, accompanied by netball and running races. Thus health messages were constantly reinforced by community activities. The 20 health sessions were conducted by Ministry of Health Environ-



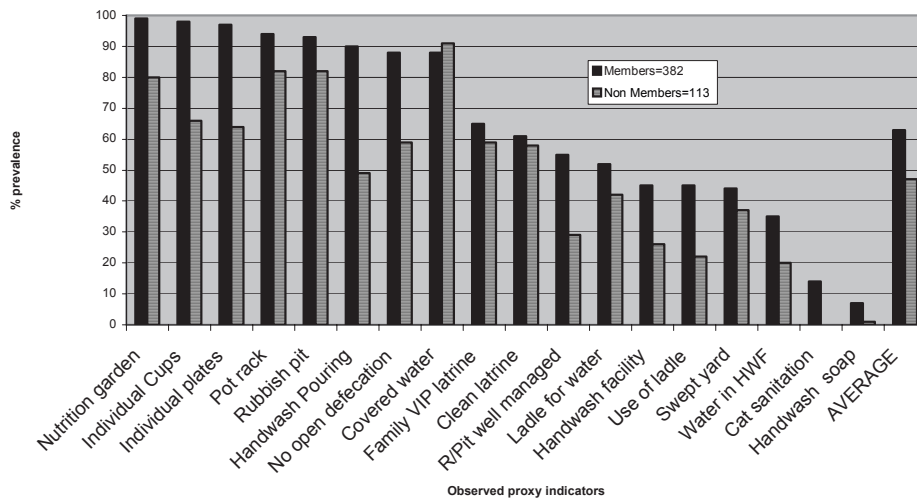
**Figure 1. A house proud health club member demonstrating her water storage and immaculate kitchen, with highly polished clay moulded shelves.**

mental Health Technicians (EHTs). These field workers are stationed at rural health centres in each ward. (A ward consists of an average of 1,500 households and 6 villages). EHTs have the responsibility of public health training and implementation of water and sanitation programmes. In the three project districts of Makoni, Gutu and Tsholotsho, 30 EHTs were trained at the start of the project and issued with participatory training materials developed by the facilitating NGO Zimbabwe AHEAD (Applied Health Education and Development) specifically for use within the programme.

A main objective was to ensure a high level of saturation of health club members within each village community. Each EHT can effectively manage five clubs each meeting once a week, and training continues for at least six months. When this is completed the EHT can take a second 'batch' through the 20 sessions thus ensuring within a few years that everyone in each village has an opportunity to join. Some early areas such as Ruombwe, have had five intakes and there are now 18 health clubs with a coverage of 80%. The highest coverage is in Nyamidzi ward with 1,540 members in a ward of 1,358 households, there is 113% coverage, indicating that there is more than one health club member from each family attending health club meetings. (See Table 1).

### Phase 2: Water and sanitation

In the second year, once a firm foundation of community co-ordination had been developed through trust and common understanding with the health club, social capital had been sufficiently developed to move into any initiative with the confidence. Having upgraded their own homes with their own resources, committed members were assisted with small subsidies to build their own latrines. Within 18 months, there were 3,400 VIP latrine constructed in two districts and the de-



**Figure 2. Difference of prevalence of observed hygiene indicators between members and non members in Makoni**

mand could not be satisfied. (Waterkeyn & Waterkeyn 2000). At this point there were also community based management of water supplies introduced in some areas, although this was not the focus in Makoni District. The strength of this methodology is demonstrated by the overwhelming demand for latrines that the health club sessions provoked.

### Sustainable livelihoods

Although the funding for water and sanitation finished in 2001, the health clubs in Makoni District continued with genuine sustainable livelihoods initiatives that continue to date with no material support at community level. Micro projects have continued within clubs and there are now over 500 income generating schemes including the making of soap, oil, paper, anti-mosquito lotion, bee hives and veils, and substantial funds are being generated from the sale of dried vegetable, honey and paper to commercial buyers. In addition each health club has a trained adult literacy Micro projects have flourished within clubs and there are now over 500 income generating schemes including the making of soap, oil, paper, anti-mosquito lotion, bee hives and veils, and substantial funds are being generated from the sale of teacher running regular classes, and a trainer in home based care for the terminally ill.

### HIV/AIDS home based care programme

There are currently almost 2,000 HIV/AIDS clients registered who are looked after by 398 trained HIV/AIDS Carers with at least one in each club. They have trained 358 club members who are caring for bed-bound AIDS patients, and are successfully pioneering the use of herbs to combat opportunistic diseases. The social affects of HIV/AIDS is being actively addressed within the club health as members arrange between them to support the orphans, widows and patients

themselves in terms of labour, donations, and nursing, as well as moral support and counseling for those affected. Despite the immense financial hardship of the last three years of political conflict in Zimbabwe, with 70% unemployment, 400% inflation, and widespread food shortage of the staple maize meal, the health clubs have maintained themselves with their nutrition gardens and income generating projects, and exhibited strong mutual support in a time of widespread national hardship.

### Household Survey

Whilst it was clear from anecdotal evidence that health club members were making immense progress within their own homes, there was a need to accurately document these achievements. In 2001, a study was conducted in the three districts and 75 health clubs randomly selected, 25 from each district. In each health club, 15 members were visited for a spot observation of key indicators of good hygiene. A control group of 300 non-club members were selected randomly from similar but non-project areas.

It is important to stress that all the observations were empirically observable and nothing was recorded purely on the report of good practice by the respondent. (Waterkeyn & Cairncross 2004).

### Hygiene behaviour change

#### Results

The results from Makoni District (See Fig 2.) show that there has been a significant difference in good hygiene practice between health club areas and non health club areas, with an average for 18 indicators of good practices being undertaken by 63% of the health club members as compared to only 47% for those living in non health club areas, i.e. a 16% difference between intervention and control groups.

Of these proxy indicators, the most successful behaviour changes in observed were:

- use of individual cups 98% : 66%,
- use of individual plates 94% : 82%;
- pouring for hand-washing 90% : 49%,
- no open defecation 88% : 59%;
- well managed rubbish pit 55% : 29%;
- used hand washing facility 52% : 26%.

### Cost-effectiveness of health promotion

It has been estimated that health education as a sole intervention can reduce diarrhoea by 35%, and good sanitation alone by 37% (Esrey 1991). However because diarrhoea has multiple causes, which include not only the use of safe drinking water but also safe food handling and good personal hygiene and sanitation a more holistic health promotion campaign is need that addresses all aspects of home hygiene, and does not just target water and sanitation and related diseases. The cause of many communicable diseases is rooted in poverty which limits the capacity of households to achieve higher standards of living, despite their knowledge of what is needed to protect their family from communicable diseases and their desire to upgrade their environment. Real development entails holistic programmes that deal not only with hygiene but also poverty eradication; they should assist not only in knowledge transfer but develop the capacity of a community to secure a safe livelihood. It is for this reason that the community health clubs are an ideal method to improving family health.

In addition it has been calculated that a health promotion programme of this nature can be achieved in one year at the cost of implementing at only 52c (US) per beneficiary (Waterkeyn 2001).

### Reduction of disease at health clubs

#### Possible sources of bias

Despite the breakdown in the rule of law in Zimbabwe since 2000, clinical records are still being kept in most rural health centres and the data was readily available from the District Hospital in Rusape. Whilst it is acknowledged that this data may not be entirely accurate, it is nevertheless informative, and does form a pattern that can be interpreted. It is clear that these figures represent only reported cases and do not represent the whole picture of the disease pattern in the area. Furthermore, with 33% of the population now estimated to have HIV/AIDS this will have affected the normal disease patterns, particularly as diarrhoea, skin diseases, and acute respiratory diseases are all opportunistic diseases associated with full blown AIDS.

The changing socio-economic environment in Zimbabwe may be another aspect that may confound the pattern of diseases reflected in clinical statistic. The economy for the past three years has been in free fall, with inflation of at least 400%, radically altering peoples' ability to pay for clinical services. In addition political intimidation has made travel more risky since the 2000 election. There has also been

national shortages of fuel, and limited public transport preventing people getting to the clinic by bus. This disincentive to travel to clinics has been compounded by a shortage of drugs meaning that clients often return empty handed even if they do go to the risk, inconvenience and expense of seeking medical assistance. For all these reasons we would expect to see clinical visits declining steadily in all health centres and this would be accounted for not by less disease, but by inability or unwillingness to pay for treatment.

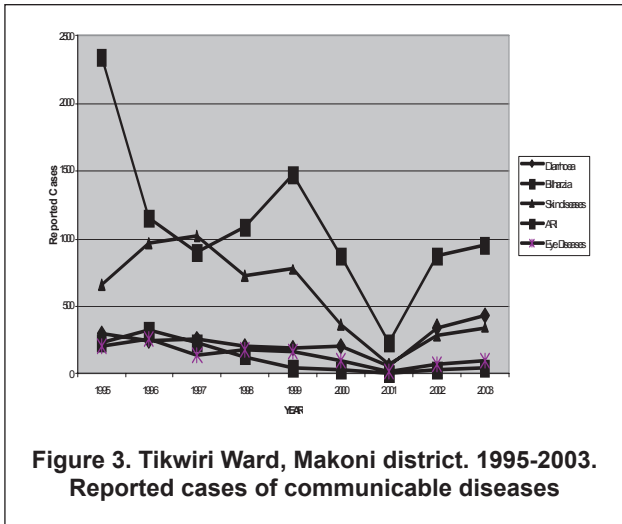
However in seven project wards we find that although the disease dipped sharply during the intervention period (1999-2001), this began to rise between 2001 and 2003 (despite socio-economic problems). This increase after the project ceased could be attributed to lack of hygiene promotion in some areas by EHTs once funding was withdrawn for periods. (See pattern for Tikwiri ward, Fig 3. below). It is also clear that patterns vary between health centres because of the particular circumstances in each ward. These variables include: length of period that health promotion took place and percentage of health club members within households, (See Table 1). Effectiveness of the EHT varies between areas and some EHTs may have slackened their efforts at health sessions after funding ceased or appreciation of their efforts diminished. Within communities the local leadership within each health club varies and degree of development of a culture of health varies according to charismatic leadership. All these aspects will affect the long term sustainability of healthy hygiene practices continued after project implementation ceased. Statistics from the Health Centres have not been adjusted to account for these qualitative variations.

### Results

If we are to safely attribute disease reduction to the CHC methodology without risk of confounding, all the patients that attend the clinic would have to be practicing health club members. However this is rarely the case as most health centres service a large catchment area with only a small percentage of clients being health club members. Therefore health club activities will not significantly alter the disease patterns reflected in clinic statistics unless there is a high density of health club members.

This is found in only in four wards: Nyamidzi 113%, Weya 90% coverage, Ruombwe 80% and Mutungagore 78%. (See Fig 2) There is a steady decrease in Nyamidzi/Mutungagore (both sharing Nyamidzi Health centre), and Ruombwe (See Fig 4 & 5). However despite having a high proportion of health club members, the statistics for Weya show an increase after 2000. However this may be because the Health Centre is actually a Mission Hospital taking in a large proportion of clients from neighbouring wards.

In the seven other wards most diseases diminished from 2000 to 2001 but started to rise again soon after the end of the project. This pattern indicates that hygiene behaviour in areas where health clubs members are not a high proportion of the population has not been as well sustained as in the older health club areas, where the proportion of health club



**Figure 3. Tikwiri Ward, Makoni district. 1995-2003. Reported cases of communicable diseases**

members is very high.

However the two oldest health club areas, Ruombwe and Nyamidzi where there are the most clubs and the highest density of members, showed a steep decline in communicable diseases which steadily diminished each year starting from the year after intervention in 1996.

**Toriro health centre, Ruombwe**

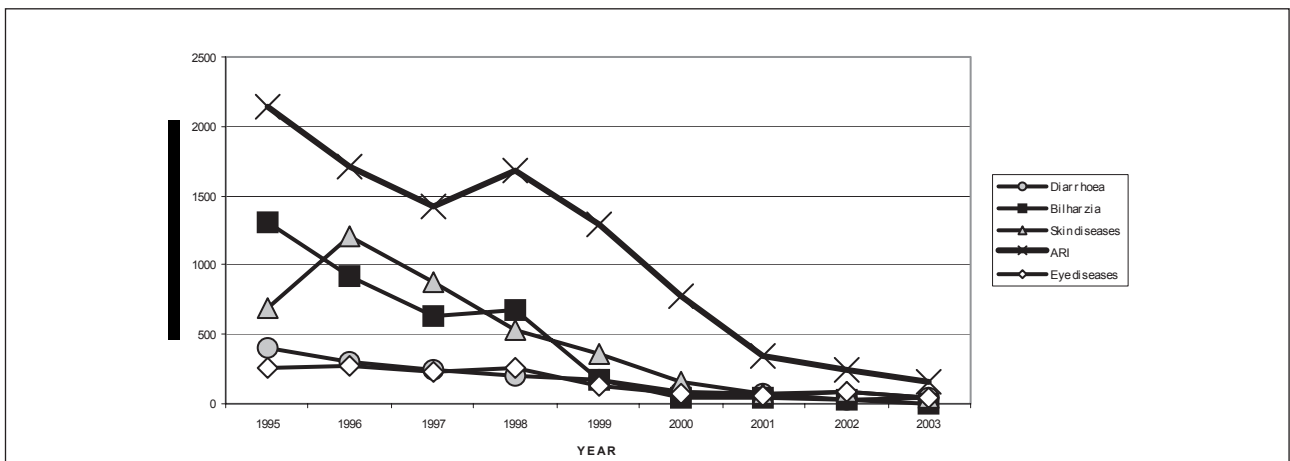
Ruombwe Ward (See Fig 3) was the first area in Zimbabwe to pioneer the use of community health clubs in a field trial where there were 5 clubs formed in 1995. By 2001 there were 18 health clubs within a population of 2,224 and it is noticeable that diseases started to reduce from the year of the start of implementation and were still decreasing three years after the EHT had left the area.

For example, reported cases of diarrhoea fell from 404 in 1995 to an average 38 in 2003. Bilharzia has almost been eradicated from 1310 cases in 1995 to only 1 case in 2003. Skin disease have decreased tenfold from 685 to 65, and eye diseases from 265 to 62. (See Table 2).

In 1995 Ruombwe ward that had the highest disease burden in the district with a total of 5,117 reported cases of communicable disease, including ARI and malaria. By 2004, Ruombwe ward had decreased tenfold, with only 592 cases. Taking the 1995 figures as a base line, it can be roughly estimated how many cases per year may have been saved. Subtracting the annual total from the 1995 and adding the results from 1996 to 2003 we can estimate a saving of 22,419 reported cases in the one ward of Ruombwe. This represents

**Table 2. RUOMBWE WARD: Toriro Clinic**

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Diarrhoea	404	301	244	198	166	81	65	26	38
Bilharzia	1310	924	630	673	178	43	45	26	1
Skin diseases	685	1204	874	526	364	155	67	90	41
ARI	2136	1715	1422	1684	1286	770	341	251	159
Eye disease	264	277	237	256	124	72	62	87	38
Malaria	318	488	597	548	220	246	243	119	315
<b>Total</b>	<b>5117</b>	<b>4909</b>	<b>4004</b>	<b>3885</b>	<b>2338</b>	<b>1367</b>	<b>823</b>	<b>599</b>	<b>592</b>
<b>Cases saved</b>		<b>208</b>	<b>1,113</b>	<b>1,232</b>	<b>2,779</b>	<b>3,750</b>	<b>4,294</b>	<b>4,518</b>	<b>4,525</b>



**Figure 4. Ruombwe Health Centre, Makoni District. 1995-2003. Reported cases of communicable diseases**

Source: Ministry of Health, Makoni District Hospital, Zimbabwe

a sizable reduction not only in potential deaths, but also of time, energy and the cost of treatment and transport. (See Fig 3.).

Whilst each member had six months of intensive health education, the programme has been running since 1996 in Nyamidzi, 1998 in Mutanda 1 and 1999 in Mutungagore. Thus the diffusion of health practices in the area is intensive with every household being associated with a health club. Although the level of disease in Nyamidzi was not as high as Ruombwe prior to project intervention, there is nevertheless a consistent downward trend each year: diarrhoea cases fell from a mean of 331 (1995-96), to 125 (2003); bilharzia from 692 to only 26 cases; skin diseases reduced from 820 to 208 and eye diseases from 247 to 36. (See Fig 4).

### **Nyamidzi health centre**

The second area in Zimbabwe to start community health clubs was under an EHT who had responsibility for the three wards of Nyamidzi (1,358 households), Mutanda 1 (1,186) and Mutungagore (947) which were all dependent on Nyamidzi Health Centre. This vast area in the south of Makoni District has a total number of 3,491 households. From 1997 the clubs were some of the best supervised in the district by an active EHT, and by 2001, there were a total of 29 highly motivated health clubs with 2,757 members. The density of health clubs members to number of households was 113%, indicating more than one member per household and this is the most successful area in the district. When the EHT was transferred in 2002, the community was sufficiently organised to continue without Ministry of Health supervision, and monthly meetings to maintain hygiene levels were arranged by health club leadership whilst all members continued with income generating projects. Whilst each member had six months of intensive health education, the programme has been running since 1996 in Nyamidzi, 1998 in Mutanda 1 and 1999 in Mutungagore. Thus the diffusion of health practices in the area is intensive with every household being associated with a health club. Although the level of disease in Nyamidzi was not as high as Ruombwe prior to project intervention, there is nevertheless a consistent downward trend each year: diarrhoea cases fell from a mean of 331 (1995-96), to 125 (2003); bilharzia from 692 to only 26 cases; skin diseases reduced from 820 to 208 and eye diseases from 247 to 36. (See Fig 4)

Using the mean of cases reported each year from 1995-97, it can be roughly estimated that in the past 7 years there has been a saving of 9,959 cases in this area as a result of the project intervention. It is also noticeable that diseases start to reduce at least one year after the project has been started, indicating that it takes time for practices to become established and filter through to a wider public, at a level of saturation which will affect the pattern of the disease at the clinic.

### **Acute respiratory diseases**

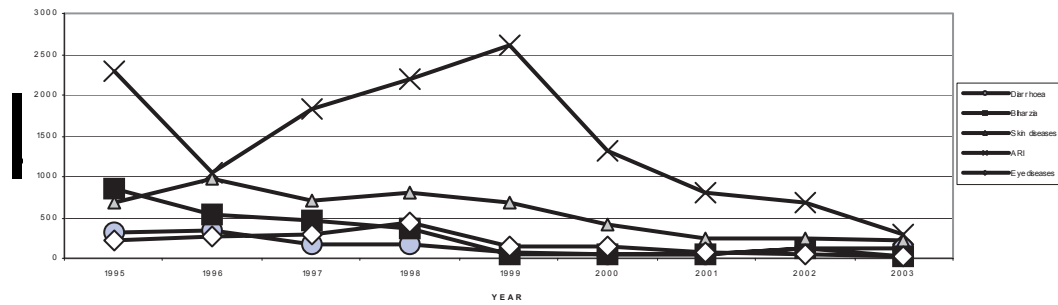
Acute Respiratory Diseases (ARIs) are usually the highest

cause of visits to the clinic. However, as viral diseases are not completely controllable by hygiene, the number of cases does fluctuate each year unlike the other communicable diseases that tend to reflect a downward trend. For example, all Health Centres registered a sudden peak in 1999, when there may have been an exceptionally virulent virus.

However, there are some hygiene measures that are recommended in the club which may have limited the spread of ARI. These could be the practice of isolating those affected from the rest of the family at night, not coughing and sneezing over others, using a handkerchief, and the use of individual plates and cups rather than the traditional practice of sharing. This may explain the fact that in Ruombwe the number of cases of ARI in 1995 was over 2136, falling to below 159 by 2003. Similarly, in Nyamidzi, ARIs were 2299 in 1995 and despite a peak in 1999 had fallen to less than 286 by 2003. In Tikwiri they fell from 2343 in 1995 to 953 in 2003. Again lesser decreases are found in the 3 year project wards: Dumbamwe fell from 815 to 652, Chiduku from 1595 to 888, and Inyati from 1290 to 307 during the same nine years.

### **Decrease in Malaria within some areas**

Malaria throughout Zimbabwe has been on the increase each year and this is reflected in Makoni District in the statistical data collected from the Health Centres. Although it is often maintained that malaria cannot be effectively controlled by anything less than mosquito nets, in particular those treated with insecticide (ITNs), this project appears to show that appropriate home initiatives and behaviour change can reduce malaria nominally. The recent research included in depth interviews with 20 health club members on a wide variety of topics, to understand the extent of ongoing activities within health clubs. Those interviewed emphatically maintained that they have successfully prevented malaria within their own families by eliminating breeding grounds as well as by covering themselves up at night, and burning cow dung to ward off mosquitoes outside their homes. In some areas club members are making lotion from citronella and others are using 'mosbar', a low-cost insect repellent soap available at some local stores. Very few people have mosquito nets and there has been no intervention to provide ITNs. Despite the annual rise in most areas, malaria in Ruombwe did not increase as there were 318 cases reported in 1995 and 315 in 2003. Nyamidzi increased 17% from 308 to 532, and Tikwiri 13% from 617 to 817. Nyahukwe decreased 9% from 268 to 254, although the other clinic in Dumbabmwe rose 14% from 133 to 192. However these rises are minimal compared to the larger mission hospitals that have a wider intake where malaria rise by 44% at Tanda Mission Hospital from 2292 to 5202 during the same period. In Weya Mission Hospital as almost as extreme with a rise of 38% from 1432 to 3735 in the past nine years. This may be attributed to the fact the spraying programs have decreased in the past four years due to budget collapse of Ministry of Health and may also be associated with high rate of HIV which often lowers



**Figure 5. Nyamidzi Ward, Makoni District. 1995-2003. Reported cases of communicable diseases**

Source: Ministry of Health, Makoni District Hospital, Zimbabwe

resistance to malaria.

## Discussion

The areas where there has been a roll-on of health training for 4-5 years ensuring that all interested households are involved, are the areas that are now proving the most self-reliant in terms of disease prevention. This is borne out by the pattern that clinical cases continue to three years after the 'health promotion programme ceased in 2001. These health center reports are substantiated by members who were interviewed in both Nyamidzi and in Ruombwe. These members ascertained that they still meet at least once a month to remind themselves of health and hygiene practices and to assist each other to improve their home hygiene. Thus although neither area has had an EHT for two years, peer pressure continues to exert an influence, and diseases prevalence continues to fall.

These findings indicate that to ensure sustained hygiene behaviour change it is necessary to have a hygiene promotion for at least five years. This will ensure that 80% of the households have been included in the programme and that good hygiene practices are widespread. Most of the members interviewed insisted that there is a completely different outlook between members and non-members and that health club members can control preventable diseases by good knowledge and practice.

## Conclusion

It is clear that the A.H.E.A.D Methodology using structured participation through community health clubs can increase health knowledge within the community, and does impact on hygiene behaviour change. Further, in areas where there is a dense coverage of Community Health Clubs and where the training has been running for more than four years, with roll-on sessions, that eventually include most of the households, there is a highly significant drop in common preventable diseases such as diarrhoea, bilharzia, skin and eye diseases, and it seems that the knowledge and practice acquired may also help prevent acute respiratory infections. It would seem that although malaria is still increasing in

some project areas, as it is across Zimbabwe, it is at a lesser pace in areas where health clubs practice some preventive measures. The key factor seems to be the intensity and the length of health promotion to ensure that a critical mass of people in the area have adopted the improved behaviour patterns, and that the follow-up continues for at least four years to ensure sustainable improvement in family health. This can be easily achieved using the A.H.E.A.D methodology and employing community health clubs as the vehicle for development.

Therefore the question of whether health promotion will change hygiene behaviour has been answered with an unequivocal 'Yes!' Rural villagers like most people, are desperate to improve their living standards. It is time to cease side-stepping the funding of health promotion and instead support initiatives that work and take them to scale. Most people readily change if they are convinced of the benefits, but they need time to develop this confidence that the time and effort is worth the outcome. If projects are ignored by the community, it is because the design has been appraised by astute villagers, who have little margin for error, and has been found lacking. With a methodology that works through group consensus, rather than individual incentives, and relies on peer pressure rather than rational knowledge to affect change, there is invariably a high level of community support. Funding is urgently needed to support holistic development programmes for five years to ensure family health improves. Using a community health club as a vehicle for local initiatives benefits can be sustained long after the funding ceases. If social capital has been developed community organisation is strong health promotion will continue without external support and actively improve family health. This is one of the ways to meet the ambitious Millennium Development Goal of halving the number without sanitation worldwide by 2015.

<sup>1</sup> This approach was pioneered by the NGO Zimbabwe AHEAD, (Applied Health Education and Development)

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