Chapter

A Comparative Study of the Efficacy of Community Health Clubs in Rural Areas of Vietnam and Zimbabwe to Control Diarrhoeal Disease

Juliet Waterkeyn, Victor K. Nyamandi and Nguyen Huy Nga

Abstract

The Community Health Club (CHC) Model in Makoni District, Zimbabwe operated 265 CHCs with 11,600 members from 1999 to 2001 at a cost of US$0.63 per beneficiary per annum. A decade later, 48 CHCs were started in three districts in Vietnam with 2,929 members at a cost of US$1.30. Hygiene behaviour change was compared using a similar survey of observable proxy indicators in both projects, before and after intervention. In Vietnam there was a mean of 36% change in 16 observable proxy indicators ($p > 0.001$) which compared positively with Makoni where there was a mean of 23% hygiene change in 10 indicators ($p > 0.001$). In Vietnam, 8 Health Centers reported a reduction of 117 cases of diarrhoeal diseases in CHC communes, compared to only 24 in non-CHC communes in one year; in 8 Health Centers in Makoni, Zimbabwe, a reduction of 1,219 reported cases over a 2–9 year period was reported, demonstrating the efficacy of CHC both in African and Asian context. We suggest that regular government data of reported cases at clinics may be a more reliable method than self-reported diarrhoea by carers in clustered-Randomised Control Trials, which have surprised practitioners by finding negligible impact of WASH interventions on diarrhoea in rural communities.

Keywords: community health club, hygiene behaviour change, sanitation, Vietnam, Zimbabwe

1. Introduction

This study provides a comparison between the first Community Health Club (CHC) pilot project in Makoni District, Zimbabwe in 2000 [1, 2] to the first a pilot project of a 'classic CHC' intervention in Vietnam which was researched and presented in conference proceedings in 2010 but not published [3]. Our interest is to establish if these two interventions can be considered efficacious in the prevention of diarrhoea in Community Health Club households in two very different settings.

1.1 Replication of the community health club approach

In the past 20 years, over 3,000 Community Health Clubs have been started in 12 countries in Africa reaching over 2.5 million people [4] but in SE Asia, only in Vietnam. Although CHCs have been replicated at a small scale in many countries, only in Zimbabwe and Rwanda have they gone to scale throughout the country [5]. In Zimbabwe most Non Governmental Organisations (NGOs) now use CHC as a standard means of mobilising community in Water and Sanitation Programmes and this method has been endorsed in both the Water Policy and the Sanitation Policy for the country and Ministry of Health is the custodian of this initiative though the Environmental Health Department. In Rwanda the government has taken a lead in coordination of all NGOs into a single National Community Based Environmental Health Promotion Programme (CBEHPP) in which CHCs have been started in all villages throughout the country [6]. A recent systematic review of studies reporting the effect of Community Health Clubs on behaviour relating to drinking water usage, sanitation, hand washing and clean kitchen hygiene [7] demonstrated a strong pattern of community response and a significant change in a wide raft of safe hygiene in virtually all such programmes conducting the 'Classic CHC' training as originally conceived [1]. However, this study is the first to compare CHC in Africa to a similar CHC pilot project in South East Asia.

1.2 Community health clubs in Zimbabwe

Makoni District in Zimbabwe was the first site internationally to field test the concept of a Community Health Club in 1994, and by 1999 an organisation called Zimbabwe AHEAD had been started to replicate and scale up the approach throughout the country.

Community Health Clubs are defined as a voluntary group of men and women, of all ages, education and income level, who are dedicated to improving the health and hygiene facilities and practices of all members so as to alleviate all preventable diseases and manage public health within the given catchment of the club. CHC are usually supported technically by Environmental Health Technicians (EHTs) responsible for public health who are usually based at Rural Health Centers who supervise voluntary community facilitators in at least 20 health promotion sessions every week for at least six months. The process of training has been well documented in the training manual [8].

1.3 Replication in Vietnam

In 2009, The Ministry of Health in Vietnam was looking for a hygiene behaviour strategy to galvanise communities into changing their high risk behaviour, as several approaches including PHAST [9], Community Led Total Sanitation (CLTS) [10] and Social Marketing [11] had already been tried in some areas but had not succeeded in reaching the last percentile. There was at this time much debate as to the most cost-effective methodology to achieve permanent hygiene and sanitation behaviour change.

As CHCs had not been used in S.E Asia at that time, there was some concern that with higher living standards in Vietnam, the CHC Approach could be too basic for rural Vietnamese. However, the level of literacy in women at 92% and in men at 96.1%, in Vietnam [12] was not much higher than in Zimbabwe which was 87.2% literacy for women and 94.2% for men in 2010 [13]. At the time, the national average for rural water supply household coverage in Vietnam was 83% whilst rural household sanitation was only 55%, of which only 18% of latrines in rural areas met

	Zimbabwe	Vietnam
National water supply household coverage	79%	83%
National rural sanitation coverage	24%	55%
Literacy in women / men (2010)	87.2% / 94.2%	92% / 96.1%
Number of Provinces	1	3
Number of Districts	1	3
Size of intervention area in hectares	802,800	225,100
Population in whole district (2003)	358,733	444,488
Households in whole district	65,225	98,775
% Households with CHC in whole district	17%	3%
Number of intervention wards /all	21/35	7/70
Number of CHC	265	48
Number CHC members	11,450	2,939
Number of beneficiaries	63,700	13,258
Average no members /CHC	43	68
Households in intervention ward/commune	38,181	10,824
Estimated % CHC coverage of households in intervention wards	30%	21% and 36%
Average Size of household	5.6	4.5
Period of intervention (1–2 years)	1999–2000	2009–2010
Number of health sessions held (I year)	3,731	960
Number of latrines built in 2 years	2,400	441
Cost per beneficiary per year	US$ 0.63	US$1.30

Table 1.
Demographic comparison between CHC intervention in Zimbabwe and Vietnam showing scope of project.

government standards of hygiene [12, 14]. Again, this compares to Zimbabwe where rural sanitation was estimated at 25% and rural water supply at 79%. Whilst the two cultures of Zimbabwe and Vietnam appear quite different, the demographic level are not dissimilar (**Table 1**).

2. The interventions

2.1 Makoni District, Zimbabwe

By the year 2000 there were 265 CHCs in 21 out of 35 wards of the district with 11,600 CHC members, involving an estimated 63,700 beneficiaries, calculated by the average of 5.6 family benefitting from improved hygiene in each family. During the period under review there had been 3,731 health promotion sessions held by 14 EHTs. Subsidies for VIP latrine construction at that time resulted in 2,400 VIP latrines being constructed in 2 years, which was considered remarkable given the total for the country was only 8,000 in 1998. No water component was included in the project, but the district was higher than the national average with 676 functional boreholes and 839 family wells [12]. The project was completed in 2000 when most donors withdrew from Zimbabwe for political reasons, and the CHC were largely left to their own resources, except those which continued with income generating activities started in a later programme [2].

Wards	Start Year of CHC	Spread of CHC	All h/holds	CHC members
Ruombwe	1995	80%	2,224	1,777
Nyamidzi	1996	113%*	1358	1540
Tikwiri	1998	68%	753	516
Mutanda	1998	43%	1186	513
Dumbamwe	1998	78%	939	730
Sangano	1998	20%	1558	309
Inyati Mine	2000	9%	2900	253
Chiduku	2000	NA	NA	NA

**Over 100% indicates more than one CHC member per household in the CHC.*

Table 2.
Spread of CHC in wards where health centers have provided reported cases of diarrhoea.

2.2 Adaptation of the CHC approach in Vietnam

The pilot CHC project was started in three Provinces of Northern Vietnam, Son La, Phu Tho and Ha Tinh with 48 CHCs with 2,393 members. An active health club of committed members was established in every village to manage environmental health and encourage community hygiene through non risk practices. Village Health Workers already part-employed with Ministry of Health were trained to conduct the sessions. The period of intervention was similar in both countries being from 18 months to 2 years with 20–24 sessions completed in a six-month period of weekly training.

2.3 Comparative scope and spread of the two interventions

The scope of the programme in Zimbabwe was five times larger than the pilot project in Vietnam. However, although the size of each CHC *appears* larger in Vietnam with a mean of 68 members compared to the Zimbabwean CHC with 43 members, those in Vietnam counted *all* members at registration but with no indication if they attended or not, as membership cards were not used. In Zimbabwe, only the *active* members who completed training were counted as members; if all registered members were counted the mean would be around 80 members. Also, the CHC density (spread) is high in Makoni with 21 out of 35 wards in the district with CHC, whereas in Vietnam only in 7 out of 70 communes had CHC. In Vietnam the two communes had a spread of 21% CHC households in Son La and 36% in Ha Tinh, whilst that of Phu Tho was not calculated. The mean coverage in Makoni was 30% but this ranged from 9% coverage in a new area such as Chiduku, to 113% in Nyamidzi where all households were in a CHC, some with more than one per households as a CHC Members. **Table 2** above shows the % spread in the 8 wards where data was collected from local Health Centers.

3. Methods

3.1 Objectives

This study seeks to compare outcomes from the Vietnamese pilot project and compare it to the Makoni CHC pilot project, in five measures: improved knowledge, hygiene and sanitation behaviour change, reduction in disease, cost-effectiveness and stakeholder perceptions.

3.2 Data collection

3.2.1. Data Collection in Zimbabwe

A case/control study was conducted in Zimbabwe in three districts, of which one of the districts was Makoni. The standard indicators used to measure hygiene and sanitation behaviour change included a spot observation of 17 indicators taken in 25 randomly selected CHCs, and within each CHC a random sample of 382 CHC members. These indicators were observed before and after in the CHC intervention villages and in the 113 households of non CHC members, in control villages using similar empirically observable proxy indicators to quantify changes in hygiene facilities and standards of cleanliness. There was no self-reported behaviour. Full details of data collection and analysis are fully described elsewhere [1, 2].

3.2.2. Data collection in Vietnam

3.2.2.1 Quantitative

- A household survey was carried out twice (pre and post) in each of the three Districts. As every household was surveyed in every village, there was strong statistical validity. Each enumerator was meant to survey 100 respondents, but when there were not enough CHC households, they also surveyed non-CHC households and the respondents were not differentiated in the data. Therefore, these statistics may show a combined level of CHC and non CHC, and the rate of change within the CHC membership may therefore be higher than shown [3].

- Secondary data was collected from 8 clinics in CHC areas and 5 clinics in non-CHC areas by the Ministry of Health and provided for analysis. The number of reported cases for Diarrhoea, Dysentery and Food Poisoning (DD & FP) in 2009 was collected and compared to those in 2010.

3.2.2.2 Qualitative data

- Structured interviews were done with key informants which included district officials and nurses from Ministry of Health and village leaders [3].

- A spot observation of a sample of six CHCs in action was done and six individual homes were visited, one in each of the Community Health Clubs.

3.3 Analysis of data

In Vietnam, analysis of data from each Province of the base line and post line survey was done by Ministry of Health officials and provided to one of the authors in excel for her interpretation. All data was cleaned and in this process it was decided to discard data from two of the districts (Phu Tho and Son La) because the standard household survey had been adapted by each district, which made comparative analysis difficult. Therefore, only data from Ha Tinh is used because it could provide raw data for the full base line and post intervention survey that could be checked. In this district a survey of 7,187 base line respondents, and 1,200 post intervention respondents was undertaken, and used to ascertain levels of knowledge and behaviour change. It was converted into SPSS statistics package and standards test of Chi square used to compare data sets [15].

3.4 Sources of bias and confounding

Some interviewer bias can be expected, as the data from the household survey in both Zimbabwe and Vietnam was collected by the same Village Health Workers who facilitated the project. However this was triangulated in spot checks using observable indicators which could be verified empirically.

The statistics collected from the Health Centers both in Zimbabwe and Vietnam are considered impartial as reported cases were not influenced by the objective of this research. The data was collected and analysed by each district by Ministry of Health and presented in their annual reports. National statistics also show a gradual trend in improvement of most communities in Vietnam over the previous five years (NTP2) [12]. Therefore, to identify the impact of only the CHC training we compared CHC with non CHCs areas as a control for clinical reported cases.

Ministry of Health statistics in Health Centers were taken to track the pattern of disease in wards or communes where CHCs were operational in both countries despite the fact that these figures may not reflect the true burden of disease, as only the most critical cases will be reported. This is not critical to this research as it is the pattern not the extent we are interested in examining. In Zimbabwe, the two wards where there were large hospitals were not used because the catchment of patients was referred from other areas and therefore could not be attributed to the CHC training.

In Vietnam, the CHC Pilot project was not the only health promotion being done in these districts during this one year period. In Ha Tinh, a Unilever Programme using extensive Social Marketing techniques promoting handwashing with soap was running concurrently for one year in all communes, including the CHC communes. Therefore, to avoid confounding and to measure the impact of *only* the CHC, we have only sited findings from topics which were not included in Unilever Information Education and Communication (IEC) material.

4. Results

4.1 Vietnam

The results for Vietnam are provided in five measures: improved knowledge, hygiene and sanitation behaviour change, reduction in disease, cost-effectiveness and stakeholder perceptions.

4.1.1 Improved knowledge

The spot observation done in two CHC per Province provided ample anecdotal evidence of the popularity of the CHCs, with high levels of attendance with an average of 68 people at each session.

The Vietnamese showed a strong interest in health education and although basic knowledge of hygiene was high, it did not seem that the training was pitched too low for their level of education. Two questions were asked to establish difference in health knowledge: the causes and prevention of diarrhoea and how to make Sugar Salt Solution (SSS) a homemade recipe to treat dehydration. Whilst the former was well-known due to Unilever programmes and showed little difference before and after the training (94%), knowledge of how to make SSS, was increased by 42% (**Figure 1**) and is more reliable an indicator as this was not taught in the Unilever programme.

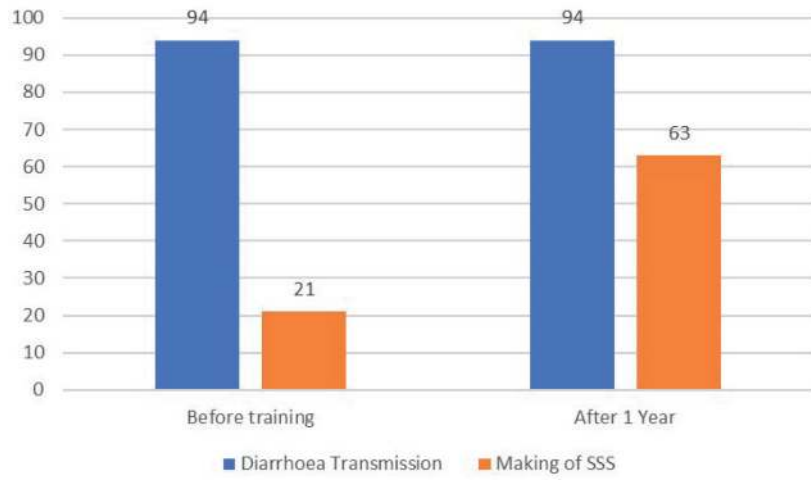

Figure 1.
Improved knowledge in Ha Tinh, Vietnam, after one year of health promotion using two indicators (2009–2010).

4.1.2 Hygiene and sanitation behaviour change

4.1.2.1 Hygiene in the home

Of the three provinces we chose to use Ha Tinh with 12 CHC and almost 900 CHC members as it provided the most reliable information on levels of hygiene behaviour change as summarised in **Figure 2** below. Across 17 indicators, only one indicator, the use of bednets, i.e. 'protection from mosquito' showed no significance at all, as it was 100% in both pre and post intervention survey. In the other 16 indicators, all practices showed compositive behaviour change of 36% (the mean of all 16 indicators) after one year: 'safe water source' and 'drinking water treated', which had

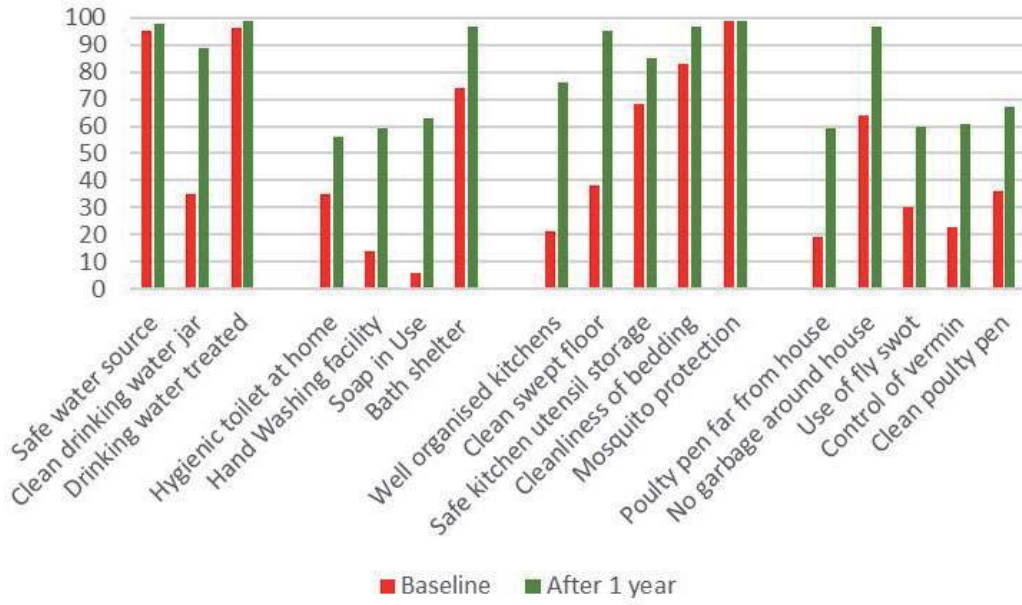

Figure 2.
Prevalence of observed proxy indicators of safe hygiene in CHC members after one year of health promotion, in 2 communes Ha Tinh District, Vietnam. (2009–2010).

been advocated by previous WASH projects were significant at $p > 0.05$; the other 14 indicators, not used in previous projects, were highly significant ($p > 0.001$).

- Hand washing facilities improved by 45% (from 14–59%)
- use of soap improved by 53% (from 6–63%)
- Safe storage of water increased by 54% (from 35–89%)
- 89% households had a combined measure of safe drinking safe (source, storage and treatment)
- The coverage of toilet increased from 35–56% after a year, with 265 new pit latrines, 7 covered pit latrines, 71 new composting latrines, and 71 with a septic tank (414 in total).
- Safe storage of kitchen utensils improved by 23% (from 68–85%)
- 'Well organized kitchens' (plates and food stored safely) improved 55% (from 21–76%).
- Clean swept floors increased by 57% (from 38–95%)
- Cleanliness of bedding improved by 14% (from 83–97%)
- Clean compound surrounded the house improved by 33% (litter decreasing from 36–3%)
- fly control increased by 30%, with 60% of people owning and using a fly swot to kill flies
- homes practicing some form of vermin control increased by 42%, from 23–61%

4.1.2.2 Speed of sanitation behaviour change

Community Health Club records were used to analyse the speed of adoption by the CHC members. At base line there was 99% open defecation in Ha Tinh (**Figure 3**). When a survey was taken only one month into the training when CHC members had attended 1–4 sessions, open defecation had decreased to 84%, with 13% now practicing cat sanitation and 3% having constructed a permanent latrine.

By the second and third month when between 5 and 12 sessions had been attended, open defecation had plummeted to only 2% with a massive uptake of 87% practicing cat sanitation, with 10% constructing permanent latrines and 1% having a temporary latrine.

By the time more than 20 sessions had been done, it was found that 49% had constructed a permanent latrine and 50% were still using cat sanitation with 1% having a temporary latrine.

Thus in 5 months Zero Open Defecation (ZOD) had been achieved.

4.1.3 Reported cases of diarrhoea, dystentry and food poisoning

Diarrhoea, Dysentery and Food Poisoning (DD & FP) are listed together as one category in reported cases in Health Centers in Vietnam. The communes selected

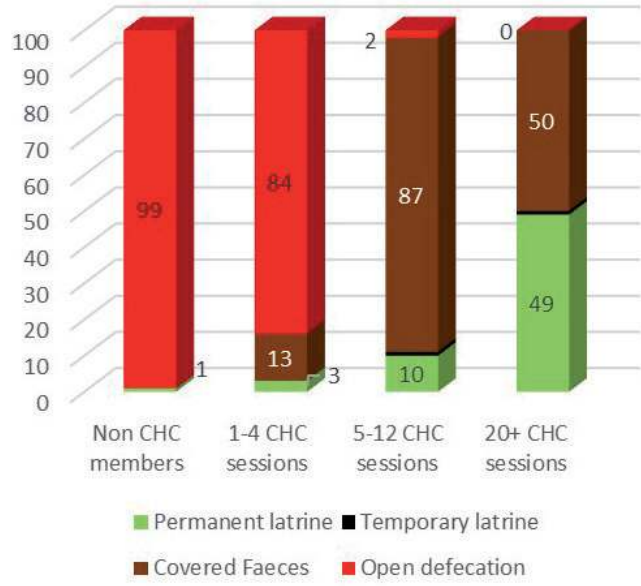

Figure 3.
Uptake of safe sanitation correlated with number of health sessions attended in community health clubs in one year in Ha Tinh District, Vietnam, (2009–2010).

for CHC were in most cases, the more challenging areas as shown by higher DD & FP at baseline (**Figure 3**, *above*). The data from all three provinces showed the same pattern of reduction in areas where Community Health Clubs were fully operational, all with a downward trend in reported cases. In total there were an estimated 459 saved cases in CHC Communes.

The Community Health Club communes showed a sharp decline in reported cases of DD & FP from a total of 171 cases to 17 cases in one year, saving an estimated 154 cases, a mean reduction of 61 cases in each commune from 2010 to 2011. By contrast, control communes with no CHC, reduced in DD & FP reported cases from 99 to 75, only 24 down from the previous year (**Figure 4**).

Of the non-CHC Control communes, only Pi Toong in Son La decreased in DD &FP, whilst in the two other non-CHC Communes Thach Vinh and Thach Dai reported cases of DD & FP *increased* in reported cases, despite the fact that in the latter a Social Marketing campaign was being conducted. In Son La Province, with a

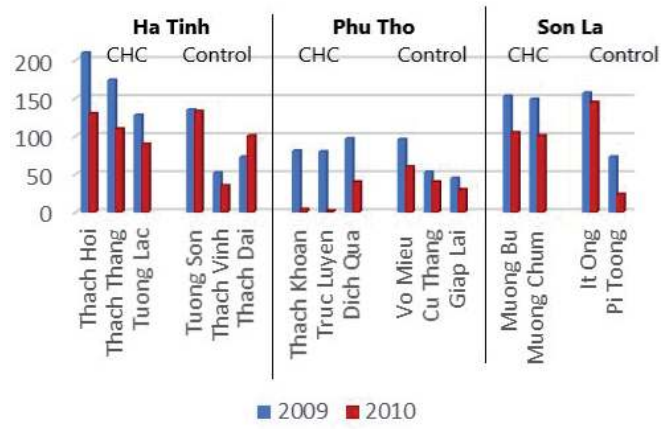

Figure 4.
Reduction of reported cases of diarrhoea, dysentery and food poisoning (DD & FP) in 7 CHC communes in Vietnam after one year of health promotion activity (2009–2010).

higher density of 12 CHC in 55 villages in the catchment of the Health Centre, there were no other public health programmes, therefore we attribute the decrease in DD & FP to the CHC intervention.

However, the data could not determine if there were fewer reported cases at Health Centres due to successful prevention of DD & FP by safe hygiene, or due treatment at home using SSS, but either way these numbers show some positive effect. Nurses interviewed from the Health Centres attributed the decrease in cases to the CHC training and maintain that patients were more able to distinguish between when it is necessary to come to the clinic for treatment and when they can treat dehydration at home. This clear pattern in six well matched communes, provides some indication of the potential of hygiene and sanitation training in CHC to affect health outcomes.

4.1.4 Cost effectiveness of the CHC intervention

We apply the same method of assessing cost-effectiveness in Vietnam as we did when estimating cost per beneficiary in two districts of Zimbabwe [1]. In Makoni District in two years for 68,700 beneficiaries we estimated a cost per beneficiary of US$ 0.61: this included in addition to training and running costs, support in terms of allowances and fuel and motorbikes for 14 government field workers [3]. Whilst this method of dividing the cost of operation of the project by number of beneficiaries is a fairly rough approximation, it can give some comparative data to enable assessment of cost-effectiveness in Vietnam using the same equation.

The 48 CHC in Vietnam were run by Village Health Workers, who were given a nominal incentive, but no transport or fuel allowance as they were stationed in the village. The only costs in Vietnam were for the initial training in the District, which was done in 2009. The running costs for two years was estimated in one Province at US$45,045. Taking the national average of 4.5 family members per household with 2,929 CHC member, there were **13,258** beneficiaries. Thus, cost per beneficiary can be roughly estimated at US$1.30 per annum for two years (2009–2010) per district [3].

Cost-effectiveness is determined by the number of beneficiaries and the CHC approach is a methodology which can work at scale. The Zimbabwe programme was almost 5 times larger than the Vietnam pilot project and was therefore a third of the cost per beneficiary. Generally pilot projects are not expected to be cost-effective as they tend to be small scale with large start-up costs which make them more costly per person. However, as with the pilot Community Health Club project in Vietnam, this rough calculation may provide some indication of the cost-saving that could be achieved at scale.

4.1.5 Perceptions of stakeholders of the community response

Perception of project success can be ascertained from the stakeholders and for this reason we conducted a structured interview with health officials in each province in Vietnam [16] and asked them to rate the 'popularity' of Community Health Clubs from 1 to 10.

Community Response in Phu Tho, was rated at 7 out of 10, with officials saying, 'the *CHCs are very popular because people do it voluntarily, they vote for the committee and they organise it all themselves…more focus on the practical and more participation. They do not rely on the facilitator, so it is a two-way teamwork and promotes a good spirit.*'.

In Son La officials gave a score of 8 out of 10 and reported: '*We are very satisfied with the changes and expect that it can be replicated to other districts. With experience*

it has improved knowledge and skills, not only for district but also for provincial staff. Before we had to deal with health promotion but not in a professional way, no materials, so after CHC training we know how to do it.'

The highest score was given by officials in Ha Tinh with 9/10, who said that community '*have better relationships with each other, and exchange information, do village clean ups, have better coordination and help improve knowledge and awareness.*' One official declared that the CHC Model is *'low cost- high impact'*.

4.2 Results from Zimbabwe

The impact on behaviour change found in Makoni [1] are now summarized. Clinical data is now provided to assess if there was an impact on health in CHC areas in Zimbabwe. By 1999 there were 42 Health Centres throughout the 20 communal wards of Makoni, of which 12 had resident Environment Health Technicians (EHTs). A communal ward consisted of five or six scattered villages and between 1,000–2,000 households of mostly subsistence farmers.

Whilst the Health Centres cater only to the local population of up to 3,000 people (usually within a 10 km radius), the district hospitals are referral centres for all the surrounding health centres, often over 50 kms away. District hospitals, therefore, did not reflect the same pattern of decrease, presumably because many patients are likely to be referred by Health Centres from areas where there may be no Community Health Clubs. Most Health Centres, on the other hand, situated within a CHC catchment area, did register some downward trend, not only in diarrhoea, but also in skin and eye diseases, ARIs, schistosomiasis and some malaria during the intervention period [15]. Bilharzia was almost eliminated from 1,310 to only one case; Acute Respiratory Diseases decreased from 2,136 to 159 and skin diseases fell from 685 to 41 reported cases.

For the purpose of this paper, we examine only diarrhoea reported cases for comparative analysis with Vietnam. We took the data collected in 8 Health Centres, between 1995 and 2003, which was two years after the end of the project in 2001 [16]. Most notable is the pattern that *in all wards* reported cases of diarrhoea start to fall in the same year that CHCs start in each ward even though the start-up year may be different in each Health Centre, as shown by the shaded areas in **Table 3**. Furthermore, cases in all 8 wards *continue to decline* until 2001 when there is a *rise or a spike* in all but two wards: the two oldest wards of Ruombwe remains low (38 cases) and never climb back to its original level of 404 as in 1995 and Mutanda maintains the fall but starts to rise the following year 2003, when the highly effective EHT left the area. Tikwiri by contrast, without an EHT after the project ended in 2001, climbed straight back to previous levels of diarrhoea in two years (437) with 124 more cases than in 1995 (**Table 3** below). The effect of the charisma of different EHTs is a variable which should be correlated more closely with behaviour change.

This lack of sustainable reduction of diarrhoea maybe attributed to the circumstances in Zimbabwe where in 2001, political change and economic inflation started to affect the country. However, if these circumstances caused the decrease in reported cases, it stands to reason that all wards would have been equally affected. The question to be asked is 'Why is it that one ward, the one which was the most diarrhoea-affected of all wards in 1995, continued to decrease in reported cases across all diseases over nine years, despite the economy and other constraints shared by all other wards?' Our explanation for this is that only in Ruombwe ward was there a dedicated EHT and active CHCs for nine years, and only in this ward was the coverage of CHC members of all households sufficiently high (80%) with 18 CHCs and 1,777 members out of 2224 households in

Health Centres	1995	1996	1997	1998	1999	2000	2001	2002	2003	1995 less 2003
Ruombwe	404	**301**	**244**	**198**	**166**	**81**	**65**	26	38	–366
Nyamidzi	325	338	**162**	**181**	**79**	**56**	**50**	117	125	–200
Tikwiri	303	248	**266**	**210**	**191**	**210**	**56**	348	427	+124
Mutanda	180	231	**71**	**85**	**119**	**127**	**122**	82	135	–45
Dumbamwe	144	141	119	138	**92**	**103**	**66**	118	143	+1
Sangano	105	163	256	200	**259**	**293**	**101**	221	149	–44
Inyati Mine	144	170	259	189	106	**63**	**34**	82	75	–69
Chiduku	182	148	182	204	346	**89**	**74**	94	76	–106
Total all CHC	**1787**	**1740**	**1559**	**1405**	**1358**	**1022**	**568**	**1088**	**1168**	

Shaded area indicates the span of the CHC in each of the wards. Underlining represents a decrease from previous year.

Table 3.
Number of reported cases of Diarrhoea in 8 health Centres in Makoni District, Zimbabwe 1995–2003 [17]
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the ward participating in the programme, all of which were accessing one Health Centre (**Table 2** *above*). Furthermore, Ruombwe being the first ever CHC project received high visibility externally [15]. This finding reinforces the need for CHC activity to continue for many years to ensure that a sufficient number of people in the area are converted to good hygiene and that this standard is taken as a norm in all households. This take more than a couple of years which is the normal length of a WASH project.

In wards which had been going for five years there was a higher number of CHCs and *(See* **Table 2***)*, the downward trend of reported cases remains low. In wards where CHC had been active for one or two years (Inyati and Chiduku) downward trend was reversed the moment the project officially ended in 2001.

The total number of diarrhoea cases from all wards decrease from 1,787 to 568 between 1995 and 2000 which were the years of intervention. Although the number of cases mounts again to 1,168 two years after the end of the project, the same level is not regained in six out of eight wards by 2003.

To understand which variables affects these differences we would have needed more contextual information from that period: it could be the effectiveness of the EHT, the local leadership, the proximity of the ward to urban areas and the impact of rising HIV/AIDS infections which at the time were 30% of the population. Our sense is that the *length* of the intervention, which also affects the *spread* of CHC members is probably the most important variable, but more contextual information is needed to interpret this data.

4.2.1 Intermediate outcomes of hygiene behaviour change in Makoni District

The most significant intermediate outcomes of hygiene behaviour change were found in 10 proxy indicators showing a mean improvement of 24% ($p < 0.001$) as follows:

- Use of individual cups was 98% in CHC intervention, 66% in control
- Use of individual plates was 97% in CHC and 64% in control

- Use of pot racks was 94% in CHC, 82% in control
- Having a nutrition garden was 90% in CHC, 80% in control
- Using a rubbish pit was 93% in CHC, 82% in control
- Management of rubbish pit was 55% in CHC, 29% in control
- No open defecation was 88% in CHC, 29% in control
- Latrine built in last year was 36% in CHC, 4% in control
- Handwashing facility owned was 45% in CHC, 20% in control
- Handwash facility with water was 35% in CHC, 20% in control.

5. Discussion

This paper describes for the first time, how a seemingly 'African' approach [13] is in fact transferrable to a South East Asian context, into a very different society, but one which faces the same challenges of poverty and ill health associated with WASH related disease as Zimbabwe. The Community Health Club Approach is a method of community mobilisation and is considered culturally well aligned with traditional communal life in Africa, providing a much-needed means for the empowerment of women and their advancement through increased knowledge of basic causes and prevention of disease. From its first field trial in Zimbabwe [1], the methodology spread to at least 15 countries in Africa to our knowledge, easily replicated by one of the authors in Uganda [18], and Rwanda [17] in East Africa, in Cape Town and Kwa Zulu Natal [16] in South Africa and in Sierra Leone [19] and Guinea Bissau [20] in West Africa, and by others to Haiti in the Caribbean [21]. Monitoring data from all these projects have demonstrated measurable changes in health knowledge, hygiene and sanitation behaviour change, and even in some places an impact on health but more peer reviewed research is needed to ascertain the extent of this impact is the efficacy of CHCs to improve health is to be believed.

5.1 Comparison of values and norms

The South African concept of 'Ubuntu' on which the CHC model is based, is perhaps a universal value for 'common unity' shared with Confucian and Buddhist teaching, common in Vietnam, which recognises that the strength of the individual is contingent on an effectively integrated community with shared norms and values. In Northern Provinces of Vietnam where this pilot project took place, the values of group conformity and consensus have been developed through many years of national communism, which have discouraged individualism, and very 'western' need for self-expression which has been the hallmark of liberal democracy [22]. Instead CHC members in Vietnam readily comply with the recommended practices advocated in the Community Health Club, and there is little resistance to change. It was apparent from the numbers who joined the CHC and completed the training, that the norms cultivated by the Community Health Club resonated strongly with the existing village culture of mass organisations, who readily endorsed the activities and were part of the existing village structures under the wing of the Women's Union, which is found in all villages throughout Vietnam.

5.2 Comparison of facilities

Villages in Vietnam had the advantage of a village hall, the 'Culture House', where CHC meetings could be routinely held despite the weather, meaning that CHC activities were not dependent on the seasons unlike in Africa, where training had to be timed to avoid the wet season when attendance was affected by daily downpours of rain [18]. As meetings could be held at night, they did not take away from more pressing demands of earning a living, and provided a welcome social occasion, an outlet for the creativity and musical talent of many members, who loved to sing, deliver poems and drama for the entertainment of the whole village. With electricity and a public announcement system, the Culture Houses provided a ready means to disseminate health messages over the entire village. This sophistication would be a welcome enhancement for CHCs in Zimbabwe, where CHC meet under a tree.

5.3 Comparison of human resources

Unlike many countries in Africa, where finding facilitators within the community to run the CHC is often a challenge, every village in Vietnam already has a well-trained Village Health Worker (VHW) who usually has a basic training in primary health. In addition instead of local volunteers, VHWs in Vietnam often have a motorbike and are supported by government with a small stipend to ensure that they can sustain such community commitment. As such Vietnam is in the same league as Rwanda, the only country in Africa to adopt the CHC model into a national Community Based Environmental Health Promotion Programme, where CHCs have been started in every village in the country, under the existing staff of the Ministry of Health, who supervise Village Health Workers to facilitate health club sessions. The CHC training in Zimbabwe was done by Environmental Health Technicians stationed at each of the Health Centers, in the Makoni Pilot project, with community-based facilitators in the village. Although the National Water Policy [23] and the National Sanitation Policy [24] both call for CHCs in every village, implementation of such programmes is being done by NGOs, most of which have been trained by Africa AHEAD (Zimbabwe AHEAD, as it was from 1999 to 2015) and is not done by District Health Department.

5.4 Comparison of community mobilisation

The mobilisation of the community was as easy in Vietnam as it was in Zimbabwe. The Vietnamese manual [25] was adapted from the Zimbabwean manual [8] both written by the main author. It was translated into the vernacular and a toolkit of culturally appropriate visual aids on which this training depends enabled local Ministry of Health officials to conduct the training through existing government structures. The CHC approach holds special promise in the Vietnamese context as the socialist political system ensures a strong public sector with a vibrant network of mass organisations at community level. In addition, the National Target Programme gives overall coordination in the WASH Sector. Zimbabwe (despite having been the original birthplace of the CHC approach in 1995), still has no data base of the thousands of CHCs which have been started in most districts by over 30 NGOs in the past twenty years. Nor do District Health Departments know which CHC are still active. This is a great pity as much could be done to control cholera and Covid 19 epidemics if this was properly coordinated centrally. The obvious next step would be for CHCs to be mapped and registered

in a national programme such as the Community Based Environmental Health Promotion Programme which has been so outstanding in Rwanda, so that the National Coordinating Unit which should control WASH development, can in fact coordinate NGOs and prevent the wasteful duplication which is the feature of the chaotic CHC implementation in Zimbabwe.

5.5 Adaptation of the African style CHC to SE Asian context

The hallmark of CHC programmes in Africa has been the use of a 'membership card' held by each CHC member which records their attendance of sessions and which is required to be fully completed in order that the member be awarded a certificate. It has been theorised that this is an essential part of the 'magic' of the CHC which attracts and holds a larger number of members [23] than with most other mobilisation strategies such as CLTS or PHAST. However, the authorities in Vietnam did not print or distribute membership cards; nor were certificates awarded for completion of the training to CHC members. The facilitation style in Vietnam was autocratic and didactic with top-down directives for hygiene behaviour and compliance enforced by mandatory directives from village leadership. Whilst African CHC tend to be above 80% women, in Vietnam there was more gender balance with as many men as women attending sessions. However, this perceived advantage meant that it was usually men directing proceedings, with little opportunity for gender equity. With a higher level of literacy in Vietnam, the sessions were more like conventional top-down adult education. The sessions were often done without the use of visual aids, which in many places were not printed in time for most of the training. Therefore, the participatory activities which enable women to find their voice were not done, resulting in women remaining largely passive in the meetings. This is unlike the vibrant meeting in Africa which are notable for the full participation of all women as well as men. It is surmised that in Vietnam, with stricter discipline instilled by years of communism, people are perhaps more accustomed to focus for longer periods of time as instructed, without the attraction of participatory activities and visual aids as is the case in African CHC.

5.6 Time needed to effect such change

High levels of hygiene behaviour were achieved in Vietnam which easily matches some of the best projects in Africa [2]. An interesting addition to the literature is the analysis of how long it took the majority of the CHC members to adopt total sanitation. The data collected in Vietnam shows that with weekly training in a CHC it took *at least four weeks* before the behaviour starts to shift towards zero open defecation, but that within 20 sessions all of the members had either build some sort of latrine (49%) whilst the rest were practicing cat sanitation. This is a relatively fast uptake of sanitation and supports the CHC Theory of Change [17] which advocates for at least six months of regular training in a CHC to ensure high levels of uptake of recommended practices.

In Zimbabwe the data from health centers shows that for *health gains* it needs years, not just months of CHC group pressure, to ensure non risk-hygiene behaviour is maintained and is spread to a critical mass of the population, to ensure gains in prevention of diarrhoea is maintained. Only in Ruombwe ward, the only area with over 80% spread, and nine years of CHC activity, did the number of reported cases diminish and remain low after the end of external project support. There has long been debate as to how much time is needed to achieve hygiene behaviour change. The CHC model has been one of the most thorough of training approaches

arguing for 20–24 weekly sessions [2], whilst PHAST used up to six sessions [9] and CLTS expects to achieve ODF status within two face-to-face sessions with the community [10]. This research therefore supports the call by leading WASH NGOs [26], who are now joined by some esteemed academics [27, 28], calling for more long-term investment in hygiene behaviour change which is shown to be necessary if any effect on diarrhoea is to be seen through WASH interventions.

5.7 Reduction of disease

In Vietnam the reduction of diarrhoea, dysentery and food poisoning as a direct result of this pilot project was evident in Health Center records, which provides preliminary indication of some effect of the CHC on health. The fact that in the control non-CHC communes DD & DP actually *increased*, while it decreases significantly in all CHC communes gives a preliminary indication of some impact. Project monitoring reports further convey a strong pattern of sanitation and hygiene behaviour change is still believed to be efficacious in the prevention of diarrhoea [29].

5.8 Cost-effectiveness of the CHC model in Vietnam

The CHC methodology can calculate cost-effectiveness because the exact number of beneficiaries and their attendance of health sessions is known. Costs in the first year of a programme are usually higher as training materials need to be printed, but once facilitators are equipped with toolkit and transport, cost per beneficiary should decrease.

It could have been more efficient if Village Health Workers had more than one CHC to run each, as the Zimbabwean facilitators were full time, coordinating five or more health clubs per week. Also, much expenditure went on the printing billboards and posters in Vietnam which is not needed for CHC. The amount of US$ 1.30 for health promotion per person per year is still low and comparable with most CHC projects in Zimbabwe and well under the target in 'Classic CHC' Programmes of less than US$5 per beneficiary per annum for hygiene behaviour change (not including water or sanitation subsidy). With number of cases saved through safe hygiene, there is little doubt that Community Health Clubs are almost always 'low cost - high impact'.

5.9 The methodological debate

We are receiving mixed messages in recent literature on the effectiveness of WASH to reduce diarrhoea and the jury is still out as to exactly which methodology is able to change people's habits in the long term to ensure non risk hygiene and sanitation behaviour. Whilst the Burden of Disease attributable to WASH has apparently been reduced from 4.2% to 1.5% in the last 30 years [3], some recent trials has led to experienced practitioners in the public health sector to question whether WASH interventions are in fact impacting on diarrhoea [30]. Our limited research indicates that comprehensive WASH programmes such as was done in Zimbabwe and Vietnam does lead to reduction in diarrhoal disease.

6. Conclusion

Whilst epidemiologists and trialists struggle with high end statistical data, to inform the Environmental Health Departments of Ministries of Health on the efficacy of community interventions designed to prevent diarrhoea, the *curative*

wing of Ministry of Health continues to rely simply and systematically on the number of reported cases at Health Centres to indicate trends in the burden of disease. These trends over time may be more reliable than snapshot interventions of clustered-randomised control trials which seldom have enough time to understand the dynamics of community response. Whilst the routine data we present here has obvious limitations in that it may fail to represent the *full* disease burden, with the crisis of reliability in the WASH literature in the past few years, we may find that watching the pattern of reported cases in the catchment area of an intervention over time may be the nearest we can get to assessing impact on health by such interventions as a Community Health Club programme.

Acknowledgements

In Vietnam, the main author was funded as a consultant by DANIDA 2009-2010 in collaboration with the Ministry of Health and acknowledges the input of local consultants and officials.

In Zimbabwe, the pilot project in Makoni District from 1999 to 2001 was funded by DANIDA in collaboration with the Ministry of Health, and we acknowledge the efforts of Environmental Health Department which was the main implementor of this programme.

Thanks also to Zimbabwe AHEAD (now Africa AHEAD) for quality of training and support to Makoni District.

Conflict of interest

The corresponding authors is the original architect of the CHC Methodology and therefore has obvious bias.

Author details

Juliet Waterkeyn[1]*, Victor K. Nyamandi[2] and Nguyen Huy Nga[3]

1 Africa AHEAD Association, Cape Town, South Africa

2 Food Safety and Port Health Services, Ministry of Health and Child Care, Harare, Zimbabwe

3 Faculty of Public Health and Nursing, Quang Trung University, Quy Nhon City, Vietnam

*Address all correspondence to: juliet@aficaahead.com

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