Acting Against Worms Evaluation Report

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Summary

Acting Against Worms (AAW) is a drama-based initiative aimed at improving understanding and public engagement with health messages related to preventing and controlling schistosomiasis and intestinal worms amongst rural communities in Uganda. AAW, a collaboration between the Schistosomiasis Control Initiative (SCI), the Ugandan Ministry of Health and Theatrescience, was carried out in Busia district in Eastern Uganda which is endemic for schistosomiasis and intestinal worms. Cluster randomisation was used to assign nine schools to an intervention arm and nine schools to a control arm. The schools in the intervention arm received training and advice from drama practitioners on how to research, develop and perform dramas which have a health education message about prevention and control of schistosomiasis and intestinal worms. Before the national treatment campaign the pupils performed these dramas to their schools and also to the wider community at a drama festival. The control arm received standard health education messages through the national control programme. Changes in knowledge, attitudes and practices (KAP) were measured before and after the intervention in both arms of the study. Results and perceptions from the project and studies will be fed back to the communities using pupils and community members to improve public engagement in research.

Introduction

World leaders have determined to make strong and sustained efforts to reduce extreme poverty, as set by the 2000 United Nations Millennium Declaration and reaching the ambitious eight Millennium Development Goals (MDGs; www.un.org/millenniumgoals). Progress has been made towards these MDGs and in particular MDG 6, which aimed 'to Combat HIV/AIDS, Malaria, and Other Diseases' (Fenwick and Webster, 2006; Paul, 2008). Schistosomiasis, or bilharzia as it is sometimes referred to, is one such 'Other Disease'.

Schistosomiasis is a chronic and debilitating disease, second only to malaria in terms of parasite-induced human morbidity and mortality. It continues to threaten millions of people, particularly the rural poor in the developing world. Of some 779 million people exposed, an estimated 200 million are infected, more than half of which are symptomatic and at least 20 million exhibit severe disease manifestations (Steinmann *et al.* 2006). The adult schistosome worms, the causative agents, inhabit the blood vessels of humans, and an asexual reproduction stage occurs in specific aquatic and amphibious snails. Human infection with *Schistosoma mansoni* is associated with chronic hepatic and intestinal fibrosis, whilst *S. haematobium* infections can lead to ureteric and bladder fibrosis, and calcification of the urinary tract. Theses two species of schistosomes which are prevalent in sub-Saharan Africa are responsible for a great burden on human health, and some 280,000 deaths annually (van der Werf *et al.* 2003).

The possible methods available to control schistosomiasis have long been recognized as improved water supplies and sanitation, snail control, and preventive chemotherapy for infections in the

human host (WHO Expert Committee, 1993). Provision of clean water supplies and improved sanitation to the poorest communities is still lacking, and snail control has proved to be difficult, expensive and/or environmentally unacceptable. Preventive chemotherapy has emerged as the major tool, because it is a safe and low-cost intervention producing a rapid impact in terms of reducing intensity of infection, and thus morbidity (Fenwick and Webster, 2006). Currently, preventive chemotherapy is the mainstay of the World Health Organization (WHO)-recommended strategy against schistosomiasis as described in their manual (WHO, 2006).

Since 2002, there has been an upsurge in efforts to control schistosomiasis in Africa. One of the first African countries to launch a national-scale schistosomiasis and intestinal helminth control programme was Uganda in 2003. The Ugandan Ministry of Health (MoH) received five years of financial and technical support from the Schistosomiasis Control Initiative (SCI) to implement the control programme (Kabatereine *et al.,* 2006a). Since 2008 the Ministry of Health programme for controlling schistosomiasis and intestinal helminths has been integrated into the overall Neglected Tropical Disease (NTD) control programme supported by USAID (Linehan *et al.* 2011). The programme is run vertically, implemented by districts using school teachers and volunteers known as community medicine distributors (CMDs). The aim of the programme is morbidity control and the delivery strategy is through mass annual anthelmintic treatment targeted at school-aged children and high-risk groups in the endemic areas using praziquantel to treat schistosomiasis and albendazole to treat soil-transmitted helminth (STH) infection (Kabatereine *et al.,* 2006a, 2006b). Preventive measures focused on raising awareness about schistosomiasis and STH and health education primarily in schools but also in wider communities (Fleming *et al.,* 2009).

Health education from the programme to the communities has primarily been through the use of Information Education and Communication (IEC) materials developed by the MoH, WHO and other international organisations such as Chepe which produces booklets and cartoon-style story books; MoH film vans showing short educational films about schistosomiasis and intestinal worms infections were used between 2003 and 2006; and radio programmes on schistosomiasis and worm control are aired during the annual mass treatment campaigns.

Although these media are utilised and have a degree of success, there are still gaps in knowledge and understanding in how to prevent schistosomiasis, which can lead to several consequences including lowered treatment coverage (Parker *et al.,* 2008). Parker and colleagues (2008) surmise that the gaps exist because these health education media are too focused on the biomedical explanations of the disease and take the form of telling the reader how to think and behave rather than understanding the local context of the disease and existing behaviours.

Without behaviour change through appropriate delivery of health education, sustainable control of schistosomiasis and intestinal worms will not be achieved. Drama has proven to be a very effective means of communication within communities and in particular the youth in Africa (Harvey *et al.,* 2000; Onyango-Ouma *et al.,* 2005; Middelkoop *et al.,* 2006; Kamo *et al.,* 2008). This is because those creating the dramas use clear information which is in context of local culture. Furthermore, health education through drama is not impeded by the same logistical limitations that are encountered when using film vans e.g. unavailability of roads and fuel for generators.

Acting Against Worms (AAW) was a collaboration between SCI, the Ugandan MoH and Theatrescience, a UK based organisation which aims to engage new audiences with scientific thinking and bring informed scientific debate into theatrical spaces, as well as encouraging scientists to develop their skills in communicating with those outside their own fields. The AAW partnership aimed to support and encourage long term behavioural change in rural Ugandan communities through the medium of drama. By providing appropriate information, education and communication (IEC) not only to high-risk individuals such as school-aged children but also by these children as peer educators, it was anticipated that the wider community would analyse current behaviour towards preventing and taking treatment for, schistosomiasis. If positive effects were realised, it was expected that programme ownership would be improved and communities encouraged to continue taking drugs for treatment. Additionally, any improvement in sanitary behaviour would not be confined to the communities where it had begun but would be adopted by neighbouring communities.

Aims & Objectives

The overall goal of this project was to encourage behavioural change for worm control through engaging school children and teachers in developing their own drama productions. Participants explored causes and preventions of schistosomiasis through developing plays with the assistance of professional drama producers from Theatrescience and a local Community Based Organisation (CBO) known as the Masafu Post-Test Club who have previously created local plays for encouraging HIV testing. Intervention schools performed before an audience of other schools and local communities at a festival. Changes in knowledge, attitudes and practices (KAP) were measured pre and post drama production and in addition, the capacity of school and community involvement and the major constraints that hindered maximum participation were evaluated.

The overarching aim was public engagement by school-children and teachers researching the biomedical and local understandings of the worm infections for developing their plays and involving a community audience. In addition, the schools and communities would be involved in communicating the KAP study outcomes.

Aims:

- To facilitate Ugandan children in *understanding the importance of modifying their daily behaviour* to decrease risk of infection with schistosomiasis and intestinal worms
- To *effect change* in behaviour towards prevention of infection and treatment in the short and long term and to improve the chances of a healthy and productive childhood and adulthood
- To *promote engagement* with fundamental health messages related to schistosomiasis and intestinal worms through the production of dramas, developed by Ugandan school-age children and their teachers
- To *stimulate discussion and awareness amongst rural communities* about how intestinal worms and schistosomiasis infection is prevented and treated
- *To encourage the young people taking part to become ambassadors in their schools and wider communities* for good practice with regard to decreasing the risk of infection

Objectives:

- To build, in rural teachers and schoolchildren, the capacity to research, write and produce short dramas with health messages for the prevention and treatment of schistosomiasis and intestinal worm infection
- Short dramas performed by schoolchildren to neighbouring schools and communities
- To determine the impact of health education through drama on knowledge, attitudes and practices in comparison to communities with no exposure to the dramas
- To engage the schools and communities in dissemination of the research results to the wider community

Research Question:

Can knowledge, attitudes and practices change towards the prevention and control of schistosomiasis and intestinal worms be achieved through the increased engagement of schoolchildren and teachers in health education using the medium of drama?

Study Plan

Study Areas

The study was conducted in the schistosomiasis endemic subcounties of Lunyo and Lumino in Busia district which lie on the shore of Lake Victoria in south-east Uganda (see Figure 1). Busia district is populated by the Basamia people whose main sources of livelihood are fishing in Lake Victoria and subsistence agriculture. The fishing industry employs a large number of people in the district and a significant number of Busia residents are also employed in cross-border trade with Kenya. The estimated population of 248,100 in Busia are unevenly distributed with areas in the South and along the Kenyan border more densely populated than the north and the west of the district.

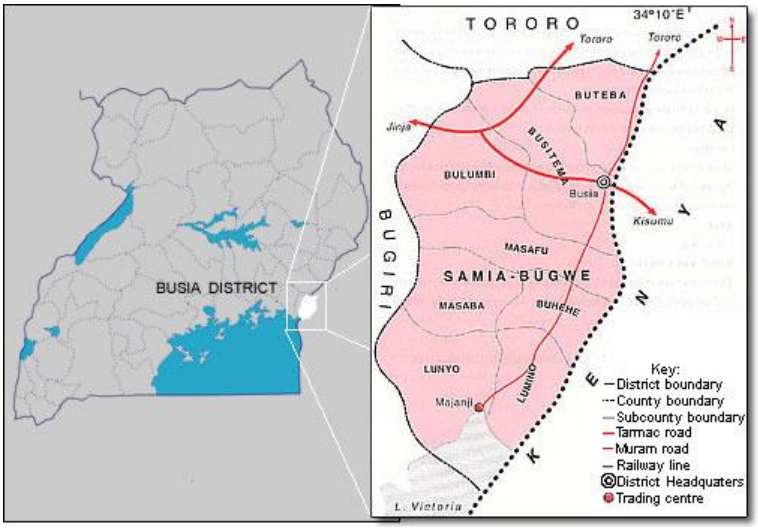

Figure 1. Map of Uganda showing location of Busia district (inset)

Study population

The study was carried out in eighteen schools and their neighbouring communities in Busia district. The health education through drama in the intervention arm was carried out by schoolchildren aged

10 -15 years and targeted their peers and the wider community. In the control arm schoolchildren aged 10-15 years received the standard health education through the national programme which is through teachers, leaflets and comics where available.

Sampling of study population and size

The study used a cluster randomised trial (CRT) design and the unit of implementation (cluster) was the school (and two nearest communities) rather than individuals however, the outcomes were measured in individuals. By using the CRT the potential for contamination of information about the intervention in individuals is greatly reduced. In each arm of this study (intervention and control) there were nine clusters. The clusters were randomly allocated to the intervention or control arm. In each cluster in the intervention arm two school teachers were selected from those with drama, science and, or, English or music background, and a maximum of 20 pupils from classes P6 to P7 (approx ages 10 – 15yrs). Thus a total of 18 teachers and 180 pupils were involved in developing and performing the dramas. In each of the clusters structured questionnaire interviews were carried out in 50 children per school in classes P5/P6 (10 -15 yrs) who were followed up longitudinally two months post-intervention with the same questionnaire. A selection of community members participated in focus group discussions at baseline and post-intervention.

Sample size calculations

Sample sizes were calculated using the appropriate formula for cluster-randomised trials (Hayes and Bennett, 1999). The objective was to compare the proportion of individuals with the outcome of interest in the intervention and control groups (clusters). The following assumptions were made based on literature searches and previous research in Busia district:

- Expect to see a 10 to 15% difference in the outcome (% change in KAP) between the two study arms
- Baseline knowledge of schistosomiasis and STH would be >80% in schools and communities, awareness of how individuals become infected may also be high (~70%) however, knowledge of why prevention and treatment is important is approximately 60%. It is the latter that we wanted to improve through the drama activities.
- The feasible number of children that could be sampled for the KAP questionnaires in two schools each day for reasons of logistics and costs were 50, thus n = 50.

To detect these changes it was calculated, using the following equation, that nine clusters in each arm were required:

$$c = 1+(Z_{\alpha/2}+Z_{\beta})^2 [\prod_0(1-\prod_0)/n+\prod_1(1-\prod_1)/n+k^2(\prod_0{}^2- \prod_1{}^2) / (\prod_0- \prod_1)^2$$

where α = significance level of 0.05

β = 80% power

$\prod_0$ = without intervention

$\prod_1$ = without intervention + 10% or 15%

n = 50

k = coefficient variation between schools $\sigma_v^2 = Var(v_{0k})$ 0.122 (Koukounari *et al.* 2006)

For the purposes of the qualitative Focus Group Discussion (FGD) survey, fewer participants were required than for the KAP questionnaire survey. The participants for the FGDs were selected from specific villages in Lunyo and Lumino subcounties. There were six FGDs held for each arm of the study making 12 FGDs in total. In each arm three FGDs were held with women and three FGDs were held with men. The community members were selected from the two villages which are nearest to each of three schools in the intervention arm and three schools in the control arm. These schools were randomly selected from the 18 schools in the study. From the two villages the aim was to have 6 to 12 people participating in an FGD (i.e. six from village 1 and six from village 2). Thus, with 12 FGDs there would be approximately 72 to 144 participants.

Methods

Initial meetings were held with the head teacher at each of the selected intervention schools describing the purpose of the project and what would be expected of them if they were willing to participate. Their verbal consent was then given and teachers with relevant experience to participate selected.

Drama

The use of drama as a medium for health education about prevention and treatment of schistosomiasis and intestinal helminths was the main component of the Acting Against Worms pilot project. However, it was soon realised that to cover all the biomedical information and corresponding treatment and prevention practices for schistosomiasis and the intestinal helminths would be too confusing for the participants and potentially the audience and the focus shifted to concentrate on schistosomiasis only. The drama exercise was led by experienced drama practitioners from Theatrescience and was implemented through:

- *Inset Workshop with Teachers - Oct 2009*

Two teachers from each of the nine intervention schools received information through a one day 'inset' training led by Theatrescience in partnership with the Masafu drama group and the District Vector Control Officer (DVCO) for Buisa, Robert Mulimba. Teachers were introduced to the aim and objectives of the AAW project and discussions were held on both the biology of schistosomiasis and intestinal worms and, the potential dramatic expression of preventive measures against the diseases were explored. The teachers were informed what was expected of them and their children at school in creating ten minute plays, to be performed at a central festival, about the prevention and treatment of the diseases. The teachers were also taught 'Applied Drama'* and example models of work were introduced. A **Teacher's Briefing Pack** and **Teacher's Workshop Pack** (see appendices 1 and 2) were provided including guidance notes to accompany the workshop.

* 'Applied Drama' is the use of drama and theatre not just for entertainment but for information and public engagement, in this case with public health issues.

- *School Workshops – Oct 2009*

Following the Inset Workshop each of the nine intervention schools were visited in turn and 2 hour workshops facilitated by Theatrescience and Masafu drama group were held with the teachers and 20 children randomly selected from classes P6 and P7. The workshops introduced and explored drama techniques which could be used to explore and express biological information and public

health messages. Particular emphasis was given to storytelling exercises and activities based on making physical images to communicate narrative. The workshops also included the sharing of local songs and dances. The DVCO and the SCI programme manager were present for communicating schistosomiasis life-cycle and prevention of infection health information. Finally two students at each school volunteered to lead their group to devise and write their own scripts with assistance from their teachers and visits from the Masafu drama group. Stamped airmail envelopes were left with these students to send copies of their scripts to Theatrescience by the end of the year. The workshops were held in English but the dramas were to be developed in Lusamia-Lugwe or English depending on the schools preference.

- *School Presentation Development - Nov 2009 to March 2010*

Following the school workshops each school devised and rehearsed their own performance pieces about, its prevention and, the importance of taking the annual treatment provided by the Ministry of Health. The schools were supported by visits from Masafu drama group and the Busia DVCO. The scripts were received, typed up and adapted into scenario form by Theatrescience with the biological and health information checked for correctness by SCI (see Appendix 3). The adapted scripts were then emailed to the Busia DVCO who distributed back to the relevant students via Masafu drama group who assisted in turning the scripted scenarios into a fully realised performance.

- *Show Doctoring – April 2010*

Prior to the central Drama Festival presentation of these performance pieces, Theatrescience and Masafu drama group re-visited each school to advise and 'show doctor' as necessary. Any technical/production matters were also addressed. The show doctoring sessions took about 3 to 4 hours per school and were frequently witnessed by other pupils. All nine schools performed their final dramas in front of their fellow pupils and teachers at school.

- *Central Drama Festivals – 10th April 2010*

The five best dramas were selected and their school asked to participate in the Central Drama Festival to perform to the wider community. Special invitees included parents, local district health and education authorities, health workers, and NGOs. April was the target month for the festival as this is the annual treatment period for schistosomiasis and intestinal worms through the Ministry of Health's Child Health Days campaign.

The festival was held at Bwanikha Primary School which was deemed accessible to all the schools performing and the invited guests. Local dignitaries gave speeches between the performances to the more than 300 people who attended the festival. The performances themselves were being scored by two local adjudicators and Sirere Primary School was deemed to be the best performance of the day; they were rewarded with a goat, two footballs and two netballs. All other intervention schools were awarded with footballs, netballs and sweets. Each school also, later on, received a certificate to document and thank them for their participation in the AAW project.

The inset days, workshops, show doctoring and final performances were filmed by Jeff Teare (Theatrescience) and podcasts developed from recordings and interviews by Becky McCall (SCI consultant) and have been posted on the websites of SCI (www.sci-ntds.org) and Theatrescience (http://www.theatrescience.org.uk), YouTube (www.youtube.com), on the Health Exchange website (http://healthexchangenews.com/2010/06/17/bilharzia-why-the-drama-2/) and on the Soul Beat

Africa website http://www.comminit.com/?q=edutain-africa/node/320777. Journalists from national Uganda newspapers attended and reported on the central festival http://www.newvision.co.ug/D/8/17/716125 .

Knowledge, Attitudes and Practices Study

Knowledge, Attitudes and Practices (KAP) towards the prevention and treatment of schistosomiasis was measured in schoolchildren using structured KAP questionnaire interviews and in the communities using focus group discussions (FGDs).

KAP Questionnaire: The structured questionnaire interviews included demographic detail, beliefs about schistosomiasis, its transmission and prevention methods and about the social responsibilities of taking annual treatment (see Appendix 4). The interviews were carried out with 50 randomly selected children in each school in the intervention and the control arms. In each school a list of enrolled schoolchildren in classes P6 and P7 (age range 10 – 15 years) was made and each pupil assigned a number. A random number generator was then be used to select the 50 children to be interviewed using the KAP questionnaire. The questionnaires were translated from English into Lusamia-Lugwe and then back-translated to check for consistency. They were first pre-tested and then appropriate minor alterations made. The interviews then took place in Lusamia-Lugwe and any 'other' responses translated into English after the field work was completed.

Focus Group Discussions: The purpose of the FGDs was to identify what the participants think and, how and why they think the way they do about prevention and treatment of schistosomiasis. The participants were information rich people who were identified from each village by the local leaders. The FGDs were conducted in convenient public places identified by the village leaders. The discussions were guided by preset open ended questions which were followed by probes to enable discussions within the group and not to create a group interview. Consensus amongst the group members was not sought; instead all unique ideas expressed by the individual participants were captured.

Each FGD was managed by two research team members one of whom was the moderator while the second one was the note-taker. The moderator stimulated the participants to actively discuss the topics provided and not to just provide answers and controlled the group to proceed in the direction that the focus group took. The note-taker recorded the key issues emerging and other factors such as non-verbal responses e.g. head nodding in agreement, laughing. A tape-recorder was used to record the discussions which were conducted in Lusamia-Lugwe. The note-taker and moderator transcribed the FGDs in the Lusamia-Lugwe before translating to English at the end of each day for use in the analysis. All the researchers were trained in the use of the FGD guide and best practices for FGDs and the number of moderators was restricted to reduce on interview bias. The FGD guide and open-ended questions were first translated and back-translated before the group discussions began.

The KAP interviews with pupils were repeated with the same individuals within two months of the drama festival (minimising recall bias). The FGDs with community members were also repeated within four months of the festival, however, the same community members were not targeted as loss to follow-up has been experienced as high during previous surveys in Uganda. The methods

were repeated to measure any changes in KAP from the baseline survey and to determine any difference between the intervention and control schools and communities post-intervention.

Public Engagement

Ongoing biomedical research on schistosomiasis and intestinal worms in Busia district by the MoH and SCI is analysed at the national and international level. The results are then circulated to stakeholders who include district health teams. However, the results and interpretation are rarely, if ever, communicated to the communities who have been the research subjects. AAW aims to change this trend by using the schools and communities that have played a role in the drama exercise to not only disseminate results, but also to advise about changes to improve the methodology. By engaging the community in evaluation of the dramas, people will gain a sense of ownership to the whole process which should facilitate scaling up and sustainability. It is anticipated that the communities will appreciate the importance of the research and the need for their active participation. This dissemination of findings will take place in July and August 2011.

Data Analysis

Assessment of change in knowledge, attitudes and practices was based on a change in measured indicators quantitatively through the KAP questionnaires and qualitatively through the FGDs. The KAP questionnaire was double-entered using Excel version 2003 (Microsoft, Redmond, WA). Verification, data cleaning and analysis were conducted using STATA version 11 (Stata, College Station, TX). Preliminary analyses comparing the proportions of intervention and control arms at baseline and follow-up were conducted using z-tests and logistic regression, however these techniques assume that the individual observations are statistically independent of each other. As this study design was cluster-randomised and the intervention was allocated at the level of the school rather than the individual, the outcome measurements on individuals within the same school are likely to be correlated with each other. By failing to take this lack of independence into account estimated standard errors will be too small, leading to confidence intervals that are too narrow and p-values that are too small i.e. we would think our evidence is stronger than it is. To take into account this lack of independence, random effects models were used to include the variation between clusters explicitly in the likelihood and thus model explicitly the between-cluster variance.

The translated FGDs were transcribed and typed up into Word version 2003 (Microsoft, Redmond, WA). Themes were identified and codes established by reading through several transcripts. Subsequent transcripts were coded according to these themes and organised using the qualitative software package Nvivo7 software (QSR International).

Ethical Considerations

Informed consent was obtained from all those participating in the dramas at each school. For the individuals that were involved in the structured questionnaire interviews and focus group discussion the nature of the research was clearly communicated by advance visits to the communities by research staff to explain the objectives of the study, before the interviews and discussions are begun informed consent was obtained.

All confidential information is kept in a safe secure location at Vector Control Division, Kampala. Ethical approval for this research has been approved by the Ugandan National Council of Science and Technology and Imperial College London.

Results

Characteristics of pupils and schools

The characteristics of the pupils and schools involved in the KAP survey are presented in Table 1. There was a considerable loss to follow-up between baseline and follow-up in both study arms (43.1% intervention arm, 47.7% control arm) however this did not result in a significant difference between the two arms (P = 0.6894). Both gender and age were similar between the arms at baseline and again at follow-up. Reasons for visiting the lake were based on multiple answers given by the students during the questionnaires with the primary reasons being domestic chores (washing clothes, collecting water) and cooling off. Almost all pupils responded that they had a latrine in their home compound and at school, and all of them confirmed that they used the latrine. There were also a very high proportion of pupils who declared that they had received treatment for schistosomiasis in the intervention (96.0%) and control (97.6%) schools.

Table 1. Characteristics of pupils and schools in Knowledge, Attitudes and Practices survey

	Baseline		**Follow-up**	
	Intervention	Control	Intervention	Control
Pupils				
All	450	450	256	249
Female	221 (49.1%)	215 (47.8%)	120 (46.9%)	121 (48.6%)
Age (years)	13.7 (1.3)	13.8 (1.2)	13.6 (1.3)	13.7 (1.2)
Reason for visiting lake				
washing clothes	226 (43.4%)	189 (33.8%)	129 (38.2%)	93 (31.5%)
collect water	97 (18.6%)	162 (29.0%)	79 (23.4%)	109 (36.9%)
cooling off	93 (17.9%)	106 (19.0%)	98 (29.0%)	70 (23.7%)
playing	36 (6.9%)	50 (8.9%)	11 (3.3%)	3 (1.0%)
fishing	38 (7.3%)	42 (7.5%)	12 (3.6%)	16 (5.4%)
bathing	15 (2.9%)	6 (1.1%)	8 (2.4%)	4 (1.4%)
defecating	16 (3.1%)	4 (0.7%)	1 (0.3%)	0
Latrine in home compound*	441 (98.0%)	442 (98.2%)	255 (99.6%)	246 (98.8%)
Latrine at school*	443 (98.4%)	446 (99.1%)	255 (99.6%)	244 (98.0%)
Taken treatment for schistosomiasis	432 (96.0%)	439 (97.6%)		
Schools				
All	9	9	9	9
Enrolment	595 (384 – 818)	849 (358 – 1265)		
Distance from lake	4 schools >5km 5 schools <5km	4 schools >5km 5 schools <5km		
Safe water coverage**	50.1%	64.9%		

Data are n (%), mean (SD), median (range)

*100% of those that reported a latrine at home or at school confirmed that they used the latrine

**s*ource*: Busia District Budget Framework Paper for 2008/9

The 18 schools recruited into the study at baseline all participated in the follow-up KAP survey. The enrolment rate in the control schools was higher than the intervention arm. However, there were an equal number of schools that were further and nearer than 5 kilometres from Lake Victoria in each

study arm. Safe water sources such as functional boreholes and protected springs were incorporated in the estimation of safe water coverage with the assumption that one borehole serves 300 people and one protected spring serves 150 people. There is higher coverage of safe water in the control arm than the intervention arm (64.9% versus, 50.1%; P = 0.4562).

Pupil knowledge, attitudes and practices on schistosomiasis

Data on pupil knowledge, attitudes and practices were derived from the KAP survey. Table 2 presents data on either the response 'yes' or correct responses given by the pupils and not on the answer no or any incorrect answers given. Safe water sources in this instance were those where you would not be at-risk of schistosomiasis infection for example, boreholes, protected and unprotected springs and well. Unsafe water sources were the lake, ponds, rivers and swamp. The baseline awareness of schistosomiasis was high (93.1% versus 94.2%), which is slightly higher than predicted (80%) during the sample size calculations and there was no increase in pupil's awareness in the arm that had received the drama intervention compared to those who had not (OR = 1.3, 95% CI: 0.3, 5.9; P = 0.736). When asked how they had heard about schistosomiasis, pupils responded with multiple answers, with the majority having heard from teachers and family members. At baseline there was a difference between the two arms in respect to the proportion that had heard through teachers (OR = 0.5, 95% CI: 0.4, 0.8; P = 0.001) and again at follow-up between the two arms (OR = 0.4, 95% CI: 0.2, 0.7; P = 0.003), with a higher proportion of those in the intervention arm having heard from teachers. Further analysis also shows that there was an increase in this proportion between baseline and follow-up (P = 0.018). Following the drama intervention there was a significantly higher number of pupils that had heard about schistosomiasis through a school announcement than in the control arm (OR = 0.2, 95% CI: 0.1, 0.8; P = 0.028).

Post intervention there was no significant difference between the intervention and control pupil's responses to whether they had ever suffered from schistosomiasis, however, those reporting that they had, had decreased in both groups between baseline and follow-up (P = 0.008). Knowledge on how you get infected, with schistosomiasis, was higher in the pupils who received the drama intervention at follow-up (OR = 0.5; 95% CI 0.3, 0.9; P = 0.025), however the same was true at baseline (OR = 0.4; 95% CI 0.2, 0.7; P = 0.001). There was a less of an understanding about how schistosomiasis is actually transmitted at baseline (64.4% intervention versus 37.6% control) with many students in both arms giving incorrect answers such as drinking contaminated water, eating dirty or raw food and sharing utensils. There was no statistical increase in this understanding in the intervention pupils at follow-up, however, further analysis showed that there was an overall increase in knowledge of transmission in both arms at follow-up compared to follow-up (OR = 1.6; 95% CI 1.1, 2.3; P = 0.01).

Pupils in both arms stated that schistosomiasis could be prevented at baseline and follow-up, and multiple answers were given on how it could be prevented. At baseline not bathing or swimming in contaminated water, collecting water from a safe water source, not defecating in water and treatment were the most frequent responses (48.2%, 38.0%, 37.8%, 26.7% and 24.9%) for prevention in the intervention group and these were all statistically different from the proportion of responses in the control group. At follow-up there was also difference between proportions of pupils reporting that collecting water from a safe water source and not defecating in water, as methods of prevention, with an increased proportion in the

Table 2. Baseline and Follow-Up Knowledge, Attitudes and Practices survey

Questions	**Baseline**					**Follow-up**				
	Intervention	Control	OR	95% CI	*P*	Intervention	Control	OR	95% CI	*P*
Use safe water source	331 (73.6%)	321 (71.3%)	0.9	(0 .3, 2.9)	0.853	215 (84.0%)	189 (75.9%)	0.7	(0.2, 2.8)	0.570
Schistosomiasis and transmission										
Heard of schistosomiasis	419 (93.1%)	424 (94.2%)	1.2	(0.7, 2.1)	0.494	252 (98.4%)	245 (98.6%)	1.3	(0.3, 5.9)	0.736
How heard - *teacher*	262 (58.2%)	193 (42.9%)	0.5	(0.4, 0.8)	0.001	204 (79.7%)	155 (62.3%)	0.4	(0.2, 0.7)	0.003
- *family*	201 (44.7%)	121 (26.9%)	0.5	(0.3, 0.7)	<0.001	85 (33.2%)	105 (42.2%)	1.5	(1.0, 2.3)	0.081
- *friend*	104 (23.1%)	71 (15.8%)	0.6	(0.4, 1.0)	0.06	25 (9.8%)	20 (8.0%)	0.8	(0.4, 1.7)	0.552
- *CHW*	72 (16.0%)	83 (18.4%)	1.2	(0.8, 1.9)	0.413	57 (22.3%)	54 (21.7%)	1.0	(0.6, 1.6)	0.911
- *school*	74 (16.4%)	71 (15.8%)	1.0	(0.7, 1.4)	0.786	49 (19.1%)	12 (4.8%)	0.2	(0.1, 0.8)	0.028
- *political*	25 (5.6%)	17 (3.8%)	0.7	(0.4, 1.3)	0.209	20 (7.8%)	10 (4.0%)	0.5	(0.2, 1.6)	0.260
- *radio*	9 (2.0%)	23 (5.1%)	2.4	(0.7, 8.5)	0.164	20 (7.8%)	22 (8.8%)	1.2	(0.5, 2.6)	0.685
- *comic*	10 (2.2%)	16 (3.6%)	1.6	(0.7, 3.9)	0.283	22 (8.6%)	24 (9.6%)	1.3	(0.5, 3.5)	0.628
Ever suffered schistosomiasis	102 (22.7%)	73 (16.2%)	0.7	(0.4, 1.1)	0.147	10 (3.9%)	27 (10.9%)	2.5	(0.8, 7.4)	0.107
How are you infected	376 (83.6%)	300 (66.7%)	0.4	(0.2, 0.7)	0.001	197 (80.0%)	153 (61.5%)	0.5	(0.3, 0.9)	0.025
How is schistosomiasis transmitted	290 (64.4%)	169 (37.6%)	0.3	(0.2, 0.5)	<0.001	127 (49.6%)	111 (44.6%)	0.8	(0 .5, 1.3)	0.439
Prevention and treatment										
Can schistosomiasis be prevented	413 (91.8%)	399 (88.7%)	0.6	(0.3, 1.0)	0.046	246 (96.1%)	240 (96.8%)	0.6	(0.1, 5.1)	0.660
How prevented - *no bathing*	217 (48.2%)	84 (18.7%)	0.2	(0.1, 0.4)	<0.001	38 (14.8%)	50 (20.1%)	1.5	(0.7, 3.3)	0.292
- *collect safe water*	170 (37.8%)	125 (27.8%)	0.6	(0.4, 0.9)	0.012	90 (35.2%)	45 (18.1%)	0.4	(0.2, 0.8)	0.006
- *no defecating in water*	120 (26.7%)	68 (15.1%)	0.5	(0.3, 0.7)	<0.001	117 (45.7%)	46 (18.5%)	0.3	(0.2, 0.5)	<0.001
- *no swimming*	171 (38.0%)	67 (14.9%)	0.3	(0.2, 0.5)	<0.001	63 (24.6%)	66 (26.5%)	1.1	(0.4, 2.6)	0.879
- *treatment*	112 (24.9%)	162 (36.0%)	1.7	(1.2, 2.4)	0.003	58 (22.7%)	73 (29.3%)	1.8	(0.7, 4.9)	0.248
- *water treatment*	28 (6.2%)	29 (6.4%)	1.0	(0.6, 1.8)	0.891	59 (23.1%)	51 (20.5%)	0.9	(0.4, 1.8)	0.704
- *health education*	24 (5.3%)	45 (20.0%)	2.1	(0.9, 4.8)	0.075	28 (10.9%)	36 (14.5%)	1.5	(0.6, 3.4)	0.380
Do you need treatment if no signs	397 (88.2%)	333 (74.0%)	0.4	(0.3, 0.6)	<0.001	231 (91.7%)	218 (87.0%)	0.7	(0.4, 1.2)	0.167

Odds ratios and p values of comparisons between intervention and control arms are derived from multi-level modelling (random effects models) which adjust for clustering

intervention arm (OR = 0.4; 95% CI 0.2, 0.8; P = 0.006 and OR = 0.3; 95% CI 0.2, 0.5; P = <0.001). However, further analysis shows that these differences are unlikely to be because of the intervention as there was no significant change between baseline and follow-up (P = 0.411 and P = 0.993). The majority of pupils in both groups reported that there was still a need to get treatment even if you have no signs of infection (91.7% and 87.0%) and there was no increase in the responses in the intervention arm following the drama activities (OR = 0.7; 95% CI 0.4, 1.2; P = 0.167).

Outcomes of Focus Group Discussions

The FGDs were held in the communities neighbouring three of the intervention schools and three control schools. The characteristics of the participants involved at baseline are described in Table 3. The registration data for the follow-up FGDs was not found on return to Kampala from the field, however the groups were populated by similar target populations and it was felt by the study team that there were no major differences in representation.

Table 3. Characteristics of participants in Focus Group Discussions (FGDs) at baseline

	Intervention		**Control**	
	Male	Female	Male	Female
Number of FGDs	3	3	3	3
Participants				
All	30	33	33	28
Age range (years)	21 - 60	17 – 50	20 - 73	23- 60
No. children attend school*	2.7 (1 – 9)	2.6 (1 -5)	2.8 (1 – 8)	2.9 (1 – 10)
marital status - *married*	29	25	31	20
- *single*	1	5	1	1
- *widowed*	-	4	1	7
occupation - *farming*	15	16	14	22
- *fishing*	10	-	13	-
- *trader*	2	2	6	6
- *other*	3	2	1	-
No. having received MoH treatment	23	18	31	21

*Average (range)

The participants of the FGDs showed similar characteristics between the intervention and study arms with their being an average of nine to eleven participants over the 12 FGDs in both male and female groups. Each participant had an average of more than 2 but fewer than 3 children attending school with a range of 1 to 10 children. The majority of the 134 participants were married (84.7%) and were involved in farming (54.0%) and if men, fishing (36.5%). Three-quarters (75.0%) of the participants reported having received free treatment through the Ministry of Health (MoH) programme.

The majority of the responses from the FGD participants in both the intervention and control groups, were similar and thus have been reported below without defining which group they have come from, except for specific quotes. However, topics that came up through the analysis that were distinct to either the intervention or control communities are clearly laid out at the end of each theme heading.

Schistosomiasis and transmission

Each group was asked what their most significant public health problems were and malaria and schistosomiasis were deemed to be the most important alongside diarrhoea/dysentery, tuberculosis and HIV/AIDS by all groups. The Serere women's group felt that the inadequate safe water supply in the area was a serious health problem for the community which meant that more people would use the lake with the consequence of more children being present to defecate and urinate in the lake.

The majority of people use the lake as they live near the shore, however it was felt that fishermen, housewives and farmers without gum boots were most at-risk of schistosomiasis infection and also individuals who drink un-boiled water. Particular families perceived to be most at-risk of infection were families with a large number of children and child-headed families as the children don't know about the dangers of schistosomiasis and they frequently swim in the lake where they urinate and defecate. Also the families which are headed by grandparents, because the parents have passed, were perceived to be at increased risk, because they are too elderly to find clean water sources and use the lake due to its proximity. Finally poorer families were identified by the groups as being at high risk of schistosomiasis infection as they tend to use the lake water more, can't afford to burn the fires to boil it and also that don't have pit latrines in their compounds.

At both baseline and follow-up the groups reported that the signs and symptoms of being infected with schistosomiasis such as loss of weight, vomiting and body weakness were the same in children and adults. Men's groups report that women suffered from blood in the urine, and women reported that men suffered from it, was a common misconception mentioned more during baseline discussions than at follow-up.

The causes and transmission of schistosomiasis were given as stepping in contaminated water and faeces, drinking dirty water; dirty or uncovered food and being in water (bathing, fishing, collecting water) that someone infected has urinated or defecated in. Women's groups also identified person to person contact and sharing dirty utensils as means of spreading the disease both at baseline and follow-up, which the men did not.

Intervention groups

At baseline many of the respondents in Bwanikha mens' FGD felt that the millipedes that live in the water and on the lake shore spread schistosomiasis by bites. These comments were not repeated at follow-up. Only one person, a woman from Sirere mentioned that water snails are involved in the process of transmitting schistosomiasis and this was at follow-up.

Control groups

In contrast, two of three of the men's groups reported the involvement of the water snail in schistosomiasis transmission, one participant in Manjanji men's group described how the snail lays eggs that then contaminate the water and infect people with the worm.

Prevention and treatment

The most commonly reported preventive measures for schistosomiasis by the groups in both arms, were limiting or stopping moving through and swimming in dirty water, drinking boiled water, stopping people from defecating in water, washing hands before eating and taking the drugs for

treatment. In addition, women's groups described that stopping their children from going to the lakes for playing and swimming and to make sure they didn't defecate and urinate in the water was important in preventing schistosomiasis transmission. However it was understood that schistosomiasis persists in the communities and is not being prevented as some people do not follow the teachings and because *'we drink dirty water because we have nothing to do, we do not have boreholes'* (Male FGD, Sirere).

There was a general perception that community leaders sensitise well on the need to use pit latrines and to get treatment when it is being administered. Many of these leaders have also helped to construct boreholes. Nevertheless, the groups highlighted that there was a strong need to teach people that are still ignorant not to defecate and urinate in the water. It was felt that not only the local leaders should be responsible but also community members themselves who should live hygienically in their own compounds and this would spread the message to others to do the same. Each of the women's groups in intervention and control arms responded that as parents you are the ones responsible for setting good standards to your children. The Manjanji men's group identified that the Beach Management Units should be more involved in community education as they have the resources.

Without exception, all groups responded that they needed more '*boreholes drilled and maintained so that we have safe water in this area'* (Male FGD Bwanika) and thus would not have to collect from the lake and would not be pressurised to boil the water when resources to do so are scarce. In addition, that help be provided by the government to 'dig' more pit latrines.

The groups varied in participants reporting they had received the free treatment (50% to 80%) through the Ministry of Health (MoH) programme at baseline and follow-up. They were informed about the programme through the local leaders, health workers and drug distributors and procedures for treatment were always clearly explained e.g. to first take a meal, why it was important to take the drugs, that short-lasting side-effects could be experienced because the drug is killing the worm, that the dose was based on height and weight, and that drugs must be taken in the presence of the drug distributor.

Free treatment was perceived as being good as the communities live on the lake shore and require frequent treatment and because otherwise drugs are too expensive (12,000 Ugandan shillings or £0.40). This cost factor helped to motivate people to take the drugs and also because there is limited availability of the drugs at the health centres and at Masafu hospital where many of the participants reported to have visited had they missed the MoH mass treatment programme due being on the lake fishing or visiting sick relatives in another village. There were statements that there were never enough drugs during treatment and that sometimes people buy the drugs from the drug shop. It was recommended by the participants in the FGDs that the drugs to treat schistosomiasis need to be distributed more than once a year or made available for free in the health centres and hospitals. All groups reported that there were no local remedies for treating schistosomiasis.

The participants who were parents described how they explain the importance of taking treatment to their children as well as why they should not use the lake for defecating and urinating in. The children receive treatment through the schools which the parents are happy with. For those children

not attending school the parents reported taking them to the treatment station or collecting the drugs for them.

The FGDs in both intervention and control arms identified that some people don't go for treatment because they fear the side-effects, such as diarrhoea and dizziness, as the drugs are strong, some fear the size and the smell of the pills, they fear the drugs will make them impotent and some may think it is too far to travel to get them during mass treatment campaigns. Sirere men's group, as well as two other groups, highlighted that those who did not feel they were infected would not go for treatment. For those people families who refuse to take the medicines it was felt that to motivate them the community should sensitise them further and that the government should make more announcements through the radio and through other means such as the posters. At follow-up several of the groups in the intervention arm also mentioned adding drama.

Intervention groups
The Busiime men's group suggested the local leaders needed to provide dramas and videos to help sensitise about the dangers of schistosomiasis infection and transmission.

Control groups
Those in several of the control FGDs recommended that coordination was required between the MoH the health authorities in Kenya so that drugs can be given both sides of the border and this would prevent the infected coming over and polluting the Ugandan communities during fishing trips.

A participant from Bukwekwe men's group suggested that drugs should be left with the drug distributors so that people can get the drugs from him at any time when they feel they are infected.

Health education
Several of the men's groups reported hearing information and education messages about schistosomiasis through the drug distributors and local leaders and very rarely on the radio (KFM and Eastern Voice). The group participants reported that their preferred methods of hearing information messages would be through the radio, newspapers and posters (men) and through the government training volunteers and health workers (women). Women in both intervention and control arms additionally identified drama as a preferred means of communication as many people, especially women, don't have radios. These responses did not change between baseline and follow-up discussions.

Areas that the participants required more knowledge on were how schistosomiasis infects, how it is spread and how long it takes to cure after treatment. One respondent at Sirere men's group reported he would like to see the schistosomiasis worm and others agreed. Many of the women participants wanted to know how they could protect themselves and their families from infection.

Control groups
Bukwekwe women all reported they had never been taught or heard any information other than from family and neighbours, about schistosomiasis at baseline, however, at follow-up they reported having attended a gathering in Lunyo town that was providing information about schistosomiasis.

A participant in Manjanji men's FGD reported *'I was asking the Ministry to send the same books which have the pictures representing how schistosomiasis is caused, spread and prevented, so that we teach our children by using that story book'.* (Male FGD, Manjanji).

Discussion

The Acting Against Worms project's goal was to encourage behavioural change for schistosomiasis control through engaging school children and teachers in developing their own drama productions. To the authors' knowledge this is the first project to introduce drama techniques as a means of communicating health messages about schistosomiasis and effecting behaviour change, however learning through drama has been successfully used in other health fields notably HIV/AIDS prevention (Harvey *et al.,* 2000; Mabala and Allen, 2002; Middelkoop *et al.,* 2006). The evaluation of this project was by using a cluster randomised trial, a methodologically rigorous approach evaluating community level interventions (Habicht *et al.,* 1999; Hayes *et al.,* 2000; Victora *et al.,* 2004), to measure if changes in knowledge attitudes and practices were seen between those schools receiving the drama activities, the intervention, and those in schools receiving the standard health education, the control, following the drama development and festival.

Overall the KAP survey revealed that there was little difference between the intervention and control arms at follow-up where an increased change would be expected in the intervention arm. However, a significant increase was seen in the proportion of students who heard about schistosomiasis through their teachers and an impact on knowledge of how one becomes infected with schistosomiasis were both seen in the intervention group at follow-up. Additionally, although there was no difference between the two arms at follow-up there was a significant increase in the correct answers given at follow-up than at baseline for how schistosomiasis is transmitted from person to person. These differences are interpreted as being a result of the drama intervention; similar impacts have been seen in elsewhere in Uganda for HIV/AIDS education (Mitchell *et al.,* 2001) Tanzania (Kamo *et al.,* 2008) and Kenya (Onyango-Ouma *et al.,* 2005).

The statistical differences between proportions of pupils' responses in the intervention and control arms at baseline could be explained as a result of chance due to the randomisation procedure. However, the intervention group frequently had higher proportions than the baseline group and this may be explained by unknown confounding factors.

We found that our preconceptions relating to the pupil's level of understanding of schistosomiasis and its prevention were actually quite different to the reality. Early on in the project it became apparent that the general knowledge of prevention and treatment was very high. This has been corroborated with the baseline KAP evaluation. However, there were a number of social, economic and behavioural issues, which prevented this knowledge being translated into practice. The focus of the project then shifted from educating about the disease to messages about how to actively change behaviour. Ultimately, this behaviour change can only be measured over a longer period of time than was available under this grant. Additionally, some measures of behaviour change may be too sensitive for pupil's to feel comfortable sharing with a research team, for example, visiting the lake for toilet purposes or defecating in the water whilst at the lake for another purpose.

There were few differences identified between the intervention and control groups participating in the FGDs at follow-up with the participants having similar perceptions about schistosomiasis, its control and prevention. These perceptions are also in agreement with other qualitative studies carried out in Uganda (Parker *et al.,* 2008; Fleming *et al.*, 2009). Most notable from these discussions, was the perception that without the provision of increased and functional safe water sources and the building of latrines in family compounds it will be difficult for many to change their relationship with and use of the lake water and thus communities will remain at-risk of infection. To improve on current control strategies recommendations were made for the treatment drugs to either be more available from drug distributors or at health centres and the hospital or for the mass treatment to be given more frequently to cover those who have missed one round. Although praziquantel, the treatment drug, is inexpensive, the former proposal of free drugs being available at health centres following the mass treatment campaigns, is the most pragmatic solution to avoid unnecessary treatments and one in which the MoH with support from SCI are planning to implement in Uganda.

At baseline, health education through the medium of drama was only mentioned by the women's groups in both study arms with men only suggesting the method at follow-up. This may have been a result of subsequent discussions in the communities provoked by the actual study itself or by the reaching effect of the drama festival that was held at Bwanikha primary school in Lunyo sub-county. Drama is seen by communities and especially women, as a powerful tool of communication because of its entertainment value and because there are no boundaries or limits to those who can receive it. Unlike radio and newspaper announcements which require resources that many rural Ugandan families do not have and the women in a household do not have at their disposal.

Study Limitations

In reporting the findings of this evaluation it is important to take into account potential limitations of the study. Included is the large loss to follow-up seen in KAP study between baseline and follow-up this is due to nature of the transient fishing communities that are found on the lakeshore of Lake Victoria. This substantial loss of pupils followed up from baseline may have had an effect on the results described through the analysis as the sample size was smaller at follow-up than what was calculated as required to measure a change in. If this study were to be repeated the investigators would ensure that the full sample size was present for follow-up rather than at baseline. Furthermore, the baseline knowledge of the pupils was higher than expected and thus it would be harder to achieve the expected impact of 10 to 15% change in KAP between the two study arms. Finally the measures chosen to identify changes in practice were not sensitive enough or it may be that changes in behaviour manifest themselves at a future time point rather than during the study period.

Conclusions

The evaluation results do show some supporting evidence that the Acting Against Worms project had an impact on the knowledge attitudes and practices in the school-children where the drama was rolled out. By those directly involved in the drama project it was acknowledged that the initiative benefited not only themselves but their wider community by engaging the pupils and teachers in researching the biomedical and local understandings of the schistosomiasis infections for developing

their plays and involving a community audience. The youth are important 'agents of change' and by involving them in such educational projects it not only empowers them but increases their life skills for the future. In addition, drama is perceived as an effective communication and education tool in rural communities and thus should be used by schools and communities to spread messages about schistosomiasis prevention and treatment in endemic communities. The representatives of the MoH that were involved agreed that the project had a far reaching and sustainable impact on those involved, and should be incorporated into existing control strategies to strengthen the current health education practices.

Although, fundamentally, it would be valuable to have all school-children and communities understanding the correct modes of transmission and prevention of schistosomiasis for example, that drinking unboiled water is not a risk and that blood in urine is not a sign of infection; it is more crucial that communities link unhygienic practices in water bodies and contact with contaminated water through bathing, swimming and collecting water and the importance of using pit latrines i.e. behaviour change, with contracting schistosomiasis infection. We are now at the point in schistosomiasis control, in Uganda and in other African settings, where the focus needs to be on integrating mass chemotherapy with improving safe water and sanitation facilities that will support and encourage the corresponding behaviour change essential to ensure schistosomiasis is no longer a public health problem.

Future Work

The dissemination of these findings in the intervention and control areas will be carried out by the school-children and Masafu drama group with the support of the District Vector Control Officer and the team that have been involved at the MoH. In addition to the reporting of the results, discussions on what was achieved and what limitations were faced by implementing the drama will be held with the schools and communities. Further to this monitoring and evaluation of schistosomiasis infection will continue to take place as part of routine MoH and SCI programme activity in Busia district and further developments on how to improve behaviour change towards preventing infection and access to free treatment will be carried out in the region.

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ACTING AGAINST WORMS

A joint health education initiative between Uganda and the UK to control worms and associated disease through the medium of drama

Teacher's Briefing Pack

This briefing pack provides an outline of the Acting Against Worms (AAW) project. It is intended to serve as a resource and reference material to back–up the project's practical activities and your own knowledge and understanding of worms and associated diseases.

Basic information about both Bilharzia and intestinal worms is provided alongside an overview of how you and your pupils might like to produce a play based on the theme of changing behaviour to minimise disease.

AAW - the Organisation and its Aims

This drama-based initiative aims to work with schools and communities in Busia to help improve understanding and public engagement with health messages related to preventing and controlling Bilharzia and intestinal worms.

AAW is a collaboration between the Schistosomiasis Control Initiative (SCI) from Imperial College London, UK, the Ugandan Ministry of Health and *Theatrescience* also based in the UK. It is funded by the UK-based medical charity, the Wellcome Trust and the SCI.

AAW looks forward to working with teachers, pupils and communities in Busia, Uganda.

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Fiona Fleming
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Dr Narcis Kabatereine

Drama practitioners:
Rebecca Gould
Jeff Teare

THE DRAMA OF DISEASE

This project aims to actively involve school children with drama and performance to encourage understanding of how disease is spread and how each individual can take responsibility for controlling Bilharzia and intestinal worms through changing their everyday behaviour

This briefing pack consists of two main sections:

THE DISEASES. *It's up to us: how we can minimise disease and the spread of Bilharzia and intestinal worms*

PUTTING ON A PLAY. *Healthcare through drama: The aims, process and outcomes of producing a play on the theme of worms and disease*

THE DISEASES *It's up to us: how we can minimise disease and the spread of Bilharzia and intestinal worms*

In this section you will learn about:

1) Symptoms of disease and causes of Bilharzia (schistosomiasis) and intestinal (hookworm) worms

2) Reasons why it is important to control Bilharzia and intestinal worms

3) How Bilharzia and intestinal worms cause disease

4) How Bilharzia and intestinal worms can be prevented and controlled through changing behaviour and use of drug treatment

1) Symptoms of disease and causes of Bilharzia and intestinal worms

Bilharzia

This is a disease caused by Bilharzia worms found in the freshwater lakes, ponds and streams and some snails which live in the water. The Bilharzia worms also live within the human body where they can cause disease.

Within the human body, eggs from the adult worms get trapped in the body and cause damage around the intestine, liver and other parts of the body. The scientific name for the worm is *Schistosoma mansoni*. Eggs produced by the worm accumulate in the wall of the intestine and the liver causing damage and illness. It may take many months or years for symptoms to become obvious. In reaction to the eggs, the body becomes inflammed and tissues and body organs may become scarred. This may cause abdominal cramps pain and/or bloody stools or diarrhoea. Due to repeated infection, from using water infected with the worms everyday, children can develop anaemia and malnutrition. Absence from school and the fatigue which goes with the disease can lead to poor school performance and learning difficulties.

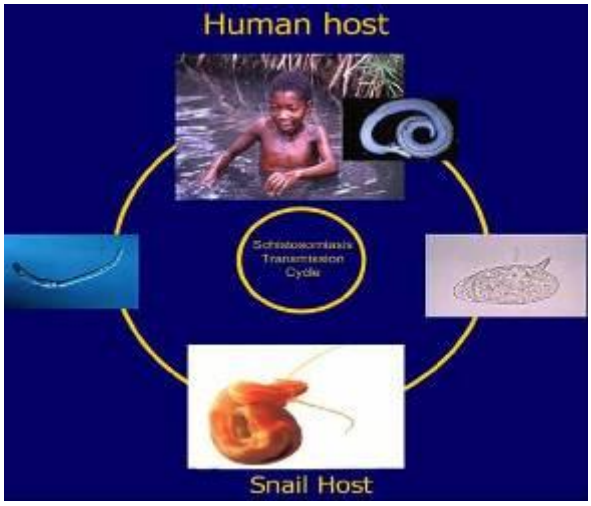

Figure 1. This life cycle diagram of bilharzia shows pictures of the worm at different stages and the egg which normally need to be seen under a microscope and cannot be seen swimming in freshwater.

If untreated, the damage caused by the Bilharzia worm eggs can increase, and the eggs can sometimes travel elsewhere in the body and cause:

- Breathlessness
- Cough
- Chest pain
- Painful and swollen stomach
- Liver failure
- Seizures
- In the worst cases, bilharzia can kill the victim (it can be fatal)

Uganda schoolchildren suffering from Bilharzia

During Child Health Days, children receive praziquantel, tablets which help clear the bilharzia worms from the body.

Intestinal worms - Hookworm

Hookworm is a type of parasite of the group known as the soil-transmitted helminths (STHs) or intestinal worms. Hookworm is the most common type of intestinal worm in Uganda.

Without treatment, hookworms cause internal blood loss leading to anemia and malnutrition, particularly in children and pregnant women.

If infection with hookworms persists for a long time without treatment then infected children may suffer from physical problems and learning difficulties at school.

During Child Health Days, children receive albendazole, a tablet which helps clear hookworms from the body. They receive albendazole in addition to the tablet of praziquantel which treats bilharzia worms.

2) Reasons why it is important to control Bilharzia and intestinal worms

- schoolchildren especially could suffer from serious illness

- Bilharzia can cause loss of blood, malnutrition, poor attendance at school, tiredness, and more serious long term consequences such as liver problems, cancer or even death in the worst case

- children may not attend school because they are too ill and miss out on their education. Without an education, it may be more difficult to find a good job and look after their own families when they grow up

- both Bilharzia and intestinal worm infections can leave children weak and more susceptible to other illnesses

3) How Bilharzia worms and intestinal worms cause disease

The following text explains the lifecycle of the **Bilharzia** larvae and worms, courtesy of information provided by the Wellcome Trust:

- people come into contact with Bilharzia worms through everyday activities such as swimming, fishing and washing clothes

- Bilharzia worms enter the body through the skin and take about 3 days to reach the blood capillaries under the skin

- over the next 7 days the Bilharzia worms migrate through the blood system from skin to lungs, heart and liver

- once in the liver, they mature to adult worms and then form male/female pairs for mating. This takes about 45 days. The pairs then migrate to their final resting site.

- the average lifespan of the Bilharzia worm inside the human body is 5 years but this can last up to 20 years.

- the eggs released from the Bilharzia worms in the human intestine penetrate the walls and are excreted in the faeces.

- about half the eggs actually become trapped in the body and cause damage to the intestine, liver and other organs.

- once the eggs which have been released in the faeces reach freshwater, they hatch to produce larvae which then search for a suitable snail host to infect

- these larvae enter the snail and then multiply and develop in the animal

- the larvae live in the snail for 4-6 weeks

- one snail can release up to 3000 mature larvae per day into freshwater

-the mature larvae remain alive in the water for up to 48 hours

- the mature larvae may enter through the skin of somebody in the water (washing or playing) to continue the cycle

Hookworm larvae are passed on to humans through skin contact with contaminated soil, usually due to walking barefoot.

Once inside the body, larvae are carried through the bloodstream to the lungs and mouth. Here, they are swallowed, digested and passed to the small intestine. Within the intestine, the larvae mature into half-inch-long worms which attach themselves to the intestinal wall where they feed on human blood.

Adult worms mate and hatch thousands of eggs, which are passed into the faeces produced by the human. If the faeces come into contact with soil under the right conditions, the eggs hatch into larvae.

If these larvae are passed on to other humans, the cycle begins again.

4) How Bilharzia and intestinal worms can be prevented and controlled through changing behaviour and use of drug treatment

Bilharzia

The Ugandan Ministry of Health provides drug treatment for Bilharzia with praziquantel during Uganda's Child Health Days in April. All children should attend the days and receive the drug which kills any Bilharzia worms in their bodies. This does not prevent people from picking up more Bilharzia worms but it does keep the numbers of Bilharzia worms low enough to reduce illness.

However, drug treatment alone is not enough to control the disease. People need to change their behaviour in order to prevent becoming infected with the bilharzia worms. Children, in particular, who play in lakes and ponds need to make small changes in their behaviour which can reduce their chance of getting infected with the bilharzia worms.

Here are some examples of ways of changing behaviour to minimise transmission of Bilharzia worms:

- Avoid swimming, fishing, washing or wading in freshwater such as in Lake Victoria
- Bathe in safe water. Use water from boreholes or 'safe-water' sources as opposed to water from lakes, streams, and ponds.
- Avoid defecating in lakes, streams and ponds to prevent contamination with sewage. Use a latrine if not too far away or gather support to have a latrine built.
- If working, fishing, washing or doing any other activity near the lake edge or on the lake then try to avoid putting your feet in the water or wear shoes. The worms live freely in the water and can infect through your skin if it makes contact with the water.
- Tell as many of your friends and family as possible about the risks involved in paddling in the water.

- Try and use clean water from a well or running water to wash clothes if there is a source near you.
- Make sure you attend the annual Child Health Day in April
- Continue to attend the Child Health Day annually even if you think you (or others in your community) do not have Bilharzia or intestinal worms. The worms may still be present in low numbers and without annual treatment, worm numbers will rise and disease will return.

A schoolchild receiving treatment

A healthy child attending school

Intestinal worms

Albendazole, a drug used to treat intestinal worms is also provided to school children by the Ugandan Ministry of Health at the Child Health Days. This drug kills the worms but, in a similar way to Bilharzia, complete control requires behavioural change too.

Here are some ways to minimise transmission of intestinal worms:

- It is important to use latrines where possible to prevent passing intestinal worms into the soil from where they can find a new human host
- Wearing shoes prevents intestinal worms in the soil making contact with bare feet and entering the human body
- Attending Ugandan Child Health Days to receive treatment with albendazole every year is very important to kill and control intestinal worms

CLASS DISCUSSION

You may wish to have an interactive discussion with your class. Here are some suggested questions to start. Perhaps somebody in the class could take notes of responses to these questions to help provide material for the play.

- What do you know about Bilharzia worms or intestinal worms?
- Why are they harmful?
- Do you remember in which animals the Bilharzia worms live?
- Where do intestinal worms live?
- Do you know anybody in your school or village who has been very sick from worms?
  - Who?
  - What happened to them?
  - What symptoms did they get?
  - Did they miss school?
- How often do you go in lakes, ponds etc.?
- Do you walk around with bare feet?
- What are the main reasons you go into lakes or ponds?
- Do you eat food fruit or vegetables that have not been washed in clean water?
- What daily activities do you do that could encourage infection with Bilharzia or intestinal worms?
- How could you change your daily activities to prevent either Bilharzia or intestinal worms?
- Why should you take treatment for Bilharzia and intestinal worms even if you don’t feel sick?

PUTTING ON A PLAY

The practical drama element of this project is being run by Rebecca Gould and Jeff Teare of Theatrescience – www.theatrescience.org.uk

Background

Theatrescience uses drama to explore and express biomedical science issues: practical, moral, ethical, political and economic. We aim to deepen the understanding of the impact of science on society and to heighten awareness of scientific issues. As with ACTING AGAINST WORMS, we often have a public health remit, and work with schools and young people to inform, educate and inspire performance.

Main Aims

1. To educate school pupils and their teachers about Bilharzia and intestinal worms and to explore if our particular method is effective.

2. To actively engage school pupils and their teachers in discussions around the prevention/control of Bilharzia and intestinal worms

3. To enable teachers and school pupils to create dramatic presentations about Bilharzia and intestinal worms and their prevention/control.

4. To enquire whether creating a performance is a good way to engage pupils in prevention, and furthermore to explore if through 'giving them a public voice', a greater ownership of preventative methods exists, following the project.

5. To enquire whether performance is a good way of sharing knowledge with other pupils and those in their communities.

6. To present these pieces collectively at a drama festival, to take place in March/April 2010; and to raise the profile of Bilharzia and and intestinal worms prevention methods and of the research that is currently taking place into the disease in the Busia region of Uganda.

7. To use these presentations to engage and educate all audiences about Bilharzia and intestinal worms and their prevention/control.

Process

1. Inset Session with Teachers – Oct 2009

An introductory whole day training session will be held for all participating teachers and community artists. This will happen at a central location. At this session both the biology of Bilharzia and intestinal worms and, the potential dramatic expression of preventive measures against the disease will be explored. This session will be led by Rebecca Gould and Jeff Teare with Becky McCall and Fiona Fleming. The Theatrescience team will lead practical drama exercises based on work carried out by them in the UK and India over the last seven years. 'Applied Drama' techniques and example models of work will be introduced. Becky and Fiona will brief the teachers about the disease and answer any biomedical and/or scientific questions.

Note: 'Appled Drama' is the use of drama and theatre not just for entertainment but for information and public engagement, in this case with public health issues.

2. School Workshops - Oct 2009

An initial workshop will then be lead by Rebecca and Jeff with the teachers and pupils in each participating school (2 hours). These workshops will again introduce and explore drama techniques which can be used to explore and express biological information and public health messages. Particular emphasis will be given to physical/movement work and the use of music and mask. A devising process wil be undertaken on a biomedical subject other than Bilharzia and hookworm.

Workshop Plan:

1. Physical/Vocal Drama Warm Up/Games – 20 mins.
2. Introduction of Applied Drama Techniques – 30 mins.

3. Biological Science Input – 10 mins.
4. Devising Exercise in Groups - 30 mins.
5. Sharing of Devised Work – 15 mins.
6. Outline of 'Acting Against Worms' Project – 5 mins.
7. Q&A – 10 mins.

School pupils and teachers may then go on to discuss their own process to devise or write their own scripts, or to tell their story in a different way; for example using only dance, masks and music.

3. Teacher/Research/Drama Pack

A pack of information, techniques and project development/structure suggestions will then be provided to each school covering such issues as:

Further research possibilities:

1. Devising/Writing Strategies
2. Drama exercises and techniques
3. Possible models of work
4. Resource Information

4. Presentation Development Nov 2009 – Feb 2010

Each school will then devise/create and reherse their own performance piece about Bilharzia and intestinal worms, their prevention and the importance of taking the annual treatment provided by the Ministry of Health. This activity will be provided with long-distance support by Theatrescience.

5. 'Show-Doctoring' – Feb/March 2010

Immediately prior to the Drama Festival presentation of these performance pieces, Rebecca and Jeff will re-visit each school to advise/'show-doctor' as necessary. Any technical/production matters can also be addressed.

6. Drama Festival – Feb/March 2010

All the school's dramatic pieces will then be presented at a Drama Festival held at a central location. Rebecca and Jeff will 'stage-manage' and compere/present as required.

7. Community Performances

The pieces will then be performed individually to local schools and community audiences.

8. Video

All pieces will be videoed. This will be made available on disk and on-line.

Outcomes:

1. Approximately eight pieces of performed drama on Bilharzia, intestinal worms and their prevention and control.

2. The engagement and education of participation pupils and teachers.

3. Festival presentations of all pieces.

4. Further presentation of all pieces in schools and to community groups.

5. The engagement and education of audience members at all presentation.

6. Video material for further promulgation of the work.

7. A report and evaluation of the project as a basis for further development.

FURTHER INFORMATION

Evaluation:

Teachers, Community Based Organisations (CBOs), pupils and other members of the community may be asked to participate in focus group discussions or to complete other questionnaires. These are designed to help us make the project relevant to your needs and those of the local community, and to understand how the project has been received by those involved.

If you have any thoughts on how you and your school can contribute this evaluation, then we would be very pleased to discuss this with you.

Biographies:

Fiona Fleming is a country programme manager with SCI and has assisted the Ministries of Health in both Uganda and Zambia since 2005 with their national schistosomiasis and intestinal worm control programmes and more recently gives technical assistance to the Uganda Ministry of Health's NTD Control Programme. A large element of her work is in conducting research to ensure programme impact and performance. The research component covers a broad range of indicators from parasitological and clinical parameters, to process evaluation and economic evaluation. Fiona works with stakeholders at the national and district level but also with schools and communities. In recent months she has been carrying out a study to evaluate the NTD programme in Uganda.

Before her role at SCI, Fiona studied for a Masters in the Control of Infectious Diseases at the London School of Hygiene and Tropical Medicine. Prior to these studies Fiona lived and worked in Uganda for 4 years and was involved in rural school health education and community health and agriculture projects in the east of Uganda (Mbale, Sironko, Jinja and Kamuli districts).

Dr Narcis Kabatereine is the Head of Vector Control Division (VCD) of Ministry of Health Uganda, where he has been since 1980. VCD is a Community Health Department of Ministry of Health. The Division offers specialist services in the control of Vector Borne Diseases such as trypanosomiasis, onchocerciasis, schistosomiasis, malaria, lymphatic

filariasis, and intestinal worms. VCD also trains Vector Control Officers for award of Ministry of Education diploma certificate in Medical Entomology and Parasitology and Dr Kabatereine, who is also a trained graduate teacher, headed the school from 1983 to 1987. He is a holder of a PhD degree in Epidemiology of Schistosomiasis which he obtained in Copenhagen University, Denmark in 2002.

Other than heading the VCD, Dr Kabatereine is also the National Manager of the Bilharzia and Worm Control Programme. Together with several collaborators within Uganda and internationally, he has carried out extensive work in the field of schistosomiasis and worm research and control. Dr Kabatereine has been working as a part time consultant for WHO for over 7 years which has given him immense experience as he travels globally but particularly in sub-Saharan Africa.

Becky McCall is a science and medical journalist with a Masters in Science Communication from Imperial College. She has written a book about the SCI. Part of the book research was conducted in and around schools and communities in Uganda, where she worked with Fiona Fleming and met Dr Kabatereine. It was during her research and writing of the book that Becky discovered the importance of health education both as a stand alone mechanism to control to disease and as support to treatment programmes. She has also written for the Medical Research Council on medical research in sub-Saharan Africa (The Gambia and Uganda), and complied interactive CDs on tropical diseases for the Wellcome Trust.

Rebecca Gould has, in addition to ongoing work with Theatrescience, recently co-written a book on working with Shakespeare and young people, for Methuen, and directed the Regional Schools Celebration in The Courtyard Theatre for the Royal Shakespeare Company. She has also worked extensively as a director and producer for the National Theatre's education department.

As Associate Director for Made in Wales, and later the Theatre Royal Plymouth, she directed many new plays and began an ongoing collaboration with a Ghanaian Theatre, African Footprint.

Rebecca co-founded Tinderbox with Jeff Teare in 2002 to concentrate on developing new work. Through the ongoing Theatrescience project, she has

produced work with schools, communities, scientists and artists across the UK and in India.

Jeff Teare has over 35 years of major theatre credits to his name, ranging from Associate Directorships with The Young Vic and the Theatre Royal Stratford East in London through to a wide variety of productions from Penzance to Newcastle in the UK. Jeff has been involved with over 150 school science/drama projects and many workshops, readings and professional productions with the specialist consultancy Tinderbox (which he co-founded with Rebecca Gould in 2002) and Theatrescience. He's widely acknowledged as a pioneer in using education and theatre to challenge and dismantle the arts/science divide.

AAW – Contact Information

Members of the AAW Team can be contacted either through the

Busia District Vector Control Officer:

Mr Robert Mulimbwa phone no. 0772 619363 and 0702 920019

Or directly through email to:

Jeff Teare mail@theatrescience.com

Fiona Fleming f.fleming@imperial.ac.uk

ACTING AGAINST WORMS

A joint health education initiative between Uganda and the UK to control worms and associated disease through the medium of drama

Teacher's Workshop Pack

This teacher's pack for the AAW project supports the workshops led by the Theatrescience team. It is a resource which you can refer to throughout the process of helping your pupils to create and perform a drama piece around the theme of changing behaviour to minimise disease.

You should already have received a **Teacher's Briefing Pack**, which contains reference material to support the project's practical activities and to reinforce your own knowledge and understanding of worms and associated diseases.

The Briefing Pack contains basic information about both Bilharzia and intestinal worms (hookworm), along with an overview and timetable of the AAW project.

This **Teacher's Workshop Pack** consists of guidelines on planning and running your project, together with a list of drama exercises that you can use with your pupils and explanations to guide you through the exercises. We hope that you find it useful, and that you enjoy planning and performing your piece.

Contents

INTRODUCTORY NOTES

Objective

The main aim of this project is for each school to create a 10-minute piece of drama concerned with the nature, effects, prevention and treatment of Bilharzia and intestinal worms (hookworm), which will spread positive health messages about the prevention and treatment of worms.

Project Process

All teachers and community artists will attend a training day, where they will learn some techniques for creating performance, as well as some facts and figures about the Bilharzia and intestinal worms (hookworm).

The AAW project team will then lead an initial Science/Drama workshop for teachers and pupils in each participating school. The main purpose of this will be to introduce the idea that drama can be used to increase awareness of science and health issues. The team will work together with teachers and pupils to think about how the chosen subject can be researched, and how it can be represented in a drama performance.

The training day and workshop will teach you performance techniques and guide you through the exercises outlined in this pack, as well as providing relevant scientific information.

After the workshops, the two Teacher's Packs will help you to plan and run your own projects. You can also contact the Theatrescience team by email <mail@theatrescience.com> if you have any questions or problems.

Principles

The process outlined in this pack is based on a model of work developed by *Theatrescience* in the UK and India over the last seven years, which focuses on being both practical and engaging.

It is based on the following principles:

Creativity
Collaboration
Inquisitiveness
Engagement
Inclusivity
Responsibility
Mutual respect

Each performance should both *entertain* and *inform*. It should incorporate pupils' and teachers' ideas for how children, communities and schools can help to prevent the spread of Bilharzia and intestinal worms (hookworm). The use of music, movement, dance, masks, puppets etc. is encouraged.

Teachers

To ensure that the scientific and biological information in your play is accurate, you will need to be familiar with what your students know and how they are taught science. For this reason, it is ideal to have a science teacher involved in this part of the process. If this is not possible, the teacher in charge will need to know what is taught on the school's science curriculum. There are further notes on this in the Teacher's Briefing Pack.

Back-up help and guidance on research will be provided during the devising/writing/rehearsal process by the AAW Team.

If possible, we suggest that at least one science and one language/ drama teacher work together on the project. In some schools in the UK and India, there have been more teachers involved: up to two drama and three science teachers, as well as teachers of music and English. If no

specialist teachers are available, it is preferable for a teacher with some previous experience of performance to lead the project.

Students

This project is mainly aimed at students aged between 12 and 16.
Younger children can be involved, but they will need more guidance and instruction.

Group sizes will vary between schools, but drama generally tends to work best in groups of 10 to 20 students. If more students want to be involved, it is best to split them into smaller groups and perhaps give each group a distinct task (music, dance, acting, technical support, etc.)

Planning Your Time

The time needed for this project depends on how much it is integrated into normal school work. Some schools choose to rehearse entirely after school, others will rehearse entirely during school hours; most will use a mixture of lesson times, lunchtimes, and after-school sessions. It is up to individual teachers and schools to decide what will work best for them.

Based on our experience, we think a minimum of 15-20 hours is needed to devise and rehearse a 10-minute show. This varies depending on students' ability, the subject matter, and the audience expectations.

EXERCISES

This section contains a number of drama exercises which we have used successfully in the past when devising and producing new pieces of drama around scientific themes. Each exercise contains step-by-step instructions to guide you as you lead your students through them. We will also take you through these exercises in the workshops so that you understand fully how they work in practice.

Warm Up Exercises

Handshakes

- Participants stand in a circle
- The leader demonstrates how the exercise works: "Hello, My name is…" Right and Left hand shake
- Your intention is: To meet everyone in the room
- Your obstacle is: You only have 1 minute to do it and you must observe the left hand right hand rule
- Repeat exercise, but this time you must meet/shake the hand of everyone that you haven't yet

Paired talking

- Find a partner (3-second countdown)
- Choose roles: A and B
- 'A' begins, and has 1 minute to tell their partner their name and about their experience of first day of teaching
- 'A' and 'B' then swap roles and repeat the exercise. This time, 'B' must tell 'A' about their first experience of theatre, performance, or dance

Starting image work

- Ask participants to lie on the floor and listen for the leader to say 'go'
- They must then visit all four corners of the room, in any order, as fast as they can
- Then return to the centre, make the weirdest, most exaggerated shape they can think of, and then FREEZE
- Ask participants to copy the shape of any person they can see
- Repeat the copying exercise several times, each time exaggerating the space they take up

"Make me a…" (Paired images)

- Students work in pairs.

- Ask each pair to make instant images of: *A pop star, a car, a teacher, a government official, a policeman, a parent, a frightened child, the love of your life, your worst enemy*
- Then ask them to make pictures of:
- *An artist, A scientist*

Discuss: What are the differences between these two pictures? Can you tell what kind of attitudes the participants have towards artists and scientists? Are there stereotypes or generalisations which you can identify?

Note: This exercise gives you, as the teacher, an opportunity to reflect on how it focuses the participants' attention on the use of art (or drama) to address science (the biology of bilharzia and hookworm).

Bomb and Shield

- Participants walk through the workshop space
- Ask them to become aware of the environment and of each other, finding and claiming space as their own
- On an instruction from you, they must secretly identify someone who is a"bomb". They must keep as far away from this person as possible.
- Next, on your instruction, they identify a "shield". They must keep the shield between themselves and the bomb.

Discuss: How might this game demonstrate scientific principles of mass and energy? For example, the movement in the group changes when the 'bomb' is introduced, rather like molecules of a liquid being heated. The movement generally results in 'clumping' when the shield is introduced, something like separation under heat, the formation of plastics etc.

Physical Characterisation

Aim: to create a physical character by using kinaesthetic body awareness (listening through their bodies).

- Participants move around the space. This time, ask them to concentrate on their speed, energy, and rhythm
- Ask them to "lead with" a part of their body e.g. nose, foot, chin, knee, etc.
- Ask them: What pictures does this spark in your mind? What sort of person would "lead with their chin"?
- Ask participants to think about a particular injury they have had in their lives. Which part of their body was injured? How do they

relate to it now? Does it affect the way they move? Do they try to protect it, compensate for it, etc.?

Discuss: If you were to create a new character, where would they "live in their body"? Which part of their body would they lead with? How would they move? What does the way we walk, sit, stand, etc. tell others about our personality or personal history?

Geography Game

- Participants walk around the space until you tell them to FREEZE, when they hold their position
- On your instruction, they move from this position, and then on a second command from you, return to exactly the same position (both in terms of where they are in the space, and their body shape)
- Repeat the exercise 3, 4, or 5 times, each time creating more complex body shapes

Discuss: What senses and stimuli were you using in the game? How did you remember the position you had been in? How might this game demonstrate principles of memory and physical memory?

Double Helix

Show participants a picture of the DNA double helix, and explain what it is.

Discuss: In what ways can we use our bodies to create a physical representation of the basic DNA structure? Is there a way of interpreting the DNA structure so that we can create a picture which is our own personal representation of it? What is the difference between true representation and interpretation?

Giant Body

Ask participants to work together to collectively create an image of a giant body. Start with the obvious organs (heart, lungs, brain, etc.), then move on to the circulatory and other systems.

Discuss: Is this a good way of verifying or strengthening basic biological knowledge? What might happen if the system failed? How could we represent this?

Main Activities

Greek Chorus
Aim: to move in unison like a flock of birds.

- Participants stand in a triangle or V-formation.
- The leader of the triangle (at the point of the V) moves around the space, performing whatever actions they wish.
- The other students copy their actions, moving in unison.
- Every time the flock changes direction, a new leader takes over and leads the flock.

Group Statements
Divide students into 5 groups.

Each group represents one of the following statements:

- Avoid swimming, fishing, wading, or washing in freshwater such as in Lake Victoria

- Bathe in safe water. Use water from boreholes or 'safe-water' sources as opposed to water from lakes, streams, and ponds.

- If working, fishing, washing or doing any other activity near the lake edge or on the lake then try to avoid putting your feet in the water or wear shoes. The worms live freely in the water and can infect through your skin if it makes contact with the water.

- Tell as many of your friends and family as possible about the risks involved in paddling in the water.

- Try and use clean water from a well or running water to wash clothes if there is a source near you.

Ask each group to work out a way of representing their statement physically. They must move together in unison (as in the previous exercise) but they should choose a quality of movement and formation that clearly presents their statement.

When they have perfected their movement sequence, ask them to write a short piece of text which emphasises their movement, and then to find a way of saying the text collectively, or adding sounds to their actions.

They rehearse and each group then presents their work to the rest of the class. Ask for feedback: What works well? What needs refining?

Choreographing simple sequences

Participants work in small groups.

Ask each group to discuss why some people ignore the advice on preventing bilharzia and hookworm.

Each group lists 10 reasons for this on a piece of paper. For example: "people are too busy", "people are too proud", "people don't believe the illness exists", etc.

They then suggest an action to represent each reason, and list the 10 actions on a large sheet of paper, numbered 1-10. For example, "rushing", "turning your head away", "putting your fingers in your ears", etc.

Then ask each participant to write out their date of birth, for example 23/04/1990.

Using the moves listed on the sheet of paper, students create a sequence of moves from the eight numbers in their birthday.
For example, the date of birth 23/04/1990 gives the movement sequence 2, 3, 10, 4, 1, 9, 9, 10.

When they have their own sequence of eight moves, they share these in their small groups. Ask each group to choose the most interesting parts from each of their sequences, and then put these sequences together to create a communal movement piece.

When creating their piece, they have the following options:

- All perform the same movement, at the same tempo
- All perform the same movement, but at different tempos
- All perform different movements, at different tempos

Ask them to choreograph a piece that uses between three and five of these movement sequences. When they have rehearsed their piece, they then perform it to the rest of the group.

Ask everyone to look at how the groups are using the available space. Are they all squashed together as a group? Are they spread out across the stage? Do they travel in space or remain on the spot? Which of these is the most effective?

Finally, ask each group to choose key words, phrases or sounds to add chorally to the sequence.

Discuss: How does working practically and quickly help to build a performance energy? What difficulties did the class experience when doing these exercises?

CREATING YOUR PERFORMANCE PIECE

This section of the pack will guide you through the process of helping your students to devise, create, and perform their 10-minute piece of drama.

Initial Discussions

As a starting point, discuss some of the following questions with your students. We have suggested some exercises, outlined above, which you can use to inspire your students in thinking about their piece.

Questions:

How do the symptoms of Bilharzia and hookworm show themselves?

Suggestion: Use the **Physical Characterisation** exercise to encourage students to experience how it feels to suffer from the disease.

What are the social effects of the illnesses? Do they prevent people from working? If so, how does this affect their family and their community? If you saw someone with symptoms of Bilharzia or hookworm, how could you approach them and offer health advice?

Suggestion: Use the **Greek Chorus** exercise to represent those who are trying to offer help, and those who are refusing help.

How could we represent the progression of the diseases?

Suggestion: Use the **Giant Body** exercise to show how the changes that take place in the body.

How might the diseases specifically affect young people's educational opportunities? What does this mean for their future?

How can infection be avoided? Suggestion: Use the **Group Statements** exercise.

How can you know what is 'safe' water? How can we help not to contaminate others? What simple advice/instructions will help?

How can treatment be administered?

Audiences

It is important to think about who your audience will be for the final performance(s), even at this early stage. Encourage your students to think about who the play is *for*. Who are the audience likely to be? How can they be addressed? What will work well for this audience?

Starting to Create Your Piece

To introduce students to performing, we suggest beginning with the following exercise. To prepare for this exercise, write each of the following 'scene titles' on a piece of paper:

- How people get infected.
- Symptoms of each disease.
- Effects of each of the diseases.
- Treatment of the diseases.
- How to prevent getting infected.

Divide students into small groups. Give each group a piece of paper with a 'scene title' on it, and ask them to make a still picture representing that title.

When they have done this, ask them to show their pictures back to the rest of the group. Then ask them to swap their pieces of paper with another group.

This time, they make an image of the scene title, and also a second image representing its opposite. So for example, if they have the scene title "how people get infected", they also create a second image showing "how not to get infected". If they have symptoms of the disease, they could also make a picture of someone being well and healthy etc.

Each group then performs their two images for the rest of the group. The images must flow seamlessly into one another.

Good performance works by showing the audience both sides of the argument; the more you can demonstrate the opposites that exist within you story the better.

Nominate someone in the audience as "the joker". The joker becomes the director of the whole group. When the joker claps their hands, the group must animate their image for 5 seconds, and then return to their frozen state.

The joker then places their hand on the shoulder of one of the performers and they must speak directly to the audience in the first person, telling them what they are thinking. For example: "I'm scared", or "I wish I could go back and change what I did", or "I don't want to take the tablets".

Next the joker suggests a simple repeated gesture or words for the whole group to copy. Alternatively, the joker can give different people different gestures to copy. The aim here is to have the whole group performing simultaneously.

Improvisation

These scene titles can then be developed further through improvisation.

Improvisation can take many forms. Some examples:

1. Use the gestures in the Joker sequence to turn the images/pictures into free-form dance/movement, perhaps with freezes and word/sentences.
2. Do the images/pictures in different styles – Soap Opera, Horror Film, Musical etc.
3. Masks can be made to accentuate certain characters or elements and then incorporated into the images/pictures.
4. Images/Pictures can be turned into song and dance, perhaps to traditional tunes.
5. Use the responses/lines in the Joker sequence to create short dialogues by mixing them up. See which order works best. This can form the basis of script.

Devising and Writing

As outlined in the Introductory Notes above, it is important to research your piece to ensure that it is scientifically accurate.

In terms of content, it is important that the student performers feel that they 'own' the piece, and that they have created it themselves. But if you as their teacher have special expertise or passion for a particular subject, feel free to use this as a way to inspire and inform your students.

Some schools may choose to separate the writing and performance of the piece, and have these aspects taught by different teachers. This is an option; however all groups should play to their strengths, and take advantage of teachers' knowledge and experience.

Possible Models for Stories

These suggestions are not meant to substitute for your students' own ideas, but to offer some examples of some possible story structures which you could base your piece on.

'The Story of the Worm'

This model follows the biological history of the Bilharzia parasite from snail to human being or the history of the hookworm. It is most suitable for a movement or dance-based approach, but would have to deal with disease prevention by the end.

'The Human Story'

This approach is more "person-based", for example representing a family who are directly affected by the disease(s). How does it make real people feel when they suffer from this disease(s), and what might they do about it? This model needs lots of work on script writing and creating characters.

'The Science Story'

This model concentrates on the current scientific and medicinal approach to Bilharzia and/or hookworm, for example by featuring a doctor or scientist. This approach needs accurate and up-to-date research.

'The Political/Economic Story'

This approach concentrates on the provision of current treatment and possible future medical and political plans. It needs to focus on the reality of local economics and/or politics.

'The Mythical/Folk Story'

This model is more symbolic, and could look at how Bilharzia has been understood in the past, and how those cultural ideas still influence people in the present. This approach is well-suited to traditional performance forms.

'The Sci-Fi/Dream Story'

With this model, anything is possible. You could represent the worm as a monster and the doctor as a superhero… but the science would still have to be accurate!

All of the above are only suggestions. The most important factor in making the piece a success is that the teachers and pupils believe in what they are doing and that all participants feel a sense of 'ownership' of the show. If the audience understands that Bilharzia and hookworm are preventable and that we are all responsible for doing all we can to prevent this disease, and they enjoy the performance as well, you and your students will have achieved something impressive.

Performance

No matter what the school is able to achieve in terms of technical presentation, the final performance should have a sense of occasion to make the students feel that their efforts are worthwhile.

We recommend that all schools use some form of staging, props, and costumes.

We also recommend holding a question and answer session with the audience after the performance, to discuss the issues that the play raises,

and to find out if the "message" is getting through – and if people have enjoyed themselves!

Whatever form your performance takes, and however you choose to lead the process of creating it, we hope that it will be enjoyable and informative for participants and audience alike.

'Acting Against Worms'
Rebecca Gould and Jeff Teare, <mail@theatrescience.com>

Fiona Fleming, Becky McCall and Dr Narcis Kabatereine <f.fleming@imperial.ac.uk >

Bubo School Story

Sidubungu
Nacholo
Nereke
Ojiambo
Native Doctor
Doctor
Fishermen, Smugglers, Villagers

Scene One:
Once upon a time there was a fisherman called Sidubungu. He lived in a village called Burwodo on the shore of Lake Victoria. Sidubungu fished in the Lake.
IMAGE – Village, Lake, Fishing.

Scene Two:
Sidubungu had two wives, Nacholo who looked after the house and Nereke who was a smuggler!
IMAGE – Sidubungu, Nacholo and Nereke.

Scene Three:
Whenever Sidubungu went fishing Nereke would go smuggling. And when Sidubungu returned from fishing he would find Nereke at home helping Nacholo prepare his meal.
IMAGE – Fishing, Smuggling Cooking.

Scene Four:
When Sidubungu went fishing he used to stand in the water of the Lake. But when Nereke went smuggling, even though she had to cross the Lake, she never, ever even got wet.
IMAGE – Sidubungu in Lake, Nereke keeping dry.

Scene Five:
Sidubungu continues fishing and one day he felt sick. His stomach swelled so he looked as if he was pregnant!
IMAGE – Sidubungu ill.

Scene Six:
They tried the native doctor but he could not help so Sidubungu's oldest son, Ojiambo, who went to school and had learnt about health and medicine, suggested that they should take him to the Clinic.
IMAGE – Native Doctor, Sudubungu, Ojiambo.

Scene Seven:
So they took Sidubungu to the Clinic where he was examined. He had Bilharzia! The doctor wanted to know where Sidubungu lived and what he did. He was told that Sidubungu lived on the shore of Lake Victoria.
He was also told that Sidubungu used to go fishing barefoot. Unfortunately Sidubungu was ignorant about Bilharzia and how he could avoid it. The Doctor told him that Bilharzia was caused by a tiny worm that entered his body as he stood in the water.
IMAGE – Bilharzia worms.

Scene Eight:
The doctor treated Sidubungu and advised him never to go fishing barefoot, nor to wash or bathe in the lake water. He also told him to take the free anti-Bilharzia medicine every year.
IMAGE – Doctor, Sidubungu, Family.

Scene Nine:
When Sidubungu felt better he went around preaching to all the people in Burwodo to avoid his previous behaviour and to always use safe water from boreholes and to take the treatment every year.
SONG.
He remained healthy and Nereke carried on smuggling!

Bulekei School Story

Mother
John
Sarah
Villagers
Healthworkers

Scene One:
A few years ago in a certain village there lived a poor woman with two children, John and Sarah. They lived near the lake and the woman used to collect water for the household from the lake and, because she was poor, she used to do this barefoot.
IMAGE – Mother collecting water.

Scene Two:
Other people who lived in the village used to fish in the lake, wash their clothes in the lake and sometimes defecate in it as well! This made the water dirty. But the water was not just dirty; it had Bilharzia worms in it which had come from the faeces.
IMAGE – Fishing, Washing, Defecating.
IMAGE – Bilharzia worms.

Scene Three:
John and Sarah used to go swimming in the lake with their friends, every evening. They got ill. They had painful stomachs and diarrhoea.
IMAGE – John and Sarah swimming and becoming ill.

Scene Four:
Their mother tried to look after them but eventually she got ill too. She got breathless, especially when carrying the heavy water, and he stomach began swelling. All three of them had Bilharzia!
IMAGE – Mother, John and Sarah being ill.

Scene Five:
Luckily for John, Sarah and their mother treatment for Bilharzia took place in their village during the national Child Health Days Plus campaign and they were given medicine which made them better. They were also warned of the dangers of paddling or swimming in the lake.
IMAGE – Mother, John and Sarah being treated.

Best of all, a kind neighbour gave John and Sarah's Mother… a pair of gum boots for wearing when they went to collect water!
SONG/DANCE.

Busiabala School Story

Auma
Mother
Father
Nereke
School Children
Nanjala
Villagers
Health workers
Mourners at funeral

Scene One:
Once upon a time there lived a girl called Auma. Auma came from a poor family. Her parents could hardly afford food and clothing for the family.
IMAGE – Auma and her Parents.

Scene Two:
Auma was in Primary Five at Busime Primary School which is near the shore of Lake Victoria in the Busia district of Uganda.
At school she had a friend called Nereke.
IMAGE – Auma playing with Nereke and other Pupils.

Scene Three:
Now Nereke came from a very traditional family. And when the day came for them to take their Bilharzia medicine Nereke told Auma not to take it as it would kill her!
IMAGE – Auma not taking her medicine.

Scene Four:
Since her family were poor, Auma had to work and every evening Auma would cross the Lake to the other side to work for a certain rich woman called Nanjala. She used to wash clothes and fetch water from the Lake. After all this tedious work she used to swim in the Lake.
IMAGE – Auma going to work, working and swimming.

Scene Five:
After some time Auma started feeling sick. She had no energy and developed diarrhoea with blood in it. She had been infected with Bilharzia! However she tried to hide from her parents, and her employer, that she was sick so she still had no treatment, until her stomach started visibly swelling.
IMAGE – Auma hiding her sickness.

Scene Six:
Finally her parents took her to the Health Centre for treatment and she was given Praziquantel tablets. But, again, still believing what Nereke had told her,

she only pretended to take them, even though her mother insisted that she should.
IMAGE - Auma pretending to take the medicine.

Scene Seven:
Because she did not take the tablets she continued to be ill and dropped out of school. And she could no longer work for Nanjala.
After some time, Auma died. But Nereke, who lived near a borehole and did not have to wash clothes in Lake water and could not swim. Nereke didn't die!
IMAGE – Auma's Funeral.
SONG.

Busime School Story

Mr Haduli
Mrs Haduli
1st Child
2nd Child
Villagers
Health Workers
Doctors at Hospital
Mourners at funeral

Scene One:
Mr Haduli was a peasant and a fisherman. He lived in the village of Busime. He was a very lucky man for whenever he went fishing he caught lots of fish! He lived happily with his wife and two children and was very popular in the village.
IMAGE – Mr Haduli with Family, fishing and with Villagers.

Scene Two:
He caught so many fish that he became a very successful man and sent his children to school.
IMAGE – Children going to School.

Scene Three:
However, Mr Haduli was ignorant about the prevention and transmission of Bilharzia. He used to go to Lake Victoria barefoot to fish. Eventually he started complaining of stomach pain, loss of appetite and diarrhoea.
IMAGE – Mr Haduli being ill.

Scene Four:
Herbs were tried but they did not work. Then the villagers said that Mr Haduli should go to the local Clinic but he said that he was too busy fishing to do that. This went on for a long time
IMAGE – Mr Haduli repeatedly refusing to go to the Clinic.

Scene Five:
Eventually Mr Haduli got so ill that he was referred to a hospital where tests were done. He had Bilharzia.
IMAGE – Mr Haduli going to Hospital.

Scene Six:
But Mr Haduli had for so long refused to go to the Clinic or take the medicine that, although he was finally given drugs, it was too late for him. His body was now so weak that he could not respond to the drugs.

Mr Haduli passed away on the 22nd of July 2002 and was buried three days later.
IMAGE – Mr Haduli's funeral.
SONG.

Bwanikha School Story

Moses
Daniel
Mary
Cattle
Villagers
Doctor

Scene One:
Once upon a time there lived a man called Moses who kept cattle. His wife had died but he had one son, called Daniel, and one daughter, called Mary.
IMAGE – Moses, Daniel and Mary

Scene Two:
Daniel and Mary were good children and went to school. At the age of thirteen Daniel started helping their father with the cattle. The cattle grazed on a riverbank where there was good pasture.
IMAGE – Daniel looking after the Cattle.

Scene Three:
Daniel often saw people paddling, swimming, washing and fishing in the river. After a while he began fishing while the cattle grazed. Some of the fish he caught the family ate and some he sold to buy cassava bread.
IMAGE - Daniel fishing and eating and selling fish.

Scene Four:
Daniel often saw animals in the river like hippos and even crocodiles! What he didn't know was that there were also animals in the river that he could not see, small living organisms too small to see with the eye. These were Bilharzia worms.
IMAGE – Bilharzia Worms.

Scene Five:
After a while Daniel became ill. He felt weak, he had diarrhoea, and he lost weight. Eventually his stomach swelled into a round ball and some people in the community feared he was the victim of witchcraft!
IMAGE – Villagers fearing Daniel a victim of Witchcraft.

Scene Six:
Finally Daniel went to see a doctor and was advised to take a laboratory test. It was discovered that he was not bewitched but that he had Bilharzia. He had the Bilharzia worms in his body!

IMAGE – Daniel with the Doctor.

Scene Seven:
Daniel was given medicine and got better. His parents and the community accepted that it was Bilharzia and not Witchcraft and that they all had to avoid places where the tiny worm might infect them. They also learnt, even if they did not think they were infected, to take the free tablets for Bilharzia every year just in case!
SONG.

Lumuli School Story

Luwande
Namudira
Villagers
Health Workers

Scene One:
Once upon a time there lived a poor man called Luwande who had a wife called Namudira. Namudira used to wash the clothes of well-off families to make a little money. She used to wash the clothes in the lake.
IMAGE – Luwande and Namudira, Namudira washing clothes.

Scene Two:
Luwande and Namudira had no children. Luwande wanted children but Namudira didn't think they could afford it but she decided to join the Family Planning to get some advice.
IMAGE – Namudirsa joining Family Planning.

Scene Three:
After a while Namudira became ill. She lost her appetite and her stomach became swollen. When Luwande saw Namudira's swollen stomach he hoped she was pregnant!
IMAGE – Luwande hoping Namudira is Pregnant.

Scene Four:
Luwande gathered the community together and asked them what he should do. They said Namudira should have a medical check-up at the local clinic.
IMAGE – Community Meeting.

Scene Five:
When the results came it was discovered that Namudira was not pregnant but that she did have Bilharzia!
IMAGE – Namudira Getting her Results from Medical Worker.

Scene Six:
Namudira was given medicine and she got better and in that very same week some health workers came to their community and told them about Bilharzia and how to avoid it and how to get the free treatment through the national Child Health Days Plus. So they all learned how to stay safe from the Bilharzia worm!
SONG.

Lunyo School Story – The Confusing Bilharzia Worm

Masinde
Mother
Fishermen
Friends
Doctor
Villagers (Relatives)

Scene One:
Once upon a time there lived a boy who lived in a village called Siguma, his name was Masinde. Masinde's father died when he was just two years old. His mother looked after him but unfortunately she died when Masinde was in Primary Six so he became a total orphan with no-one to provide for him.
IMAGE – Masinde's Mother dying.

Scene Two:
Since Siguma was on the lakeside Masinde decided he would go fishing. He fished at weekends and during the holidays and sold the fish to pay his school fees and buy food, clothes, books etc.
IMAGE – Musinde Selling Fish.

Scene Three:
Masinde thought that you caught Bilharzia by drinking water from the lake so he did not do this. But he did stand in the water when fishing and swim in the lake.
IMAGE – Musinde Fishing.

Scene Four:
Masinde managed to make enough money fishing to get his O Levels but eventually he began to feel sick. His friends told him to go to the Health Clinic to take a test to see if he had Bilharzia but Masinde thought that as he never drank lake water ho could not have. So he did not go.
IMAGE – Musinde refusing to go to the Health Clinic.

Scene Five:
But eventually he got so sick his friends took him to the hospital. It was discovered that he did have the Bilharzia worms. The doctor told him that you didn't have to drink the lake water to get the Bilharzia worms, they could enter your body even if you just stood in the lake!
IMAGE - Musinde with the Doctor.

Scene Six:
Masinde blamed himself for his ignorance and for not getting treatment earlier, but he got better. He also got a lot of information about the spread of the Bilharzia worms and how Bilharzia affects people. When he left the hospital Masinde began sharing this information with his relatives and friends. He also encouraged them to take the free annual treatment each year, even if they thought they were not infected.

SONG.

Nanyuma School Story

Mr Olumbe
Mrs Olumbe
Five Children
Neighbour(s)
Health workers

Scene One:
In Mahombi Village near Lake Victoria there lived a man, his wife and their five children. He was called Mr Olumbe and his wife was called Margaret.
IMAGE – Mr Olumbe and his Family.

Scene Two:
Mr Olumbe's main activity was fishing both to eat at home and to sell. He often took all his children fishing with him. His wife enjoyed this as it meant she could get all her own work done without the five children getting in the way. Mrs Olumbe never went to the Lake.
IMAGE – Mr Olumbe and Children going fishing, Margaret staying at home.

Scene Three:
Mr Malumbe used to go fishing in bare feet, not knowing that he could get Bilharzia this way. The children would also go swimming in the Lake. Soon enough Mr Malumbe and his five children began to get ill. Their stomachs started to swell but they did not know that they had Bilharzia, they thought that it was witchcraft!
IMAGE – Mr Malumbe and his Children being ill.

Scene Four:
Mrs Malumbe did not get ill and tried to look after her husband and her five Children but it was hard, and now they had no fish to eat!
IMAGE – Margaret trying to look after her sick family.

Scene Five:
One day they were so ill that a Neighbour suggested that they should be taken to the local health Clinic for a medical examination. The results proved that they all had the Bilharzia worm. At the health Clinic they were told that the Bilharzia worm entered their bodies through their bare skin.
Image – The sick family going to the Clinic.

Scene Six:
They underwent treatment, and, after a while, got well.
And they never went fishing in bare feet again, or Swimming in the Lake, and each year during the national Child Health Day Plus campaign they received the free treatment
IMAGE – The Family healthy and taking free treatment.
SONG.

Serere School Story

Ongoro
Ochom
Ajambo
Opelli
Fishermen
Health workers

Scene One:
Once upon a time there lived a man called Ongoro. Ongoro had three children, Ochom, Ajambo and Opelli who all went to school. Ochom and Ajambo were keen students but Opelli wasn't, he admired the local fishermen because they were smart and well-off.
IMAGE – Ochom and Ajambo liking school, Opelli preferring Fishing.

Scene Two:
One day Opelli approached the fishermen and asked them what he would require to start fishing himself. They told him to buy a hook for 100 shillings. Opelli bought a hook and the next morning, instead of going to school, he went fishing!
IMAGE – Opelli with the Fishermen.

Scene Three:
At first Opelli was afraid to actually step into the Lake while fishing but the others told him that he would get more fish if he did so, so he did.
IMAGE – Opelli stepping into the Lake.

Scene Four:
Opelli caught many fish which he sold before going home. He made so much money fishing that he began helping his other family members by paying their school fees and buying books and pens. Not only that but he also bought food and goods for the home.
IMAGE- Opelli bringing food and goods home.

Scene Five:
Opelli spent all his time fishing on the lake shore. He became well-off and bought everything for the house but, eventually, he fell sick. He lost his appetite, he lost weight and had diarrhoea. He got so ill that he was taken to the health Clinic where they carried out tests on him. He had Bilharzia worms!
IMAGE – Opelli at the Clinic.

Scene Six:
Opelli was given tablets which made him better. He was also told to take the free medicine every year. Opelli went home and told his family members not to use lake water for washing and to try to avoid going into the water, even for fishing!
SONG.

Acting Against Worms (AAW)

Knowledge, Attitude and Practice (KAP) Questionnaire

Interviewer		Date	
School Name		Sub-county	
Pupil Name		ID Number	
Age		Gender	

Interview details and Individual Consent

My name is ……. I am conducting research for the Ministry of Health about KAP in relation to Bilharzia in this area. We would like to understand what you know about Bilharzia. We are interviewing 50 children in your school and in total 18 schools in the district of Busia.

Purpose of research: The research will help the national Bilharzia and worm control programme to know whether by introducing drama as a health education tool we will increase peoples understanding of Bilharzia.

Procedure: If you agree with the purpose of this research then I will question you about your knowledge in relation to Bilharzia. The questioning will last between 15 to 20 minutes.

There are no direct benefits for you being part of this research. However, your contributions will help the Ministry Of Health to develop better health education practices to help communities to correctly recognise signs and symptoms of Bilharzia, prevention infection and to get appropriate treatment for infection. You are free not to take part in this research or not to answer any question that you feel uncomfortable with or even to leave the interview without consequences. Confidentiality is guaranteed and your answer will be part of many schoolchildren interviews so the information you give us will be anonymous i.e. your name will not be appear in any oral or written report of this study. There are no right or wrong answers. Your openness and honest opinions are extremely important. In case you do not understand a question, please ask me to repeat or to clarify.

Do you agree to participate in this interview? **Yes** **No**

Background

Q1: Where do you get water for washing, cleaning, bathing in your household?

Q2: How many times a day do you visit the lake or river?

Q3: What are your main reasons for visiting the water? *(tick all that apply)*

- Washing?
- Fishing?
- Defecating?
- Playing?
- Cooling off?
- Other (please specify)_____

Knowledge about Bilharzia and Transmission

Q4: Have you heard anything about Bilharzia?

Q5: If yes to Q 4, where did you hear about Bilharzia from? *(tick all that apply)*

- Friend
- Family member
- Teacher
- Community Health Worker
- Political/community leader
- Posters and pamphlets
- Comic book (book with pictures)
- Radio
- School announcement
- Church
- Other_____
  _____

Q6: Have you or any family member suffered from Bilharzia?

Q7: How does a person get Bilharzia? *(tick all that apply)*

- Drinking contaminated water
- Collecting contaminated water
- Poor hygiene/sanitation habits
- Bathing/swimming in the river
- Bathing swimming in the lake
- Others: _____

Q8: How does Bilharzia get passed from one person to another?

- Infected person defecating in the water
- Witchcraft
- Eating food
- Drinking contaminated water
- Poor sanitation
- Other_____

Q9: If you have a problem with Bilharzia, who do you ask for help in your village?

- School teacher
- Parent

- Traditional healer
- Community drug distributor
- Community health worker
- Religious leader
- Community/political leader
- Other *(please specify)*_____

Knowledge of Bilharzia Prevention

Q10: Do you think getting infected with Bilharzia can be prevented?

Q11: How can Bilharzia infection be prevented?

- Health education
- Treatment for all infected persons
- Treatment of the water source
- No swimming in contaminated water
- No bathing in contaminated water
- Collecting water from a protected water source
- No defecating in contaminated water
- Other_____

Q12a: Does your compound have a latrine?

Q12b: If yes to Q12a, do you use the latrine?

Q12c: If no to Q12a, if a latrine was built in your compound do you think that you would use it?

Q13a: Does your school have a latrine?

Q13b: If yes to Q13a, do you use the latrine?

Q14a: Would you like to know more about how to prevent Bilharzia?

Q14b: Why?

Q15a: Do you think your community could do more to prevent Bilharzia?

Q15b: If yes to Q15a, what could they do?

Knowledge about Bilharzia Symptoms and Treatment

Q16: What are the possible signs symptoms of Bilharzia infection?

- There are no signs and symptoms (you do not know you have it)
- Stomach ache

- Diarrhoea
- Bloody diarrhoea
- Tiredness
- Fever
- Headache
- Nausea/Vomiting
- Others_____

Q17: How does a person find out that they have Bilharzia?

Q18: Have you ever taken treatment for Bilharzia?

Q19: What type of medicine did you take?
- Traditional medicine
- Tablets
- Other_____

Q20: Where did you receive this treatment for Bilharzia?
- Health centre
- Pharmacy
- Traditional healer
- Mass treatment campaign (school)
- Other *(specify)*_____

Q21a: Have you ever suffered side-effects from the Bilharzia treatment?

Q21b: If yes, please specify

Q21c: If yes, where did you seek help for your side-effects?

Q22a: If you have no signs or symptoms for Bilharzia do you think you need to take treatment?

Q22b: Why?

Q23: Do you think if you have Bilharzia and are not treated you will die?

Q23a: Why?

THANK YOU FOR PARTICIPATING IN THIS INTERVIEW

Ohuhoha Hu Bibuha

Amakesi, Ebibaso Nende Ota Muhola Ebitebo
Ohutebwa Mubuleyi Nende Efikirisania

Interviewer		Date	
School Name		Sub-county	
Pupil Name		ID Number	
Age		Gender	

Interview details and Individual Consent

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Do you agree to participate in this interview? **Yes** **No**

Enjaka

Q1: Wendanga ena amachi akohwosa, ohulabwa ohweyoka munyumba yawo?

Q2: Mahabi kanga muludalo kocha munyanja oba mumwalo?

Q3: Songa sina chene ehuhundi echikeranga nocha hu machi? *(hebera esichirayo)*

- Ohwosa
- Ohunaaba
- Ohunia
- Ohubaya
- Ohwenyisa
- Ebindi *(bibole)*_____

Amakesi Akadira Hu Bilharzia Nende Esasania Yabwo

Q4: Wawuhiraho ebwa Bilharzia? **yee** **haba**

Q5: Nikali mbwe yee hu Q4, ena yiwa wulirira? *(hebera bwosi ebichirayo)*

- Omwicha
- Ebeedaala
- Omusomesa
- Owebwo buyonjo
- Omutuki
- Hubitimbe nende mu papula, nyandike
- Mu bitaabo
- Nahalondo
- Omulanga huryekero
- Mukehesia
- Ebindi *(bibole)*_____
  _____

Q6: Walihowo hwe we nende owedaala hyengwe eyaliho nende Bilharzia? **yee** **haba**

Q7: Omundu afuna atie Bilharzia? *(hebera bwoti ebichirayo)*

- Ohungwa amachi mabi
- Ohudaya amachi mabi
- Obuchafu nende eminyira ehobutaleresa yihumenyere
- Ohweyoka/ohusoga mu luchi
- Ohweyoka /Ohsoga munyanja
- Ebindi *(bibole)*_____

Q8: Bilharzia yidira yetie omundu ohatula huwundi? *(hebera bwoti ebichirayo)*

- Omundu alinabwo ohia mumachi
- Witchcraft
- Eating food
- Drinking contaminated water
- Poor sanitation
- Ebindi *(bibole)*_____

Q9: Noli nesidinyu nendi bilharzia nanu mulukongo lwawo yosaba obuhonyi?

- Omwekesa werekero
- Omwibusi
- Omulesi
- Okabanga omusala
- Owebwo buyonjo
- Omuhulundu wabyedini
- Omutuki
- Ebindi *(bibole)*_____

Amakesi Huhukayirisa Bilharzia

Q10: Obasirisa oti odiribwa nende Bilharzia luyala okayirirwa? **yee** **haba**

Q11: Odiribwa nende Bilharzia hwekayirira hutei? *(hebera bwoti ebichirayo)*

- Amosomo ka bwo bulamu
- Ohera abalwayu bosi
- Ohurera abalinabwo
- Ohurera emialo chosi
- Obutasoga mumachi mabi
- Obuteyoka mumachi mabi
- Ohucha amachi mumwalo miterese
- Obutania mumachi mabi
- Ebindi *(bibole)*_____

Q12a: Ohwanyi hwawo hurimo echoroni? **yee** **haba**

Q12b: Nakali yee hu Q12a, wehonyera echoroni? **yee** **haba**

Q12c: Nakali haba hu Q12a, echoroni niyombahibwa mulwanyi lwawo obasa ocha oyihosesa? **yee** **haba**

Q13: Eriekeri lyengwe riri nende echoroni? **yee** **haba**

Q13a: Nakali yee hu Q13a, oyihosesanga? **yee** **haba**

Q14a: Wahadaha ohumanya ebingi ebidira huhuka yirisa Bilharzia? **yee** **haba**

Q14b: Husina?

Q15a: Obasa oti abandu besitudu syawo banyala bahola ebingi huhwekaya Bilharzia? **yee** **haba**

Q15b: Nakali yee hu Q15a, sina sibahahola?

Amakesi Kadira Huhweyekasa Hwa Bilharzia Nende Ehwerera

Q16: Bwobeneraho sina ebyekesa ohdiribwa hwa Bilharzia?

- Aumamo ebyekesa nende ebyoboneraho (si wa hamanya noli nabwo)
- Enda ohuchuna
- Onyalala
- Onyalala amabanga
- Obujongu
- Omuyaka / okulwala bakata (omusuja)
- Omutwe ohumaka
- Osala / omwoyo ohusyuha
- Ebindi *(bibole)*_____

Q17: Omundu amanya atie nali nende Bilharzia?

Q18: Wafunaho ohurerwa hwa Bilharzia? **yee** **haba**

Q19: Malesi sina kawehonyera?

- Ekesimari
- Amakarenda (emisala)
- Ebindi *(bibole)*_____

Q20: Wafunira enawene ohurerwa hwa Bilharzia?

- Health centre
- Pharmacy
- Traditional healer
- Mass treatment campaign (school)
- Ebindi *(bibole)*_____

Q21a: Wafuna ho obudinyu bwosi obwafula huhulera hwa Bilharzia? **yee** **haba**

Q21b: Nakali yee Q21a, bibole?

Q21c: Nakali yee Q21a, wafuna ena obuhonyi hu bidinyu biwafuna?

Q22: No wuma ebwekesa ne bwoboneraha obwa Bilharzia obasa oti onyala ehurerwa?

yee **haba**

Q22a: Husina?

Q23: Obasa oti omundu nawuma Bilharzia handi siba marerere anyala ohafwa?

yee **haba**

Q23a: Husina?

THANK YOU FOR PARTICIPATING IN THIS INTERVIEW

'Acting Against Worms'

Schistosomiasis Control Initiative (SCI)/Vector Control Division, Uganda Ministry of Health (VCD)/Theatrescience Public Health (Bilharzia) School Drama Project in Busia, Uganda – 2009-10

Short Report

Introduction

This report is written from the perspective of Theatrescience and shares details of the 'Acting Against Worms' (AAW) project, which took place in Uganda, from October 2009 until April 2010. Rebecca Gould and Jeff Teare were the theatre practitioners on this health initiative, which aimed to create drama pieces in order to share important health messages about the prevention and treatment of the debilitating disease Bilharzia. The project was instigated by Fiona Fleming of the Schistosomiasis Control Initiative (SCI) based at Imperial College, London; Narcis Kabatereine of the Vector Control Division (VCD), Department of Health, Ugandan Government and Becky McCall, freelance science journalist. Fiona and Becky made the initial application to the Wellcome Trust and Fiona set up and project managed the first stage of the project: a seven-day visit to schools in the Busia district of Uganda. However, as Fiona and Becky were both pregnant, neither was able to attend the final stage of the project; a second seven-day visit to Busia in April 2010. Narcis was supportive throughout and drove down expressly to attend the final Festival. Rebecca and Jeff delivered all stages of the project throughout.

AAW was funded by the Wellcome Trust through its International Public Engagement Award. The project's initial objectives were:

- To create a drama-based initiative aimed at improving understanding of and public engagement with health messages related to preventing and controlling intestinal worms amongst rural communities in Uganda

- To actively involve school children through the medium of drama

Theatrescience advised Fiona and Becky on the writing of the application in 2008 and was pleased to be asked to deliver the drama content in July 2009.

Participating primary schools were chosen in the Lumino region of Busia, Uganda. They were agreed on by Fiona, Moses Adriko (VCD) and local vector control officer Robert Malimba. A local Community-Based Organisation (CBO) was recruited by Robert to work with Theatrescience on the drama elements of the project

First Visit

This took place in October 2009. Fiona was already in Uganda; Becky, Rebecca and Jeff joined her in Busia.

On the first day an In-Service Training Workshop was held, exploring methods of devising drama and performance, the biology of Bilharzia and incorporating the messages about the prevention and treatment of the disease. Teachers from all the participating schools attended plus the CBO members (Anjera Nabwire, Gertrude Mirembe, Okuku Wycliffe and Titus Wabwire).

Over the next five days, workshops for twenty Year Six students were held in each of the nine participating schools: Nanyuma, Lumuli, Busime, Bubo, Bwanikha, Sirere, Lunyo, Busiabala and Bulekei. The workshops were led by Rebecca and Jeff with input on health advice from Robert and Fiona. The workshops concentrated on storytelling exercises, and activities based on making physical images to communicate narrative. They also incorporated the sharing of local songs and dances. The biology of Bilharzia and the latest health advice was communicated by Robert, and all participants were encouraged to ask questions and to discuss why carrying out the health advice was often difficult or even impossible.

During each workshop two students were selected to lead their group. They were given an Airmail envelope and their main job was to collate all of the students' ideas and develop them into one story; this would then be sent to Theatrescience in the UK over the Christmas break.

Very early in the workshop process it became apparent to us that the general awareness of the students about the prevention and treatment of Bilharzia was good. However, it also became clear that there were a number of social, economic and behavioural issues with applying this awareness. The problems they stated included:

- too far to travel to a safe water borehole
- queuing for and pumping the water at boreholes took too long

- parents and other adults preferred lake water as they said the borehole water was salty
- necessary to fish in Lake Victoria not only for their own food but for fish to sell, to make money for themselves and their families
- they received treatment for Bilharzia from SCI/VCD every year anyway why should they bother avoiding infection?

Story to Scenario

All the participating schools sent stories to Theatrescience in the UK, some with artwork attached, which was uploaded to the Theatrescience website (see www.theatrescience.org.uk, where video of the project is also available).

Jeff adapted these stories into scenario form. Fiona, Rebecca and Becky then contributed to the process with Fiona making some necessary biological science changes.

The scenarios were then emailed to Robert in Busia who distributed them through the CBOs back to the schools.

The CBOs then revisited the schools and began the process of turning the scenarios into a fully realised performance.

Second Visit

Rebecca and Jeff returned to Uganda in April 2010. They were met by Edridah Muheki from VCD in Kampala before driving to Busia, where they were introduced to the District Health Director and Deputy Admin Officer.

Two schools were visited on the first afternoon by the whole team but in order to speed the process up, and to allow more time for detailed reworking of the performance pieces, it was decided to split the team on the second day.

The team visited seven schools on the second day. Only one of the nine schools (Bulekei, also chosen as the Festival site) had not developed a performance piece. The whole team were delighted by the obvious commitment shown by the eight

schools. They had all produced pieces of theatre which, whilst varying massively in style, length and subject matter, shared a common energy and enthusiasm for performing and for telling stories. The performances had been rehearsed outside, generally underneath the largest tree in the playground. Often pupils and teachers had to overcome a list of obstacles: non-expert teachers; regular pupil and teacher absence; illness; blazing sunshine and rehearsals being watched by hundreds of other children. Despite this all eight schools that had completed the task were proud of their achievements and excited about sharing their hard work with us.

Five schools were chosen to present their work at the culminating Festival. On the third and fourth day the whole team visited all five schools at least once to work on the pieces. All of the rehearsals/run-throughs in schools were witnessed by other pupils, in one case by the entire rest of the school. Peer learning appeared to take place during these rehearsals.

Some biological information had to be corrected. One school seemed to think that being infected by a Bilharzia worm was akin to being stung by a wasp. Another over-estimated the prophylactic effects of boiling lake water, which is more useful for non-Bilharzia infections.

The main aspects of re-rehearsal were 'show doctoring', speeding up the action, improving the use of stage space and getting the students to be louder ('Amakulu!') and faster ('Mangu!').

Festival

The Festival took place on the 10th April on the playing field of Bwanikha School. An audience of over three hundred finally assembled (having been scheduled to start at 9.30am, the Festival commenced at 10.50am). The audience consisted of non-performing school groups, parents, students from the adjoining technical college, members of the general public and various local politicians and dignitaries, who gave speeches of varying lengths between the performances.

All five schools acquitted themselves well, especially in terms of open-air audibility and improvised props and costumes. However some of the pieces were considerably longer than they had been in rehearsal. Two local adjudicators had been recruited, who carried out their task extremely thoroughly and were able to give very detailed scores and feedback on all of the pieces at the end. They gave

the schools percentage marks in various categories, including effectiveness of message, stagecraft, acting and audibility. Sirere School was declared the overall winner - perhaps because of the high quality of their singing, dancing and drumming - and were presented with a goat as first prize by the Guest of Honour, a local politician. The SCI presented footballs to all participating schools and Theatrescience provided sweets.

Observations and Comments

The general level of awareness about the prevention and treatment of Bilharzia among participating students seemed fairly high but various misconceptions had to be corrected by the project team through the process.

The level of commitment to the project was high in the eight schools that created pieces of drama. The organisation of the project by the Uganda team (Edredah, Moses, Robert et al.) was generally excellent, again under sometimes difficult circumstances

Peer learning almost certainly took place in schools and the Festival seemed to raise the profile of Bilharzia prevention and treatment locally but we will have to wait for the full evaluation to know more.

Our learning curve was huge: theoretically, practically and, especially, culturally. The practicalities of running workshops and rehearsals with no electricity, little equipment and often in the open air needed some degree of improvisation and the cultural differences sometimes caused minor embarrassment (e.g. Jeff's pronunciation of 'Amakulu' which sometimes came out to mean 'legs').

Narcis Kabatareine said after the Festival that he hoped 'this was just the beginning'. If more work is to be undertaken we recommend addressing the following issues:

While the teachers and the Busia Drama Team (CBOs) were extremely committed and enthusiastic, they requested further training to be able to carry out the task more fully.

More expert intervention into the schools between the two Theatrescience visits would have helped; monitoring of progress in schools did not really happen.

The CBOs visited the schools between February and April perhaps two or three times but unfortunately no information was shared with the SCI or Theatrescience. Better communication would have, for example, flagged-up that Bulekei was struggling.

The perhaps over-strict adjudication of the Festival, awarding a last as well as a first position, is not something that Theatrescience would support. Also the exclusion of three schools from, at least performing at, if not attending, the Festival was not handled well. Some of the schools turned up clutching their props and costumes, expecting to perform only to be told they weren't.

However, overall we consider the 'Acting Against Worms' project to be successful and very worthwhile. And, congratulations to Fiona, Becky and Gertrude for giving birth half way through!

Theatrescience
April 2010.