

## Evaluation of a comprehensive school-based AIDS education programme in rural Masaka, Uganda

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### Abstract

A 19 activity extracurricular school-based AIDS education programme lasting 1 year was conducted in rural southwestern Uganda using specially trained teachers, and was evaluated using mutually supportive quantitative and qualitative methods. In total, 1274 students from 20 intervention schools and 803 students from 11 control schools completed questionnaires at baseline, and their classes were followed up. In addition, 93 students from five of the intervention schools participated in 12 focus group discussions. The programme had very little effect—seven of the nine key questionnaire variables showed no significant increase in score after the intervention. Data from the focus group discussions suggest that the programme was incompletely implemented, and that key activities such as condoms and the role-play exercises were covered only very superficially. The main reasons for this were a shortage of classroom time, as well as teachers' fear of controversy and the unfamiliar. We conclude that large-scale comprehensive school-based AIDS education programmes in sub-Saharan Africa may be more completely implemented if they are fully incorporated into national

curricula and examined as part of life-skills education. This would require teachers to be trained in participatory teaching methods while still at training college.

### Introduction

Seventy percent of all current HIV infections occur in sub-Saharan Africa, where an estimated 24.5 million people carry the virus (UNAIDS, 2000) and where in many areas infection rates continue to rise sharply (Wilkinson, 1999). Strategies to address this unacceptable situation should ideally include the promotion of safe sexual behaviour for adolescents and young adults, who tend to be at higher risk than the rest of the population. Not only can comprehensive AIDS education for this age group make people aware at the individual level of the need to protect themselves from infection, but it can also bring about gradual changes in the wider social environment, which in turn can determine whether or not safer sex is acceptable in a given situation.

In order to conduct effective AIDS education, however, it is clearly vital that interventions are relevant to the target population and that they are properly evaluated so that possible improvements can be identified for future programmes. Fortunately, a reasonable amount is known about the social context in which sexual negotiation and activity take place among young people in Africa. The design of relevant interventions should therefore be feasible.

For example, it is recognized that pre-marital sexual activity has a high value for many in this group (Standing and Kisekka, 1989; Renne, 1993;

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Kinsman *et al.*, 2000), and that peer pressure and powerful social norms play a major role in encouraging it (Twa-Twa, 1997; Amuyunzu-Nyamongo *et al.*, 1999; Varga, 1999). Some financial or other material transaction is also often involved (Nnko and Pool, 1997; Nyanzi *et al.*, 2001). Even though condom use is increasing in many countries, sexual contacts are frequently unprotected (Abdool-Karim *et al.*, 1992a; Agyei and Epema, 1992; Asimwe-Okiror *et al.*, 1997; Konde-Lule *et al.*, 1997; Caldwell, 1999) and strong community resistance to teaching about or providing young people with condoms has been reported (Twa-Twa, 1997; Abdool-Karim *et al.*, 1992b; Kinsman *et al.*, 1999). Furthermore, while awareness about HIV/AIDS may be relatively high in some contexts, 'most studies suggest a combination of adequate knowledge and continued high-risk behaviour' (Varga, 1999). All this goes a long way towards explaining the enormous scale of the HIV/AIDS epidemic throughout the region, but it also provides an invaluable platform on which AIDS educators can base their work.

In spite of this fairly broad knowledge base on the sociology of sex among young Africans, however, the number of evaluated and published AIDS education programmes aimed at the youth from the region has been disappointingly low. Knowledge about the potential impact of such programmes, as well as the ways in which they may be improved, is therefore quite limited.

In the context of our own school-based AIDS education programme, we have identified just nine such evaluation studies. Unfortunately, four of these did not use control or comparison groups in their evaluations (Evian *et al.*, 1990; Kuhn *et al.*, 1994; Visser, 1996; MacLachlan *et al.*, 1997), which means that even if valuable lessons may have been learned, there is no reliable basis for arguing one way or the other about the actual impact of any of these interventions. The remaining five studies (Klepp *et al.*, 1994, 1997; Fawole *et al.*, 1999; Fitzgerald *et al.*, 1999; Shuey *et al.*, 1999; Harvey *et al.*, 2000), which evaluated interventions in Tanzania, Nigeria, Namibia, Uganda and South Africa, respectively, did include compar-

ison groups in their analyses and they all reported success in their programmes.

The body of evidence available to us today therefore suggests that AIDS education for young Africans works. However, while of course it is encouraging to learn that such interventions *can* work in Africa, it seems unlikely—as the literature suggests—that they *always* work. After all, if every AIDS education initiative in Africa succeeded, one would probably not expect the epidemic to have reached the catastrophic levels that prevail throughout the region.

Given this background, it is vital that more studies are conducted, based on sound theory, solid understanding of the relevant sociological context and correct statistical analysis. Furthermore, the lessons learned from these studies must be disseminated and put into practice. The aim of this paper, therefore, is to contribute to this task by assessing a large school-based AIDS education programme in rural Masaka, Uganda—which could in theory be replicated on a larger scale and which could therefore guide the development of a national programme—using mutually supportive quantitative and qualitative methods.

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## Methods

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### Background, study design and participants

The Medical Research Council (MRC) Programme on AIDS in Uganda has recently concluded a large community-based intervention trial in 18 randomly selected parishes of rural Masaka district. The trial examined the potential efficacy for HIV prevention of an Information, Education and Communication (IEC) strategy, both alone and in combination with improved STD management.

The 18 parishes, chosen from an eligible total of 25, were divided into three arms of six parishes each. The intervention in Arm A consisted of IEC alone, while that for Arm B consisted of exactly the same IEC package, but with the addition of an improved syndromic STD management system in government and private health clinics. Arm C acted

as a control, with community development projects and groups of home care volunteers trained by the MRC. Social marketing of condoms as well as voluntary HIV testing and counselling were provided throughout the 18 parishes. The trial began in 1994 and ended in mid-2000.

The IEC component of the trial consisted of community- and school-based interventions in Arms A and B. The community-based programme revolved around teams of community educators in each parish, as well as locally produced drama and video shows, while the schools programme was teacher led. The present study, conducted between March 1997 and October 1998, seeks to assess this latter programme.

Sixty-seven schools from the 12 IEC parishes were eligible to join our programme, based on the fact that they had a Primary 6 class or higher. These were all invited to take part and only one refused.

The quantitative part of the study is based on longitudinal questionnaire data collected from 20 of the intervention schools (60% primary and 40% secondary; eight from Arm A and 12 from Arm B), all from the last five parishes to enter the study (the process was staggered). Since the schools programme package was identical in all participating parishes, data from Arms A and B could be combined and then compared with data from the 11 randomly selected control schools (64% primary and 36% secondary; all from Arm C). Unlike the overall trial, which had three arms, the quantitative component of this study was therefore two armed.

Qualitative data concerning students' views of the programme were also collected from students during Focus Group Discussions (FGDs) in five of the intervention schools, one each from the same five parishes which contributed questionnaire data.

### **The programme**

Our school-based AIDS education programme took place in the context of a curriculum where AIDS education in Ugandan schools was quite limited. The official Health Education curriculum included a short section in the last year of primary school in which teachers were expected to describe 'the

causes, transmission, signs, effects, prevention and control of the following sexually transmitted diseases: gonorrhoea, syphilis, AIDS' (Basic Science and Health Education Syllabus for Primary schools in Uganda, no date). While this may appear comprehensive, coverage of the topic tended in reality to be quite superficial. No AIDS education at all was required in secondary school. Recently, however, a Life Skills Education Initiative (LSEI), that includes a wide variety of topics including HIV/AIDS, has been introduced to teacher trainees still in college. In time, LSEI should become a regular part of the curriculum in all schools.

Our programme was an adapted version of WHO/UNESCO's *School Health Education to prevent AIDS and STD—A Resource Package for Curriculum Planners* (WHO/UNESCO, 1994), which, as far as we are aware, has not previously been evaluated. It is a comprehensive teacher-based package aimed at 12–16 year olds, and it includes basic information about HIV/AIDS, caring for people with HIV/AIDS, role-play activities, condoms and negotiation skills. Nineteen of the package's 53 student activities were chosen for our programme (see Table I). Selection was based both on our collective subjective opinion regarding which activities were likely to be most relevant to the youth of rural Uganda and also according to the theoretical requirements of the Masaka Intervention Trial (see 'Theoretical background' below). In addition, the selection process recognized that knowledge of AIDS alone may be insufficient to bring about sustained healthy sexual behaviour. Hence, activities were both didactic and participatory, which complement each other in promoting healthy behaviour (WHO, 1992).

It was intended that the programme should be taught over a 10–12 month period in each school. It was to be covered on an extracurricular basis, insofar as lessons and activities would take place in addition to the normal scheduled curriculum. According to teachers' discretion, they would either be incorporated into existing lessons or taught during out-of-school hours. In general, classes in upper primary and lower secondary schools have six to eight science classes each week (which

**Table I.** Student activities in the Masaka schools programme

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Unit 1: Basic information about HIV and AIDS
STD, HIV and AIDS—what do they mean?
STD, HIV and AIDS—basic questions and answers
Short quiz
How a person gets HIV
You can't get AIDS by...
Another quiz
Levels of risk for different activities
Are you at risk?
Unit 2: Responsible behaviour; delaying sex
Reasons to say NO
To delay or not to delay...
Practical hints to help delay sex
How to show affection without sex
Assertive, passive and aggressive behaviour—am I assertive? (Short role-play exercise)
How to deliver an assertive message
Your assertive message
Extended role-play exercise
Unit 3: Responsible behaviour; protected sex
The condom and how to use it
Unit 4: Caring for people with AIDS
How to care for someone with AIDS
How to keep yourself safe

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would include health education) out of a possible total of 40, and between zero and three free periods. Some of these, we hoped, would be available for teaching our programme.

Two teachers from each participating school—in most cases a science teacher and the senior woman—attended a year-long series of three training and evaluation workshops, which totalled 5 days, held in each of the trial's 12 IEC parishes. These teachers were then expected to introduce and cover the programme in the eligible classes in their respective schools. The workshops gave the context of the programme with respect to the epidemiology and sociology of the Ugandan and sub-Saharan HIV/AIDS epidemic, described in detail each of the 19 student activities, and also gave teachers the chance to learn through group discussions, presentations and role-play activities.

We were aware that resistance to the discussion of condoms would probably be encountered in some communities, so we asked teachers to tackle the subject in as much detail as they felt was appropriate.

Several visits were made between workshops to each of the 66 schools, partly to distribute student activity worksheets, but also to attempt to establish how teachers were managing with the programme. Because of the large size of the district and the number of participating schools, we did not seek as a rule to oversee activities in the classroom. Supervision therefore took the form of answering queries during visits and training workshops, and occasionally observing lessons.

Further details, as well as the views of implementing teachers, are given elsewhere (Kinsman *et al.*, 1999).

### Theoretical background

During the past 25 years numerous theories have been developed to explain and predict health-related behaviour. These include the Health Belief Model (Rosenstock, 1974a,b), the Theory of Planned Behaviour (Ajzen, 1985), the Theory of Reasoned Action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Terry *et al.*, 1993), Self-Efficacy Theory (Bandura, 1989), the Morin Model (Morin and Batchelor, 1984) and the Information–Motivation–Behavioural Skills Model (Fisher and Fisher, 1992).

It has been argued that theory will enhance understanding of both the success and failure of interventions. However, there has been criticism that some theories focus excessively on explanation and prediction, and that they have little application as far as the design, implementation and evaluation of actual interventions are concerned (Leviton, 1989; Hochbaum *et al.*, 1992; van Ryn and Heaney, 1992; McCamish *et al.*, 1993). Furthermore, while some theoretically based interventions have influenced antecedents to behaviour such as knowledge and attitudes, they have had disappointing effects on risky behaviour (Hughes and McCauley, 1998). In addition, many theories ignore the role of irrationality (McDermott, 1998).

The MRC's Masaka schools programme described in this paper has been influenced by the Behavioural Changes for Interventions (BCI) Model (King and Wright, 1993). The BCI Model, which, unlike many other theories, was developed

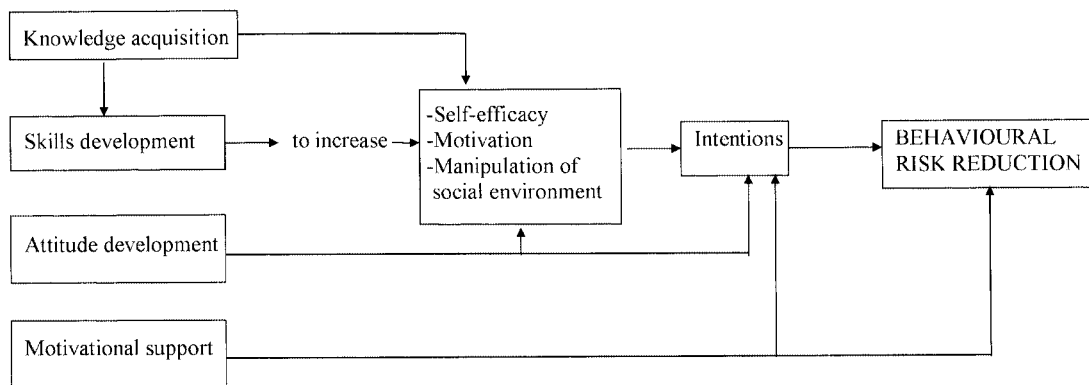


Fig. 1. Theoretical basis of the Masaka schools 'programme' based on the BCI Model (King and Wright, 1993).

specifically to guide the development of interventions, is closely related to the Theory of Reasoned Action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1985) and, especially, the Information–Motivation–Behavioural Skills Model (Fisher and Fisher, 1992). The four primary antecedents to behavioural risk reduction, as identified by the BCI Model—knowledge acquisition, attitude development, motivational support and skills development—and their relationship to behaviour change and risk reduction are illustrated in Figure 1. These four antecedents are considered by the authors of the WHO/UNESCO resource package on which we based our programme to be of central importance to any successful STD or AIDS education programme.

### Design and administration of the questionnaire

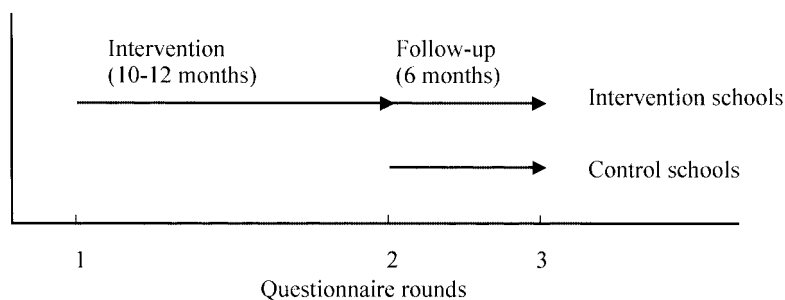
The questionnaire contained four sections, including general demographic information, knowledge, attitudes and intended behaviour. Nineteen of the questionnaire's 30 non-demographic questions were either taken directly from those recommended in the WHO/UNESCO resource package or they were slightly modified. The remaining 11 were designed by ourselves. In order to comply with standard Ministry of Education practice, all questions were written in simple English. (Written English and written Luganda—the vernacular in this area—are usually understood equally well by

Ugandan school pupils, even if the same cannot be said for the spoken word.) Respondents were asked to answer each question by ticking in one of a choice of boxes and they were also requested not to write their names on the answer sheets. Appendix 1 gives details of the questionnaire.

The questionnaire measured either directly or indirectly the four theoretical constructs identified by the BCI Model as the primary antecedents required for behavioural risk reduction (Figure 1). The knowledge questions directly measured knowledge acquisition, while the attitude questions directly measured attitude development. It would be very difficult, in this context and using this type of instrument, directly to measure skills development and motivational support. As the model shows, however, 'intention' is a product of all four primary antecedents, as well as self-efficacy and social environment manipulation. The two questions regarding intention to use a condom and intention to give an assertive response to an unwelcome request therefore indirectly measured all these other theoretical constructs.

The questionnaire was piloted in four schools from one of the other 12 IEC parishes and changes were made based on feedback from teachers. These mainly concerned words which some respondents could not understand (e.g. 'hugging' and 'donating'), which were simplified as far as possible.

Students in the intervention schools completed questionnaires directly before the programme



**Fig. 2.** Schematic chart showing timing between questionnaire rounds for intervention and control schools.

began (Round 1), immediately after it ended (Round 2, 10–12 months later) and again 6 months after that (Round 3) (Figure 2). The 6-month follow-up period permitted us to measure how well the material had been retained.

Logistical problems made it impossible for students in control schools to complete questionnaires at Round 1, so they did so only at Rounds 2 and 3, with the same 6-month gap as for the intervention schools. In recognition of their contribution, each control school received three ‘School Health Kits’ from UNICEF (on diarrhoeal diseases, sanitation and immunization) and a WHO health information package on common diseases in Africa.

Students in the top 2 years of the primary schools and the lower 2 years of the secondary schools were asked to complete questionnaires at baseline. These classes were then followed up in subsequent rounds of questionnaires.

It was not feasible for us to administer questionnaires in all the participating schools ourselves, so teachers acted as proctors while their students completed the forms. Since we recognized from the start that this could bring about improper questionnaire administration and therefore possible bias, we gave teachers during their training workshops clear and simple instructions, both verbal and written, on how to go about the process, as well as ample opportunity to discuss this both with us and among themselves. These instructions included practical details, as well as an explanation that the results would be pooled and assurances that no individual schools’ results would be made public. They were also told that if necessary

they could provide students with the vernacular translations of any words or phrases in the questionnaire. The importance of confidentiality throughout the process was stressed, even though there were no questions regarding respondents’ own sexual behaviour. We asked for specific details of how the process had gone at each school when we collected questionnaires and we found no cases from any of the participating schools where we had reason to believe that maladministration of the survey had occurred.

All students from eligible classes who were present on the given day were invited to complete a questionnaire. Students sat at their own desks while they answered the questions and they were asked to take the exercise as seriously as they would if they were sitting for an examination. Since many schools in rural Masaka suffer from limited resources, three or four students may sit at one desk. Some copying of answers would therefore unavoidably have occurred. However, we assume that the extent of this would have been similar in all the participating schools, so no bias should have been introduced to the dataset.

Contamination between intervention and control schools was unlikely on any but the smallest scale. Twenty-five of the 119 parishes in Masaka district were eligible for the larger trial and this study uses data from only seven. These seven parishes were randomly selected and none of them are direct neighbours. Of course, movement between parishes occurs, but since the intervention was geographically specific, students in the control parishes would rarely if ever see any of the programme materials.

Furthermore, of the eight or so other organizations working directly or indirectly with AIDS in the district, none provide IEC targeted specifically for young people. It is most unlikely, therefore, that some people in some parts of the district would have been exposed to materials—other than those distributed as part of our schools programme—while others elsewhere would not.

### Questionnaire analysis

The questionnaire data were coded, double-entered onto computer, validated and cleaned. Statistical analysis was undertaken using EPI INFO 5 (Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, GA) and STATA 4 (Stata Corp., College Station, TX). Two-tailed *t*-tests were applied at 5% level of statistical significance.

Overall mean scores for knowledge and attitude variables were derived for each respondent by adding up their number of correct or 'preferred' answers and dividing that by 13 or 15, respectively, i.e. the total number of questions in each section (see Appendix 1). Scores for different sub-categories of question were also calculated, by taking the number of questions in the given sub-category that were correctly answered and dividing by the total number of questions on the topic (e.g. there were three questions on knowledge about transmission of HIV and four questions on attitudes towards condoms). A score for the question related to intention to use condoms was calculated as the proportion of respondents who answered 'Yes'. Assertiveness was measured as the proportion of respondents who ticked the box indicating that they would give an assertive response to an unwelcome request.

Since the programme was run at school level, the schools themselves and not individual students were taken as the units of analysis. Scores from respondents were therefore pooled to provide overall scores for each variable for each school at each round of the questionnaire survey. Baseline data from the top primary class (Primary 7) from both intervention and control arms were excluded from these calculations, since most students in this class

in the intervention schools could not be followed up after the end of the 1997 school year.

Estimated annual rates of change for all variables were derived for the intervention group for the periods between Rounds 1 and 2 (to determine the effect of the intervention itself), Rounds 2 and 3 (to assess changes during the immediate post-intervention period), and Rounds 1 and 3 (to evaluate the combined impact of the intervention and the follow-up period). Annual rates were also calculated for the control group (from which data were collected at Rounds 2 and 3). These rates were based on the assumption that the observed increases per unit time between rounds were constant. Linear regressions were then calculated in order to compare the rates of change between the two groups at different stages of the study. The dataset had 90% power at 5% level of statistical significance to detect a 13% difference in annual rates of change.

### FGDs

A series of twelve FGDs (six with girls and six with boys) was held at five randomly selected intervention schools (two secondary and three primary—one from each of the same five parishes as those in which the questionnaire survey was conducted) directly after the programme had ended in their respective parishes. Potential participants were identified by their respective head teachers on the basis of their likely interest to take part as well as their capacity to speak in a group. We attempted to recruit a similar proportion of boys and girls. All participants were asked to indicate their consent to take part by giving some brief demographic details and signing a form. None refused.

The FGDs were facilitated by a trained and experienced interviewer, and were conducted in the vernacular, Luganda, with boys and girls in separate groups. They sought to obtain participating students' views about some of the key activities and about the programme in general, using a standardized set of questions. In addition to questions about students' views on the programme and HIV/AIDS and sex education in general, groups

**Table II.** Characteristics of pupils at baseline, by school groups

	Intervention schools ( <i>n</i> = 20)	Control schools ( <i>n</i> = 11)	<i>P</i> value
Total no. of respondents	1274	803	–
Respondents per school [mean (range)]	63.7 (14–255)	80.3 (12–167)	–
Sex (%)			
male	47	40	
female	53	60	0.20
Mean age [years (SD)]	14.3 (0.9)	14.5 (1.0)	0.65
Age range	10–24	10–25	–
Religion (%)			
Roman Catholic	53	53	
non-Roman Catholic	47	47	0.93

were shown a selection of the student activity sheets and asked whether they had ever seen them, whether they had been taught them and, if so, what they thought about them.

The FGDs were taped, transcribed verbatim and translated into English for analysis. This triangulation exercise provided an external validity and reliability check on the questionnaire data.

## Results

### Questionnaire data

All the head teachers we approached in relation to the questionnaire survey agreed to take part. The demographic characteristics of the intervention and control schools at baseline are summarized in Table II. There were no significant differences between the intervention and control groups with respect to sex, age or religion, so calculations comparing the two groups were not adjusted for these potential confounders. Further details of the baseline findings in the intervention schools will be presented elsewhere (Kinsman *et al.*, 2001).

A total of 1274 eligible respondents provided questionnaire data that were used in the intervention group's baseline analysis, while 803 did so for the control group. The two group's baseline scores were very similar, with scores for overall knowledge, overall attitude, intended condom use and intended assertive behaviour differing between the two groups by a mean of only 1.6% (Table III).

This makes longitudinal comparisons permissible.

While increases in the intervention group's scores were noted for all nine key variables between Rounds 1 and 2 as well as between Rounds 2 and 3, the annual rate of increase was greater in seven cases for the former period than it was for the latter (Table III).

The control group demonstrated increases in annual rates for seven of the nine key variables, while unexplained decreases in score were noted for the other two variables (Table III). The group's attitude score towards delaying sex fell by 15.8%, while that for intention to be assertive dropped 18.8%. Significant differences between the intervention and control groups were demonstrated with these two variables ( $P = 0.004$  and  $P = 0.001$ , respectively).

In four of the seven cases where both intervention (Rounds 1–3) and control groups demonstrated increases, the rate of increase was greater in the intervention group, while in three cases, it was greater in the control group (Table III). The annual rate of increase with these seven variables ranged from 8.0 to 11.2% in the intervention group and from 2.5 to 15.5% in the control group. There were no statistically significant differences in the rates at which scores increased for any of these variables between controls and any of the three intervention periods.

To summarize, the quantitative data suggest that the programme's overall effect was minimal and not statistically significant.



**Table III.** Baseline scores for key variables in intervention and control schools, estimated annual mean score increases during given periods, and the overall differences between intervention and control schools

	Mean baseline score		Estimated annual change				Difference in estimated annual change (intervention, Rounds 1-3 – control)		P value
			Intervention schools		Control schools		Actual		
	Intervention schools (n = 20)	Control schools (n = 11)	Intervention schools (Rounds 1-2)	Intervention schools (Rounds 2-3)	Intervention schools (Rounds 1-3)	Control schools (Rounds 2-3)	Weighted <sup>a</sup>		
Overall knowledge (%)	58.1	59.2	8.7	8.9	8.6	4.4	4.2	4.1	0.30
knowledge about condoms (%)	63.7	72.3	7.5	17.8	11.2	3.2	8.0	6.6	0.20
knowledge about HIV transmission (%)	61.7	59.7	10.9	3.7	8.0	9.5	-1.5	-2.1	0.68
Overall attitude (%)	47.7	48.0	10.2	5.4	8.0	1.6	6.4	6.8	0.10
attitude to delaying sex (%)	72.2	77.3	10.0	4.4	7.7	-15.8	23.5	22.0	0.004 <sup>b</sup>
attitude to condoms (%)	48.5	49.1	8.9	8.3	8.5	2.5	6.0	6.9	0.14
discrimination towards people with AIDS (%)	33.9	27.2	12.1	6.1	9.5	15.5	-6.0	-5.7	0.23
Intended behaviour									
'would you use a condom to play sex if you had one with you?' (% saying 'yes')	57.8	55.5	11.3	8.8	10.0	13.0	-3.0	-3.3	0.70
percent saying they would give an assertive response to an unwelcome request	71.9	74.7	8.6	2.4	6.0	-18.8	24.8	26.0	0.001 <sup>b</sup>

<sup>a</sup>Weighted differences take into account the inverse of the standard deviation of each mean contributing to the calculation and are used to determine the P value.

<sup>b</sup>Significant.

## FGDs

Forty-seven girls (mean age = 14.3 years, range = 10–17 years) and 46 boys (mean age = 15.4, range = 12–20 years) from five schools took part in the 12 FGDs. The initial intention of the FGDs was to obtain some of the participating students' views about the programme. However, it quickly became apparent that they had never seen most of the student activity sheets and therefore that the intervention had not been implemented in the classroom as fully as we had hoped or expected.

Teachers had been asked to fit the programme into their timetables as they saw fit, but the general picture obtained from students was of an irregular and generally unscheduled process. When taught, lessons tended to be fitted in on an *ad hoc* basis, e.g. if a free period arose and the teacher had time. The students complained that this created an unsatisfactory learning environment and they regretted the fact that they had not learned all they would have liked. Those who said they *had* learned something did not speak of any great illumination coming out of the programme.

The thing is that when we get time for the programme, the teacher will say he has no time. When you attend, it is in a rush because you are running against time. If someone has not understood, no one is bothered. [Girl]

The teacher was rushing through the lesson. [Girl]

On top of that, we were very hungry. [Girl]  
That day had been very hot. Most of the boys were shouting. [Girl]

I learned little. I say so because I do not have a single idea about some of the things that you have been asking us about. If they had taught us all those things you were asking us about, it would be better. [Boy]

I received a little. The part I did not know was that AIDS cannot get you by sharing clothes with a person who has it. That was the biggest thing I have learned so far. [Boy]

The *ad hoc* nature of the implementation process

was perhaps best exemplified by what happened at one school, where the programme consisted of one long session managed by one teacher, at which the entire 180-strong student body was present.

While the programme as a whole was under-implemented, two key sections in particular appear to have been almost completely ignored. Condoms were touched upon by some teachers, but none of the students from the five schools participating in the FGDs had seen the programme's condom activity sheet and none had done any role-play exercises. This corroborates what was reported elsewhere (Kinsman *et al.*, 1999), that teachers were reluctant to tackle these controversial and unfamiliar topics.

We did not have a lesson on condoms. The teachers just mentioned condoms a few times. [Girl]

Were you taught about condoms in the programme? [Facilitator]

No. They were going to tell us but there was no time. [Girl]

What class did she give the role-play to? [Facilitator]

It was only two people. They were supposed to prepare it and then act it before the class. There was a girl who was in school and a big man. The man wanted to give the girl a lift in his car, but the girl refused. She told the man off. She [the teacher] gave it to them to practice, but they were not able to act it by the time the term ended. [Girl]

This lack of comprehensive coverage, especially of the condom, was regretted by many of the students. They expressed a strong interest in the topic and they very much wanted to know more, specifically about how to use them.

It would be good if we learn how to use them because you might come across a guy and approve 100%. You've got nothing else to do but to have sex. However, he may never have attended school and can't even read. Yet the girl knows about using condoms. You can help him. [Girl]

We should be taught about condoms because we are not in a position of saying that this person is infected and this one is not. And then our hormones can react positively to a girl who we are just seeing, but she is infected with HIV. And then you can be forced to fall in love with that girl and then have sex. And then if we are not taught about how to use the condoms, we can be affected. But when we are taught, we can use those condoms, and we can play sex which is protective. [Boy]

Sincerely speaking, we need to be taught about condoms because we are at the age of adolescence. The future which we are going into is very dangerous. In future you will want to do it, and yet not know how to use a condom. Probably there are some people here right now who want to do it, but they don't know how to use the condom. [Boy]

When asked how they thought the programme could be improved, the students appeared to recognize the difficulties in scheduling and they suggested that including the programme more formally in the curriculum would encourage implementation. Testing the subject was also proposed as a means to ensure that teachers cover it and that students learn.

They should put aside some time on the school time table for teaching this thing. It would then be treated as a lesson like the other ones. [Girl]

You could fix the activity on the timetable, whereby we can have enough time. [Boy]

I think it would be better if these lessons were introduced like a serious thing. Most people don't take them seriously because we don't have any test or anything. If you don't do the homework, you will not be punished. So there is no reason for people to pay attention. [Girl]

There were also suggestions, albeit not universally accepted, that a peer education approach might benefit students more than a traditional teacher-based approach.

I think peer education would be better. Teachers do not stay near the school. Take an example of Mr M. He comes from [village] K. Most of us stay in B. Now, what if you train a guy like J over there. He is always with us at school. Whenever we get problems, we can go to him very easily. If you train him very well, after he has taught us, we can always ask him about problems we meet along the way. I could spare some time during the weekend to go and see him. However, none of us can go to Mr M's place because we don't even know where he lives. Even if you knew where he lives, it would not be that easy to go there. [Boy]

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## Discussion

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This paper describes a controlled and triangulated evaluation of a comprehensive school-based AIDS education programme, adapted from WHO/UNESCO's *School Health Education to prevent AIDS and STD—A Resource Package for Curriculum Planners* (WHO/UNESCO, 1994) and implemented in 66 schools throughout rural Masaka district, southwestern Uganda. Quantitative and qualitative data from students were used during the evaluation, which complements information obtained from the implementing teachers, as reported elsewhere (Kinsman *et al.*, 1999). To our knowledge, this package has not previously been evaluated.

We faced a few methodological problems in the evaluation, primarily with the questionnaire survey. For example, we were unable to collect questionnaire data from the control group at baseline, so the intervention and control groups' datasets were not directly comparable. However, we assumed that rates of change between questionnaire rounds for the nine key variables were linear, which we believe permits meaningful comparisons of the intervention and control groups to be made on the basis of the data that we did obtain. In addition, the fact that we did not measure the control schools at baseline means that we reduced testing effect among this group.

Validity could perhaps have been compromised by the fact that the questionnaire was in English. More advanced students may have given more valid responses due to their better comprehension, but since teachers were asked to give vernacular translations for those students who failed to understand certain words or phrases, we believe this problem would have been reduced to a minimum. Furthermore, understanding of simple written English by Ugandan school pupils is, in most cases, just as good as their understanding of written Luganda, the vernacular. Ours was not the first evaluation of a Ugandan school-based AIDS education programme to use an English language questionnaire. Shuey *et al.* (Shuey *et al.*, 1999) did the same and they also reported valid results.

Ascertaining the reliability of a questionnaire which investigates knowledge is inherently problematic, since repeating the exercise—which is the best way to determine reliability—allows respondents to ‘learn’ the instrument. We therefore chose not to test reliability formally, relying instead on the qualitative data to support the quantitative data—and vice versa—through triangulation. Since the quantitative data are fully consistent with the qualitative data and these in turn are compatible with the feedback we received from the participating teachers (Kinsman *et al.*, 1999), we believe that in spite of the acknowledged difficulties described above, this triangulation process has validated our overall findings.

Taking these three data sources in turn, the questionnaire analysis can be summarized as follows. Annual rates of change were estimated for nine key variables, both for the intervention and control groups. For the intervention group, rates were calculated for the intervention period itself and for a 6-month follow-up period. However, significant differences between the annual rates for the intervention and control groups were found for only two of the nine variables (both during the intervention period) and both of these cases were the result of an unexplained *decrease* in the control group’s score rather than a large *increase* in the intervention group’s score.

The same pattern was found when comparing

the overall intervention group annual rates (which include the intervention itself as well as the 6-month follow-up period) to those from the control schools. Six of the nine variables showed greater increases in the intervention group, but of these only two were significant—the same two as above and for the same reason. In other words, even when the intervention group’s score increases were greater than the control group’s, the differences that could be attributed to the intervention were relatively insubstantial. The quantitative data suggest, therefore, that the programme’s effect was, at best, minimal.

These results are consistent with the qualitative data obtained during the FGDs with participating students, which were conducted after the intervention had ended. These indicated that the students had not learnt very much from the programme, even though they were clearly thirsty for knowledge about how to protect themselves from HIV infection. The reason given consistently by the students was that they had simply not been taught the programme properly. They had previously seen only a very few of the student activity sheets that were shown them during the FGDs and they complained especially that they had not learned anything substantial about condoms. Based on this evidence, it is fair to suggest that while some of the 66 schools may have implemented the programme very well—a claim that would be supported by our informal observations—the majority did not.

These findings are in turn consistent with what has been previously reported (Kinsman *et al.*, 1999). Teachers said they lacked sufficient classroom time to implement the package on account of curriculum overload, a problem which has caused the failure of extracurricular health promotion campaigns in schools elsewhere (Reid, 1999). They were also reluctant to discuss details of condom use for fear of antagonizing parents, the wider community or head teachers. Furthermore, their unfamiliarity with role-play, in combination with their preference for a didactic teaching approach led them to avoid this important activity.

Students themselves recognized that incorporat-

ing the programme formally into the curriculum would not only ensure that there would be time for it to be properly run, but it would also greatly improve motivation from both teachers and students, especially if it was to be comprehensively examined. The addition of a complementary peer education component, as suggested by some students, may further enhance the acceptability of such a school-based programme to the recipients and provide them with more accessible sources of sensitive information than teachers can supply.

All the other controlled evaluations of which we are aware that have examined AIDS education programmes for schools in sub-Saharan Africa have achieved positive results (Klepp *et al.*, 1994, 1997; Fawole *et al.*, 1999; Fitzgerald *et al.*, 1999; Shuey *et al.*, 1999; Harvey *et al.*, 2000). We believe ours is the first in the literature to demonstrate no effect. Why did ours fail where the others succeeded? We did everything we practically could to facilitate implementation of the programme, both through training and supervision, and through provision of all the required materials. However, we felt it would be inappropriate for us to dictate exactly when and how individual schools should carry the intervention into the classroom, preferring instead to offer suggestions as to how they might make their own arrangements. It seems that this is where the process faltered. Nonetheless, even with the benefit of hindsight, we could not with the manpower available to us realistically have assisted each of the 66 schools to design their own individual timetable for implementation. This problem was primarily one of scale and, in that sense, the lessons learned from our study would be applicable to many other large, or even national, AIDS education programmes for schools in sub-Saharan Africa.

Essentially, unless teachers are somehow obliged to cover the subject, similar programmes may fail simply due to incomplete implementation, even if they are theoretically and sociologically sound. As mentioned above, Uganda has begun to work towards requiring teachers to inform their students about AIDS by including the topic in the LSEI, a wide-ranging life skills programme which is

gradually being incorporated into the national curriculum. Other countries in the region are making similar efforts. However, the success of such programmes is likely to depend largely on the extent to which teachers are given suitable training while in college as well as in-service support in the participatory teaching methods required by this sort of material. Furthermore, the subject would need to be properly time-tabled and examined, in order to motivate both students and teachers to take it seriously. In addition, since teachers may be reluctant to tackle the teaching of condoms in detail, other channels for covering this vital topic outside the school context, such as peer education, should be rigorously evaluated.

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### Acknowledgements

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The authors thank Susan Harrison for her work setting up the schools programme and for her assistance in questionnaire design; Justine Kiyangi for aiding in questionnaire distribution and collection; Stella Nyanzi for conducting, transcribing and translating the FGDs; Joseph Ssembatya, Elisam Mulali, Edward Kanyesigye and Ignatius Kamulegeya for coding; Doreen Bamanya and Aeron Namirembe for data entry; John Hubley for sharing his 'School Health Promotion in Developing Countries' literature review; and the teachers and students of all the schools who participated in this study. We also thank the three anonymous referees, whose insightful comments helped finalize the paper.

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Received on April 14, 1999; accepted on August 25, 2000

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## Appendix 1: The questionnaire used in the quantitative evaluation of the Masaka schools programme

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Knowledge questions	Correct response
(1) Most Sexually Transmitted Diseases (STDs) can be cured, but there is no cure for AIDS	<b>True</b>
(2) HIV is spread through semen (sperms), vaginal fluids and blood (T)	<b>True</b>
(3) Playing sex with a person under the age of 18 years (defilement) is against the law in Uganda	<b>True</b>
(4) You can get HIV by shaking hands with a person who has HIV or AIDS (T)	<b>False</b>
(5) Condoms can protect people from HIV if they are used correctly every time they play sex (C)	<b>True</b>
(6) A good reason for young people to avoid sex is so that they do not catch HIV or an STD	<b>True</b>
(7) The more sexual partners a person has, the greater their chance of getting HIV	<b>True</b>
(8) There is no danger of getting HIV if you eat food prepared by someone with HIV or AIDS (T)	<b>True</b>
(9) The same condom can be safely used two times (C)	<b>False</b>
(10) <i>Straight Talk</i> is a magazine for young people about safe sex	<b>True</b>
(11) People who choose only healthy looking partners won't get HIV	<b>False</b>
(12) A person can get HIV by giving (donating) blood (T)	<b>False</b>
(13) You can always tell if a person has HIV by the way they look	<b>False</b>
<b>Attitude questions</b>	<b>Preferred response</b>
(1) It is alright to play sex while still at school ( <b>DEL</b> )	<b>Disagree</b>
(2) It is a good idea for school pupils to delay playing sex until they are older or married ( <b>DEL</b> )	<b>Agree</b>
(3) If my boy or girlfriend wanted me to play sex it would be better to agree than to lose him or her	<b>Disagree</b>
(4) Young people who play sex should realize that if they do not use a condom each time then they could get HIV or an STD (C)	<b>Agree</b>
(5) It is alright to play sex without a condom because the chance of getting HIV is very small (C)	<b>Disagree</b>
(6) It is not a good idea for school pupils to go alone to 'night parties'	<b>Agree</b>
(7) It is alright to say 'no' to friends when they want me to do things I do not want to do	<b>Agree</b>
(8) I think it is alright to accept gifts from people I do not know well	<b>Disagree</b>
(9) People who have AIDS should be forced to live far away from other people ( <b>DISC</b> )	<b>Disagree</b>
(10) If a girl says 'no' to sex, she may in fact mean 'yes'	<b>Disagree</b>
(11) I would feel shy talking about condoms with my boy or girlfriend (C)	<b>Disagree</b>
(12) I would be happy to shake hands with a friend who has AIDS ( <b>DISC</b> )	<b>Agree</b>
(13) I would feel safe if I were caring for a close relative with HIV or AIDS	<b>Agree</b>
(14) I would feel shy buying a condom (C)	<b>Disagree</b>
(15) I would be happy to be in the same classroom with someone who has AIDS ( <b>DISC</b> )	<b>Agree</b>
<b>Intended behaviour</b>	<b>Preferred response</b>
(1) Would you use a condom to play sex if you had one with you?	<b>Yes</b>
(2) If one of your friends wanted you to join them in doing something that you did not enjoy, what would you do? Would you (a) agree and go along anyway, (b) say that you are not interested and refuse or (c) get angry with your friend?	<b>(b)</b>

Knowledge and attitude questions ranked by the overall proportion of correct/preferred answers given. (T) = questions related to HIV transmission; (C) = questions related to condoms; (DEL) = questions related to delaying sex; (DISC) = questions related to discrimination towards people with AIDS.