

## **Some factors in the decline of AIDS in Uganda**

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### **Abstract**

**The fight against AIDS in sub-Saharan Africa is in its second decade and has not been won because of the region's low levels of social and economic development. Since no vaccine or cure for AIDS seems likely in the near future, change in sexual behaviour remains the only control mechanism. Studies of six districts of Uganda conducted between 1992 and 1995 investigated the situation and found that despite the lack of a cure, the epidemic is steadily declining in Uganda. The observed decline is due to a combination of factors including AIDS awareness and fear, favourable change in sexual behaviour and marriage patterns and positive attitudes towards HIV testing. More intensive AIDS awareness programs should be conducted to sustain the observed trend.**

The spread of AIDS is no different from that of other epidemics known to have occurred in the past. The smallpox epidemic of 1520 in Mexico (McCaa 1994), the epidemics of yellow fever and dengue of the 1800s in Latin America and the Caribbean (Lifson 1996), the gonorrhoea-syphilis epidemic of the eighteenth century in France and the neurosyphilis epidemic in Europe and North America (Shorter 1992) were also devastating. These epidemics had similar patterns of occurrence, with subsequent periods of outbreak and spread, peaking and finally declining, some with episodes of recurrence.

The French epidemics, especially the epidemic of neurosyphilis, which is a useful model for the AIDS epidemic, occurred in the context of increased human mobility to urban areas (Shorter 1992). Men were infected through sexual relations with prostitutes in towns and passed the infection on to their wives in villages. As the disease became widespread, there were scandals and shame in communities. This prompted the communities to adjust their sexual behaviour and with medical intervention the spread of the epidemic was reduced.

The worldwide AIDS epidemic is a recent phenomenon. In most countries, the outbreak did not occur until the 1980s. At the present time, there is no country in the world without HIV cases (WHO 1995). In the United States, AIDS was recognized as early as 1981 (Ward, Hardy and Drotman 1987) and by the mid-1980s, AIDS was the leading cause of death among women in New York aged 24-34 years (Wofsy 1987).

The earliest documented incidence of AIDS in sub-Saharan Africa appears to have been at around the same time as in the US and Europe (Biggar and Agius 1987). In Uganda, the first HIV case was identified in Rakai district in 1982 (Sabatier, Foreman and Tinker 1989). In a short time, the virus spread widely and severely affected Uganda (Konde-Lule 1995). In Ghana, AIDS cases were first identified in 1986, three years after the first HIV cases were isolated in Kenya (Anarfi and Antwi 1993).

Studies in Africa have shown higher HIV prevalence rates in urban than in rural areas. The rates were more than 10 per cent of the adult population in major cities of Africa and between 5 and 9.8 per cent in the rural areas of Uganda, Botswana and Rwanda (Weis *et al.* 1994; Allen *et al.* 1991). Furthermore, variations in HIV prevalence were noted among the at-risk groups and the general population of the urban areas. The rates were more than 50 per

cent in the high-risk groups of Tanzania (Nkya *et al.* 1991) and over 2 per cent in Malawi for the general population (Maher and Hoffman 1995). In Uganda, the rate in 1992 was 29.5 per cent in the urban general population (Asiimwe *et al.* 1992) and 45 per cent in high-risk groups such as STD patients in Kampala (Grant *et al.* 1992). However, recent reports from the STD/AIDS unit of the Ministry of Health reveal that the high rates have moved to the rural areas in Uganda (STD/AIDS Control Programme 1996).

Fortunately, for the 1990s the reports so far received in Uganda about HIV/AIDS prevalence are encouraging. For instance, the Mulago hospital's prenatal clinic data revealed a reduction in HIV seroprevalence among women attending the clinic from 28.1 per cent in 1989 to 16.2 per cent in 1993 (Bagenda *et al.* 1995). In addition, official reports of the Ministry of Health for the period 1991-1995 indicated further declines in HIV infection (STD/AIDS Control Programme 1996). Infection among pregnant women in six hospitals showed that the median rates dropped from 24.7 per cent in 1992 to 13.6 per cent in 1996.

In sub-Saharan Africa, HIV is spread by heterosexual transmission (Mulder *et al.* 1994 ; National Research Council 1996). Studies by Killewo *et al.* (1990), Neequaye, Neequaye and Biggar (1991), and Serwadda *et al.* (1992) identified sexual intercourse with prostitutes, history of sexually transmitted diseases, multiple sexual partners and traditional practices as risk factors in adults. Therefore, the decline in HIV prevalence was attributed to behaviour change and the impact of the various intervention measures (Konde-Lule 1995; Bagenda *et al.* 1995; Serwadda, Wawer and Sewankambo 1995). Livingston (1992) asserted that good knowledge of AIDS transmission, symptoms and prevention could retard the rate of infection and thus lessen the spread of the epidemic, considering that an immediate cure or vaccine is not foreseeable. Frequent exposure of the community to AIDS patients and appreciation of the suffering of the patients and their families may initiate a change in behaviour (Konde-Lule and Sebina 1994). However, because of promiscuity and lack of control among the people, good knowledge may not necessarily induce behavioural change (Anderson *et al.* 1990; Muller *et al.* 1992; Bagarukayo *et al.* 1993).

The October 1996 report of the Ministry of Health indicates that Ugandans have significantly changed their sexual behaviour to avoid infection (STD/AIDS Control Programme 1996). Similarly, Owuamanam (1995) confirmed that more than 70 per cent of the youth in South Western Nigeria have modified their sexual behaviour since learning about AIDS. He found that in reaction to the epidemic, young people had reduced the number of sexual partners and relationships, had used condoms and even in some cases abstained from sex.

Many AIDS-related studies in Uganda and elsewhere associate the recent decline in the epidemic with socio-demographic, cultural, and biological factors (Mulder *et al.* 1995). Other suggested factors in the decline have been specific interventions, including behavioural change in sexual patterns; attitudes towards condoms; abstinence; fear of death; serial marriage; counselling; and control of sexually transmitted diseases. However, these are just suggestions which need empirical testing since no single study has been made to confirm them.

This paper uses data from recent qualitative and quantitative studies in Uganda to trace the trend of HIV infection and AIDS mortality in the population during the period and to evaluate some of the factors responsible for the epidemic's decline in Uganda. Data on morbidity and mortality are used to assess trends in HIV and AIDS; the factors responsible for the epidemic's decline during the study period are analysed from information on migration, behavioural patterns, illness and death in the community in the baseline survey of 1992/93 and the follow-up study of 1995.

### **Source of data**

The data used here are from a multi-phase study entitled 'Evolution of household composition and family structure under conditions of high mortality in Uganda' started in 1992. The study was conducted in six districts: Mbale and Iganga in the east, Masaka in the south, Mbarara and Kabale in the southwest and Hoima in the west. These six districts represent the major ethnic groups of Bagisu, Basoga, Baganda, Banyankore, Bakiga and Banyoro respectively. The primary sampling unit was a local council, the equivalent of a village, from which households that had experienced mortality in the ten years before the study were chosen and examined. The head of the household was the respondent, if present, otherwise a responsible person in the household gave the information.

The study was carried out in three phases, the first being a review of ethnographic material on the people of the six districts. In this phase, information was collected from elders and youth through focus-group discussions and an elders' questionnaire. The second phase was a baseline household survey in the same districts, conducted between 1992 and 1993, to document recent changes in family structure and household composition; this covered a total of 1797 households. A follow-up survey was conducted in 1995 in the same households to monitor the changes that took place during the inter-survey period. Some additional households which had experienced death in the recent period were added to the original households. This increased the sample to 2352 households.

Phases 2 and 3 used a structured questionnaire with eight sections which sought information about characteristics of the household members, contribution of members to the welfare of their household, mortality since the household was formed, orphanhood and caretaking arrangements, migration and behavioural patterns of widows and widowers, current patient care in the household, attitudes in the community towards illness and death, and degree of fertility.

### **Trends in the HIV/AIDS epidemic in Uganda**

#### *Evidence from other studies*

Recent evidence indicates that HIV and AIDS prevalence in Uganda has declined since 1992 (Konde-Lule 1995). Table 1 is based on data by the Medical Research Council Programme on AIDS in Masaka, and shows a decline in deaths among female AIDS patients in the period 1989-94.

Mulder *et al.* (1995) reported a declining HIV prevalence among both sexes aged 13-24 years in Masaka since 1992. This is shown in Table 2, which also shows a greater decline among males than females. Also noted was a decline in the HIV/AIDS epidemic in the entire population.

**Table 1**  
**Percentage by sex of persons who died of AIDS in each round of survey in Kyamulibwa sub-county, Masaka (1989-94)**

	Round 1	Round 2	Round 3	Round 4	Average
<b>Sex</b>					
Males	26.3 (15/57)	30.0 (21/70)	33.0 (38/115)	33.3 (21/63)	31.1 (95/305)
Females	39.4 (26/66)	34.1 (31/91)	28.1 (32/114)	28.3 (21/74)	31.9 (110/345)
Both sexes	33.3 (41/123)	32.3 (52/161)	30.6 (70/229)	30.7 (42/137)	31.5 (205/650)

Source: MRPA program data.

**Table 2**  
**HIV seroprevalence rates by sex among persons aged 13-24 in Masaka, Uganda 1989-94**

Variable	1989/90 Round 1	1991 Round 2	1992 Round 3	1993 Round 4	1994 Round 5
<b>Sex</b>					
Males	3.4 (29/846)	3.6 (26/716)	2.3 (15/657)	1.6 (10/637)	1.0 (7/688)
Females	9.9 (87/883)	8.2 (68/833)	7.8 (61/778)	8.1 (56/691)	7.3 (54/742)
Both sexes	6.7 (116/1729)	6.1 (94/1549)	5.3 (76/1435)	5.0 (66/1328)	4.3 (61/1430)
Population <sup>a</sup>	8.2 (243/4172)	7.8 (286/3662)	7.8 (276/3425)	8.1 (269/3193)	7.6 (271/3342)

Source: Mulder *et al.* (1995:87) <sup>a</sup> Includes other age-groups.

Related studies by the STD/AIDS Control Programme of the Ministry of Health show the same trend in HIV infection among the women attending antenatal clinics at sentinel surveillance sites in Uganda. Table 3 shows that there has been a decline in HIV infection at six sites in east, central and southwestern parts of Uganda since 1992. Although the rate of infection has increased by 0.6 per cent in Jinja and 1.6 per cent in Mbale hospitals in the period 1995-96, these rates are lower than the 1994 figures of 16.3 and 10.2 per cent.

There is hope now that the epidemic, especially HIV infection in Uganda, is declining although the levels are still high. Knowledge of the reasons for this decline is important in the campaign against the disease and to help policy-makers find solutions to the problem. A reduction in HIV infection would bring a significant drop in AIDS-related mortality and thus reduce the epidemic further.

**Table 3**  
**HIV infection rates in sentinel sites, Uganda 1991-96**

Site	1991	1992	1993	1994	1995	1996
Nsambya	27.3	29.5	30.1	21.8	16.8	14.5
Rubaga	27.3	29.4	24.4	16.5	20.2	15.1
Mbarara	24.3	30.2	18.1	17.3	16.6	13.2
Jinja	22.0	19.9	21.8	16.3	13.2	14.0
Tororo	12.8	13.2	10.4	10.2	12.5	10.1
Mbale	12.0	14.8	9.5	10.2	7.8	9.1
Median	23.2	24.7	20.0	16.6	15.0	13.6

Source: STD/AIDS Control Programme reports 1991, 1995, 1996.

***Evidence from this study***

Percentages of respondents who were reported sick or dead of AIDS are tabulated according to age, sex and district in Table 4. The table shows low rates of AIDS sickness and death in 1992, illustrating recent outbreaks of the epidemic in some of the communities. The low rates can also be attributed to a few cases observed in the survey of 1992.

**Table 4**  
**Percentages of the dead and sick from AIDS by district, sex and age (1992/93-95)**

Variable	Dead			Sick		
	1992 n=436	1992/93 n=1505	1995 n=3980	1992 n=141	1992/93 n=2136	1995 n=1315
<b>District</b>						
Mbale	38.9	52.3	43.7	14.7	47.5	23.2
Ignana	25.5	36.2	42.3	6.3	43.7	27.2
Masaka	71.1	69.2	51.5	36.4	49.5	26.4
Mbarara	22.0	24.7	42.6	23.5	23.5	21.0
Kabale	48.0	41.2	50.0	31.6	46.9	17.6
Hoima	29.6	29.6	38.0	25.0	25.7	23.9
P-value	0.0000	0.0000	0.02	>0.05	0.0000	0.02
<b>Sex</b>						
Males	39.5	43.2	40.7	27.4	43.4	22.4
Females	43.4	49.8	49.3	20.8	36.9	23.7
P-value	>0.05	0.00003	0.0008	>0.05	0.02	>0.05
<b>Age</b>						
12 and under	19.4	27.8	23.2	31.0	41.3	20.6
13-24	53.0	56.5	54.5	22.7	41.0	30.6
25-39	62.0	67.1	58.6	26.9	52.0	29.2
40+	29.6	34.9	39.6	19.4	30.6	21.3
P-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003
Total	41.4	46.1	45.0	23.7	39.9	23.1

Table 4 also shows an increasing trend of AIDS mortality in four out of the six districts from 1992 to 1995. The exceptions are Masaka which shows a consistent declining trend, and Mbale, which initially showed a rise then a decrease after 1992. The distinct pattern observed in Masaka reflects an earlier AIDS epidemic which has probably reached its peak. The table also shows that areas of high AIDS mortality like Masaka and Mbale have fairly high prevalence rates with significant decline in the AIDS epidemic. This was also noted by Konde-Lule (1995) and Serwadda *et al.* (1995) in Masaka and Rakai community studies.

In Table 4, HIV infection and prevalence are indicated by the percentage of patients sick with AIDS. For all the districts there has been a general downward trend in HIV infection with marked decline in Kabale, Mbale and Masaka, where AIDS mortality rates are already very high. People in these communities have suffered much because of AIDS, and the pain of losing their friends and relatives to the disease has been reflected by positive changes in behaviour.

Table 4 further shows AIDS morbidity and mortality by sex. For both sexes, HIV infection has declined. However, the table also reveals that more females than males had been infected and died of AIDS. Whereas AIDS mortality of males declined, that of the females remained fairly constant. The female focus-group discussions held in urban Iganga attributed this pattern to the poverty of women which made them less resistant to richer men's sexual advances.

The table also shows that there was a decline in the HIV/AIDS epidemic after 1992 in all age groups except in persons aged 40 and above. The increase in AIDS mortality among these persons can be explained by the long incubation period of HIV. The decline was only statistically significant in persons aged 13-24 and in the overall rate, as has been found in other HIV/AIDS studies carried out in Uganda by Bagenda *et al.* (1995), Kengeya-Kayondo *et al.* (1995) and Serwadda *et al.* (1995).

A close observation of the overall HIV/AIDS situation in the study area shows a general downward trend of infection in the population with a sharp decline among the sick and a fairly constant death rate. In addition, the table shows that AIDS mortality exceeds HIV incidence in each follow-up year and influences the observed decline of HIV prevalence. However, there has been a real decline in the epidemic in the study area. What is needed is knowledge of the reasons for the decline so that appropriate measures can be taken to sustain the trend.

### **Factors in HIV/AIDS epidemic decline**

This section explores factors that could be responsible for the downward trend in HIV and AIDS prevalence. Konde-Lule (1995) explains the decline in terms of a very high HIV-related mortality which has instilled fear of death among the people. Other factors are that many young persons who are HIV-negative are becoming adults and there has been a much higher HIV incidence in the last decade. Other researchers have proposed behavioural change in practices and attitudes as the single major contributor to the decline in the epidemic (Bagenda *et al.* 1995; Boroffice 1995; Kengeya-Kayondo *et al.* 1995; Kishindo 1995).

The effect of changes in age on the epidemic is investigated using the age cohorts of 10-12, 13-24 and 25-39 years. This is because reports of focus-group discussions held in various parts of Uganda singled out the youth as the most vulnerable to AIDS. In addition, children aged 10-12 years are known to be mostly HIV-negative but three years later they are in the 13-15 age group which is at a high risk of HIV. Konde-Lule (1995) claims that with time, these children move into the adult category while they are HIV-negative and pull down the general HIV prevalence rates.

Percentages of persons dead and sick with AIDS in the baseline survey 1992/93 are

compared with those in the follow-up survey of 1995 in Table 5. The table indicates that while the percentages of deaths from AIDS were 22.0 for the 10-12 age group, 56.6 for those 13-24 and 67.1 for those 25-39 in 1992/93, the percentages dropped to 7.7, 54.5 and 58.6 in 1995. The corresponding percentages of people sick with AIDS in 1992/93 were 38.7, 41.0 and 52.0, which fell to 32.3, 30.6 and 29.2 in 1995.

**Table 5**  
**Percentage effect of age cohort on AIDS morbidity and mortality (1992/93-95)**

AIDS/ Age group	n	1992/93			n	1995		
		10-12	13-24	25-39		10-12	13-24	25-39
Dead	1893	22.0	56.6	67.1	783	7.7	54.5	58.6
Sick	535	38.7	41.0	52.0	642	32.3	30.6	29.2
Age group						13-15	16-27	28-42
Dead						25.0	58.5	58.5
Sick						32.4	31.8	26.1

It is evident from Table 5 that prevalence of HIV and AIDS declined between 1992 and 1995 within the same age groups and in the same cohorts. This may be due to large-scale education campaigns in the early 1990s which familiarized people with the dangers of risky behaviour. The decline also occurred in older age groups as a response to the educational campaigns, because of fear of death.

#### *AIDS awareness and feelings about death in the community*

In order to assess AIDS awareness, respondents were asked to state the most common illnesses in the community. Percentage responses are presented in Table 6, which shows that about 44.7 per cent of the people in 1992/93 stated AIDS as the most common illness and this rose to 47.2 per cent in 1995. This awareness of the high prevalence of AIDS was also observed in focus-group discussions held in the study areas before the surveys.

Table 6 presents the percentages of respondents who knew people who had died or were sick with AIDS. When asked about their knowledge of death or sickness from AIDS in the community, only a minority expressed ignorance of the dead in 1992/93 (7%) and 1995 (2.9%); 31.2 per cent in 1992/93 and 4 per cent in 1995 were ignorant of AIDS-related sickness. The percentages of those with knowledge of at least 11 deaths from AIDS rose from 36.9 in 1992/93 to 52.1 in 1995. The percentage of those with knowledge of at least 11 persons with AIDS-related sickness rose from 21.3 to 55. These high percentages show considerable AIDS awareness in these communities.

The respondents were also asked how they felt about death and their attitudes and responses are presented in Table 6. Less than 14 per cent of the respondents expressed no alarm in both surveys while more than 86 per cent were worried about the situation. This worry was also reported by the elders in the focus-group discussions.

In addition, more than 86 per cent indicated that their current feelings differed from their feelings five years ago. The commonest reason for the change in feelings in both surveys was that there were too many deaths in the community. The other reason was that more young people were dying than before the surveys because of the AIDS epidemic. The communities were frightened by the frequency of deaths in their midst as a result of the epidemic.

**Table 6**  
**Per cent AIDS morbidity and mortality awareness, attitude towards death and behavioural change in the community, 1992/93 -1995**

Awareness variable	1992/93		1995	
Multiple responses about common illnesses in the community				
AIDS	44.7	(3118)	47.2	(5122)
Malaria	14.0	(978)	18.9	(2055)
Others	41.3	(2887)	33.9	(3678)
Total	100.0	(6983)	100.0	(10855)
Number of people dead of AIDS known to respondents				
None	7.0	(125)	2.9	(69)
1-10	56.1	(1004)	45.1	(1056)
11+	36.9	(660)	52.1	(1218)
Total	100.0	(1789)	100.0	(2343)
Number of AIDS patients known to respondents				
None	31.2	(559)	4.0	(94)
1-10	47.5	(850)	41.0	(961)
11+	21.3	(380)	55.0	(1288)
Total	100.0	(1789)	100.0	(2343)
Attitudes towards death				
Feeling about death				
Normal	12.5	(223)	13.5	(312)
Worrying	87.5	(1566)	86.5	(2031)
Total	100.0	(1789)	100.0	(2343)
Feeling differed five years ago				
Yes	85.6	(1531)	87.3	(2045)
No	14.4	(258)	12.7	(298)
Total	100.0	(1789)	100.0	(2343)
Why worried				
Too much death	67.3	(1031)	49.3	(1006)
Youth die of AIDS	32.7	(500)	50.6	(1034)
Total	100.0	(1531)	100.0	(2040)
Change in behaviour				
Attitude to sexual relations	53.9	(965)	44.7	(1047)
Attitude to marriage	19.5	(349)	13.4	(313)
No change	26.6	(475)	42.0	(983)
Total	100.0	(1789)	100.0	(2343)

***Behavioural change as a result of AIDS***

The study sought information on the changes in the way people behave as a result of the AIDS epidemic. Table 6 shows that more than 44 per cent of the respondents reported that people had changed their sexual behaviour. The change in sexual behaviour was also noted in all focus-group discussions.

However, Table 6 indicates that 26.6 per cent of respondents reported that there was no change in sexual behaviour of the population in 1992/93. This rose to 42 per cent in 1995, presenting a worrying situation that needs immediate attention. This concern was noted in many focus-group discussions but was mainly raised by the elders of Iganga where the custom of widow inheritance was still being practised, and in Mbale by young people who complained that their age-mates did not seem bothered by the risks of HIV infection.

Another positive change in attitudes is towards marriage as a stable union. About 20 per cent of the respondents in 1992/93 and 13.5 per cent in 1995 indicated that marriage was being recognized as the one main institution where persons can have sexual relations.

An issue related to awareness of AIDS and change in sexual behaviour is that of remarriage. Table 7 shows that an increasing population of males and females did not remarry after their spouses had died. The percentage of widowers who did not remarry increased from 42.8 in 1992/93 to 56.7 in 1995 and the percentage of widows who did not remarry rose from 70.8 to 77.6. This finding confirms the claim by the focus-group discussions that widow inheritance had greatly declined as a result of AIDS. This reflects awareness of risks related to AIDS and willingness to make lifestyle changes to avoid the dangers.

**Table 7**  
**Percentages of widows and widowers who remarried**

	1992/93 n=1183		1995 n=462	
	Yes	No	Yes	No
Sex				
Males	57.2	42.8	43.3	56.7
Females	29.2	70.8	22.4	77.6
Total	36.8	63.2	29.2	70.8
P-value	0.00000		0.00000	

***Attitudes of people towards an HIV test***

Percentages of respondents' attitudes towards an HIV test are shown in Table 8. When respondents were asked if they would go for an HIV test, about three-quarters agreed. The main reason for agreeing in both surveys was to find out about their HIV status. About 9 per cent of those who accepted the test wanted to plan for their children and 15 per cent wanted a safe marriage or safe sex. The latter reason was also given by young respondents who were planning to marry soon, in focus-group discussions in urban centres of Iganga, Hoima and Mpigi. This positive attitude was also expressed by elders in Mpigi when they said: 'Rather my girl remains at home than be married to get AIDS'.

**Table 8**  
**Respondents' attitude towards HIV test, 1992/93-1995 (% and no.)**

	1992/93	1995
<b>Would have HIV test</b>		
Yes	78.7 (1408)	71.7 (1681)
No	21.3 (380)	28.3 (662)
Total	100.0 (1789)	100.0 (2343)
<b>Reasons to accept HIV test</b>		
HIV status	75.5 (1063)	76.1 (1280)
Plan for children	8.9 (125)	9.5 (159)
Safe marriage/sex	15.6 (220)	14.4 (242)
Total	100.0 (1408)	100.0 (1681)
<b>Reasons to refuse HIV test</b>		
Fear	44.7 (170)	44.3 (293)
Trust	55.3 (210)	55.7 (369)
Total	100.0 (380)	100.0 (662)

Of those who said no to an HIV test in both surveys, about 55 per cent reasoned that they trusted their partners and there was no need to have the test. Another 45 per cent expressed fear of finding the test results seropositive since the disease has no cure. These respondents contended that it was meaningless to have the test if there is no cure and that they would lack the strength to continue living after knowing that they had the disease.

#### *The effect of AIDS awareness on attitude towards death and behavioural change*

Differentials in levels of AIDS awareness by attitude towards death and behavioural change are shown in Table 9. The table shows that a person's knowledge of AIDS patients was significantly associated with his or her feeling about death, behavioural change and willingness to have an HIV test. It is remarkable that this significant association was consistent in the baseline survey of 1992/93 and the follow-up study of 1995.

Table 9 shows that of the respondents with knowledge of AIDS patients in 1992/93, more than four-fifths were worried about death. The percentage of respondents worried rose with the number of AIDS patients known. Even among those without any knowledge of an AIDS patient about 87 per cent expressed worry about death. A similar feeling was observed in 1995. While 81.7 per cent of the people with no knowledge of an AIDS patient were worried about death, this percentage rose to 86 with knowledge of 1-10 patients and to 93 with knowledge of more than ten patients. This showed that, for respondents, it was horrifying to know a friend, colleague, neighbour, relative or any other person who was suffering from AIDS.

Table 9 shows that willingness to have an HIV test has consistently increased in both surveys. The percentage of respondents willing to have the test rose with the number of AIDS patients known. Whereas fewer than 74 per cent of the respondents unfamiliar with AIDS patients were willing to have an HIV test in both periods, the percentage rose to 84 with knowledge of 1-10 patients and to 87 with knowledge of ten or more patients in 1992/93. The respective percentages in 1995 were 72, 76 and 80. Again, AIDS awareness has been found to influence willingness to have an HIV test.

**Table 9**  
**Percentages of AIDS awareness by attitude towards death and behavioural change**

Sick with AIDS	Feeling about death		Behavioural change		HIV test	
	Normal	Worrying	Yes	No	Yes	No
<b>1992/93 (n = 1789)</b>						
None	13.5	86.5	72.1	27.9	74.3	25.7
1-10	16.3	83.7	72.0	28.0	83.7	16.3
11+	5.3	94.7	60.2	39.8	87.3	12.7
All	14.4	85.6	71.2	28.8	80.4	19.6
P-Value	0.0000		0.0000		0.0000	
<b>1995 (n = 2343)</b>						
None	18.3	81.7	68.0	32.0	72.9	27.1
1-10	13.6	86.4	58.0	42.0	76.3	23.7
11+	7.4	92.6	58.1	41.9	80.4	19.6
All	12.8	87.2	58.6	41.4	76.8	23.2
P-Value	0.0000		0.0013		0.0041	

Table 9 indicates that people's behaviour has changed as a result of AIDS awareness. More than half of the respondents reported that people had changed their sexual behaviour in both surveys. However, in both surveys, the percentage of the respondents who reported change in behaviour significantly decreased with greater knowledge of AIDS patients. This may be due to promiscuity among the youth whose attitude was that they had not been created to live forever, as reported in the focus group discussions. A similar reckless attitude by youth was found by Bagarukayo *et al.* (1993) and Muller *et al.* (1992).

It can therefore be concluded from the table that AIDS awareness in communities has raised fear of death among the people. In turn, this fear of death has resulted in positive attitudes towards HIV tests. Also, this positive attitude towards the test is an indication of a reduction in reckless sexual behaviour in the community.

#### *Tests of partial associations*

The results of a hierarchical log-linear model showing significant associations are presented in Table 10. The model was preferred because of the categorical nature of the data and because some of the variables had more than two categories. The table shows tests of partial associations between AIDS awareness, attitude towards death and behavioural variables. AIDS awareness variables include common illnesses, number of persons known dead or sick from AIDS; the variables for attitude towards death are feelings about death and difference in feelings about death since five years ago; and behavioural variables are changes in reckless behaviour and willingness to have an HIV test.

**Table 10**  
**Hierarchical log-linear model: significant tests of partial associations with AIDS awareness, change of attitude towards death and change of risk behaviour**

Effect Name	DF	Partial $\chi^2$	Prob	Iter
<b>1992/93</b>				
Q60A*Q56*Q61*Q58*Q59	4	9.919	.0418	4
Q60A*Q61*Q55A	1	3.942	.0471	4
Q60A*Q56*Q58	2	6.044	.0487	5
Q61*Q55A*Q59	2	7.419	.0245	4
Q56*Q58*Q59	4	14.093	.0070	4
Q54C1*Q56	1	9.569	.0020	5
Q60A*Q61	1	4.994	.0254	5
Q54C1*Q55A	1	7.570	.0059	5
Q56*Q55A	1	5.058	.0245	5
Q54C1*Q58	2	6.854	.0325	4
Q61*Q58	2	6.237	.0442	5
Q56*Q59	2	6.743	.0343	5
Q61*Q59	2	11.678	.0029	5
Q55A*Q59	2	11.480	.0032	5
Q58*Q59	4	219.693	.0000	4
<b>1995</b>				
Q60A*Q54C1*Q56*Q61	1	4.173	.0411	6
Q60A*Q54C1*Q56*Q59	2	6.026	.0492	8
Q54C1*Q56*Q55A	1	6.365	.0116	12
Q60A*Q61*Q59	2	9.479	.0087	10
Q56*Q61*Q59	2	12.259	.0022	5
Q56*Q55A*Q59	2	6.751	.0342	5
Q61*Q55A*Q59	2	11.656	.0029	5
Q60A*Q61	1	4.223	.0399	6
Q56*Q55A	1	68.904	.0000	6
Q61*Q55A	1	9.941	.0016	6
Q54C1*Q58	2	9.581	.0083	5
Q56*Q58	2	6.512	.0385	6
Q58*Q59	4	214.727	.0000	4

Variables:

Q61	Willingness for an HIV test
Q60A	Noticed change in behaviour
Q54C1	Common illnesses in community
Q58	Knowledge of persons dead of AIDS
Q59	Knowledge of persons sick with AIDS
Q55A	Feeling about death
Q56	Different feeling about death than 5 years ago

Table 10 shows consistent second-level variable combinations between change of reckless behaviour and willingness for the test, the number of people known dead of AIDS and common illnesses, the number of people known dead or sick from AIDS, and present feeling and different feeling about death in both surveys. In addition, this level shows the important role of AIDS awareness in attitude towards death and willingness for an HIV test, which is reflected by the number of people known sick with AIDS and common illnesses in the community in 1992/93 and those dead of AIDS in 1995. The table also shows significant third, fourth and fifth level variable combinations. These levels reflect the significant relation

of AIDS awareness and attitude towards death to change from risky behaviour and positive attitude towards HIV test.

The number of people known sick with AIDS appears in the combination of the significant variables more frequently than others, indicating that it is perhaps the most important variable. This observation confirms the bivariate analysis results. The next most frequent variables are the respondent's willingness for the test and feeling about death. Again, the positive attitude towards the test was noted at bivariate level of analysis.

It is evident that knowledge of many AIDS patients greatly affects people's attitude towards death. This is reflected by a positive attitude towards HIV testing. In addition, stigmatization of AIDS victims and the distress resulting from many deaths in the community have made people refrain from risky behaviour (Roboulot 1992).

### **Conclusions and recommendations**

The study has confirmed that recently the HIV/AIDS epidemic has declined although the rates are still high in the rural communities in Uganda. The results from the age cohorts reveal a downward trend in the epidemic in these communities. From these findings it can be concluded that there has been a real decline in the epidemic in Uganda and that the decline appears to be continuous.

The study has also revealed a high level of AIDS awareness and fear in the community. In addition, favourable changes in sexual behaviour and in attitudes towards marriage have been noted. An increasingly positive attitude towards having HIV tests was observed during the survey period. The study has also confirmed that changes in age pull down AIDS mortality rates. It can be concluded that AIDS awareness and fear, age changes, favourable changes in sexual attitudes and in marriage patterns as well as positive attitudes towards HIV testing have played a big role in the decline of the epidemic in Uganda. However, the behaviour of the young affects the statistics of this decline.

Therefore efforts to reduce the AIDS epidemic in Uganda should focus on factors conducive to favourable change in sexual behaviour and to safe marriage. Extension of AIDS awareness programs to rural communities would be helpful. Provision of accessible HIV testing centres and counselling will encourage more people to accept HIV testing. Other control mechanisms closely related to sexual behaviour and attitudes, such as use of condoms for safe sex and abandonment of risky socio-cultural practices, need to be emphasized in order to sustain the decline of the AIDS epidemic.

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