

**National trends in AIDS knowledge  
and sexual behavior in Zambia 1996-98**

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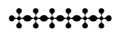
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## National trends in AIDS knowledge and sexual behavior in Zambia 1996-98

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**ABSTRACT**

- Objective:** To describe the trends in AIDS knowledge and sexual behaviour in Zambia between 1996 and 1998.
- Design:** Analysis of data collected in two nationally representative surveys.
- Methods:** Analyses were stratified by sex. In order to assess whether there had been changes in the levels of knowledge and high risk sexual behaviour over the two-year period, differences between estimated population proportions between both surveys were tested across several indicators, based on robust estimates of variance.
- Results:** Levels of knowledge about AIDS transmission were already high in 1996, and very little change was observed over the two-year period. The proportion of men with multiple sexual partners decreased, and there was a lower level of premarital sexual activity among men. In 1996, 20.8% of men reported having two or more partners during the last year, compared to 15.2% in 1998 ( $p=0.002$ ). Among men with four or more partners, the figures were 6.7% and 4.9%, respectively ( $p=0.05$ ). Likewise, there was an increase of never married men who reported no sexual activity between the two years, with 35.8% in 1996 and 52.6% in 1998 ( $p<0.001$ ). There was virtually no change observed in women's sexual behavior during the same period. Condom use with non-regular partners among men and women has declined.
- Conclusions:** After a decade of HIV-prevention activities in Zambia, one of the most severely affected countries in the world, some favorable changes in indicators of male sexual behaviour have been observed during 1996-1998. Other areas showed little change, indicating the need for renewed efforts in HIV/STD prevention programmes.

## INTRODUCTION

Since the onset of the AIDS pandemic, many countries have established national AIDS programmes. HIV-prevention efforts aiming at promoting safer sexual behaviour have taken a central place in these programmes. Hitherto, only a few countries have data that allow for an assessment of trends in sexual behaviour. During 1989-1991, at least 12 countries carried out a national sample survey on AIDS-related knowledge, attitudes, behaviour, and practices (KABP) that was supported by the World Health Organization's Global Programme on AIDS.[1] Many more countries used the same instrument on sub-national samples. Other KABP studies were conducted during the 1990s, but very few were nationally representative.[2] In Thailand, national surveys in 1990 and 1993 showed a rapid increase in AIDS knowledge, a decline in visits to female sex workers, and an increase in self-reported condom use with commercial sex workers.[3] Four national surveys in Jamaica suggested an increase in condom use over time.[4] In Tanzania, an analysis of a national KABP survey and two national Demographic and Health Surveys (DHS) observed modest changes in sexual behaviour,[1,5,6] which was corroborated by findings from a cohort study.[7] In most countries, data on trends in AIDS knowledge and sexual behaviour are limited to smaller populations. For example, the main evidence of changes in sexual behaviour in Uganda are survey data from two urban areas.[8] In Senegal, data from urban areas and a small rural cohort study suggest changes in knowledge and sexual behaviour over a period as short as two years.[9,10]

This study presents the results of a trends analysis of two nationally representative surveys in Zambia, conducted in 1996 and 1998. Zambia is one of the countries more severely affected by the AIDS epidemic, with national HIV prevalence among antenatal women estimated at 20

percent in 1994.[11] By the mid- to late 1990s, general awareness about AIDS was almost universal in the most affected countries of Africa, with the majority of the population having some further knowledge about HIV infection.[6,12-14] AIDS programmes and projects on both the national and local levels have continued their efforts to promote safer sexual behaviour. In this context, the two surveys present a unique opportunity to assess trends in sexual behaviour after a decade of HIV-prevention efforts and during a period that AIDS morbidity and mortality is likely to have become more visible to the general population.

## **MATERIALS AND METHODS**

Zambia had a total population of 7.8 million at the last census in 1990, with an annual growth rate of 2.7%. About 40% of Zambians live in urban areas, but this proportion varies considerably by province. The present analysis is based on two surveys that took place in 1996 and 1998, which used the same sampling frame. The 1996 Zambia Demographic and Health Survey (ZDHS) drew a nationally representative sample of women and men of reproductive age to collect a range of information on fertility, maternal and child health, AIDS, STDs and sexual behavior. The survey was designed to produce reliable estimates for the nation as a whole, for urban and rural areas separately, and for each of the nine provinces in the country.

The ZDHS used the sampling frame which was developed for the 1990 Zambian census. The census divided the country into about 4,200 census supervisory areas (CSAs), from which 312 were selected for the ZDHS using probability proportional to size methods. The household lists for the CSAs were updated to reflect the change in the number of households per standard enumeration area between 1990 and 1996. Households were selected using a three-phase

procedure, with each province being stratified by urban and rural areas. All women in selected households between the ages of 15-49 were eligible to be interviewed. In a quarter of these households, all men aged 15-59 were eligible. The overall response rate for the survey was 96.1% for women and 90.5% for men, with a resulting sample size of 8,021 women and 1,849 men. The less populated provinces of the country were over-sampled in order to ensure the minimum sample size needed for analysis in these areas. Due to this non-proportional sampling distribution, sampling weights were required to ensure that the resulting estimates were nationally representative. More detail about the sampling procedures and survey design can be found elsewhere.[14]

The Zambia Sexual Behaviour Survey (ZSBS) took place in 1998, with the objective of obtaining national estimates of key indicators of HIV/STD prevention, including knowledge, attitudes and sexual behavior. The ZSBS used the sampling frame developed for the ZDHS and randomly selected 80 of the 312 original CSAs. The household lists for these selected CSAs were updated for the ZSBS. All individuals aged 15-49 were eligible to be interviewed. The questionnaire was translated into the seven major languages spoken in Zambia, and was pilot tested in urban and rural communities one month prior to fieldwork. The response rates were similar to the ZDHS, with 95% of eligible women and 92% of eligible men being successfully interviewed. The final sample size was 2,040 women and 1,655 men. The survey and sampling procedures are explained in further detail elsewhere.[15]

The type of information collected on AIDS knowledge and sexual behavior was similar for both surveys. Some wording of questions differed and a few areas were explored in more detail in the



ZSBS, since this was the primary focus of the survey. The choice of indicators for the trends analysis was guided by the availability of information from both surveys that enabled identical variables to be constructed and compared.

### **STATISTICAL ANALYSES**

Due to the variation in AIDS knowledge and sexual behavior between women and men, analyses were stratified by sex. The total female samples from both surveys were used in the analyses, resulting in 8,021 and 2,040 women for 1996 and 1998, respectively. Since the male age criteria differed between the two surveys, men from the ZDHS who were 50 years and older were excluded from the analyses, leaving a total of 1,727 men for 1996 and 1,655 men for 1998. The sample weights developed for the ZDHS were used for both the women and men in order to produce national estimates. For the ZSBS, weights were constructed to reflect the urban proportion of 15- to 49-year-old women and men in Zambia, based on the findings of the ZDHS, which were 44.9% for women and 46.7% for men.[14]

Descriptive statistics were used to explore the differences in the distributions of the two samples of women and men across age, education, and marital status. Estimated population proportions of women and men are presented for 1996 and 1998 for the remaining factors. Differences in the estimated proportions between the two years were tested separately for women and men, using a two-tailed z-test of significance.[16] The results of these tests, where significant at the 0.05 level, are presented in the text. Intraclass correlation created by the design effect of both surveys was controlled for in the tests of difference by obtaining robust estimates of variance for

the population proportions, using the survey command options in Stata version 6.0.[17] SAS version 6.12[18] was also used for the statistical analyses.

## RESULTS

### Background Characteristics

The age, educational level and marital status of women and men in 1996 and 1998 are shown in Table 1. Very little difference was observed between the two years across age and education, as would be expected. The proportion of single women in 1998 (41.0%) was slightly larger than in 1996 (39.2%), with a corresponding decrease in the proportion of women in polygamous unions between the two years. The proportion of single men decreased by 6% and there was an increase in the number of men in monogamous unions; there was only a slight increase in the proportion of men in polygamous unions. Examining male marital status by age for both years (not shown) revealed that the majority of this change took place among men aged 20-29; 41% of these men were in a marital or cohabiting union in 1996, compared with 47% in 1998 ( $p=0.10$ ).

**Table 1 about here**

### Knowledge Pertaining to Aids and Condoms

Table 2 shows the changes in individuals' knowledge about AIDS and condoms. Almost all individuals had heard of AIDS by 1996, and there was very little change in 1998 for both sexes. Changes among women and men over time were variable for the remaining factors. Among women who had heard of AIDS, 83.8% said that infection could be avoided in 1996, compared with 79.7% in 1998 ( $p=0.02$ ). Among men the decrease was slightly greater, with 94.7% in 1996 and 87.5% in 1998 ( $p<0.001$ ). In both years, over 99% of respondents who said AIDS could be

avoided mentioned at least one way that pertained to safer sexual practices (not shown), including condom use, having fewer partners, and avoiding casual sex. There was a slight increase in the proportions of respondents over the two-year period who knew that a person infected with HIV could appear healthy.

### **Table 2 about here**

There were significantly more women who knew someone who was infected with HIV or who had died of AIDS, with 67.0% in 1996 and 73.4% in 1998 ( $p < 0.001$ ). A more modest increase was observed in the proportions of men who reported the same. The majority of individuals in Zambia had heard of condoms in 1996, and this remained fairly constant in 1998 for both women and men. About three quarters of women reported that they knew where to obtain condoms in both years. Among men, there was a small but statistically significant increase observed. In 1996, 86.3% of men knew a place where condoms were available, compared with 90.4% of men in 1998 ( $p = 0.01$ ).

### **Sexual Behavior**

Among women, there was very little change in any of the three measures of sexual abstinence (Table 3). Significant differences were observed among men. There was only a slight increase in the proportion of men who had never had sex at the time of interview (11.8% to 12.2%), but larger differences were observed for the other two indicators. In 1996, 37.7% of men reported that they had no sex during the past month, as compared to 42.0% of men in 1998 ( $p = 0.06$ ). The increase in the proportion of never married men reporting no sexual activity within the last year was even larger, with 35.8% in 1996 and 52.6% in 1998 ( $p < 0.001$ ).

**Table 3 about here**

Figure 1 depicts the patterns of sexual activity among adolescents, showing the proportion of 15 to 20 year olds who had ever had sex at the time of interview, by single year of age. Fewer adolescent girls than boys had sexual intercourse at the younger ages; the percent of girls and boys are closer above age 17. Among girls, there was very little change in the pattern of sexual activity between the two years. Fewer boys reported having sex in 1998 as compared to 1996 for all ages except 15 and 18, with the largest differences observed for 16 and 17 year olds. There was a difference of 5.3% and 11.9% between the two survey years at these ages, respectively. None of these differences were statistically significant, partly due to the small numbers of men in each age group. Although there appears to be a slight downward trend among boys who had ever had sex, the decreases observed for sexual abstinence among men in Table 3 appear to apply to recent changes in sexual activity between the two survey years, rather than to a delay in the onset of sexual activity.

**Figure 1 about here**

Overall, few women report sexual activity with non-regular partners during the last year in both 1996 and 1998, but modest increases were observed in these indicators, as shown in Table 3. Among all women, 2.8% reported having two or more non-regular partners in 1996, and 3.4% reported the same in 1998. Among women currently in a regular union, 1.4% reported having sex with someone other than their spouse/regular partner in 1996, as compared with 2.3% in 1998. A statistically significant decrease in the proportion of men with multiple partners during the last year was observed over the two-year period. In 1996, 20.8% of men reported having two or more partners during the last year, compared to 15.2% in 1998 ( $p=0.002$ ); the proportions who reported four or more partners were 6.7% and 4.9%, respectively ( $p=0.05$ ). Very little difference

was observed in the proportions of men currently in union who had sex with at least one other person other than their spouse during the last year.

The last two indicators in Table 3 pertain to condom use. Only a fifth of women reported ever having used a condom, with almost no change over the two-year period. Among women with non-regular partners during the last year, 20.6% reported using a condom the last time they had sex with such a partner in 1996, and 19.0% reported condom use in 1998. Among men with non-regular partners during the last year, there was a notable decrease in the proportion who used a condom at last sex. In 1996, 37.5% of men reported condom use at last sex with a non-regular partner, compared to 28.9% in 1998 ( $p=0.003$ ).

In order to explore whether changes in knowledge and behaviour were taking place disproportionately in urban versus rural areas, analyses were stratified by residence (Table not shown). Trends for both women and men were generally similar for both areas. The major difference observed by residence was in the proportion of single men reporting no premarital sex in the last year, where the increase was more marked in urban areas. In 1996, 35.5% of urban men reported no premarital sex as compared to 58.2% in 1998. The corresponding figures for rural men were 36.1% and 46.7%, respectively. The decline in condom use at last sex with a non-regular partner was also greater in urban areas. Among urban men with a non-regular partner, 47.9% reported that they used a condom in 1996 compared with 34.5% in 1998. Among rural men, the proportions were 27.0 and 24.3% in 1996 and 1998, respectively.

## DISCUSSION

This analysis of trends in AIDS knowledge and sexual behaviour in Zambia from 1996 to 1998 does not indicate that dramatic and rapid changes are taking place. On the positive side, there is some evidence of a decline in the proportion of men with multiple sexual partners and a lower level of premarital sexual activity among men. However, there is virtually no evidence of changes in sexual behaviour among women, and there is a decline in the use of condoms in non-regular partnerships. By the same token, there appears to be little change in levels of knowledge about HIV transmission, which was already high, but not universal in 1996. Prior to making an attempt to interpret these findings, a number of potential biases need to be considered.

Many authors have questioned the validity and reliability of self-reported sexual behaviour.[19-21] In line with findings from many other studies,[1] both surveys in Zambia found much lower levels of multiple partnerships and condom use among women as compared to men. This may be due to genuine differences, underreporting of non-marital sexual behaviour by women, over-reporting by men, or both. A more striking finding of this study, however, is the high level of consistency that was found for most indicators between the two surveys. If indeed no real changes have taken place during 1996-98, this implies high levels of reliability of the sexual behaviour measures. This occurs in spite of possibly increased social desirability biases, which could cause more respondents to report safer sexual behaviours because they are promoted as part of HIV-prevention activities in the country.

The differences in survey context and questionnaire design may also have affected the results. The ZDHS 1996 interview focused on family planning and, for women, maternal and child health issues; the questions on sexual behaviour are only posed in the second half of the

interview when more than 30-45 minutes have passed. In the 1998 ZSBS, sexual behaviour is addressed after a short introductory section and about 10-15 minutes of interviewing. The ZSBS also asked many more questions about partnerships than the ZDHS. In general, however, the results appear very consistent. The main point of concern is perhaps the fairly large decline in condom use at last sex with a non-regular partner between the two surveys. There are no clues in the survey or questionnaire design that may explain the decrease.

Two years is probably too short a period in which to expect major changes in knowledge and sexual behaviour. Yet, there have been several studies—such as in Thailand 1990-93,[3] the rural Senegal 1992-94,[10] urban Tanzania,[7] and urban Uganda 1990-95[8]—that have documented major changes over relatively short periods of time. In the case of Zambia, there is some evidence that the proportion of younger and older men with multiple partners has declined in both urban and rural areas, and that this decline is most pronounced among men with many partners. At the same time, a decline in condom use in non-regular sexual partnerships was also observed. This may in part be due to changes in the nature of sexual partnerships, most notably, a reduction in casual sexual encounters. Condom use often declines with the duration of a partnership and a decrease in the frequency of casual sexual encounters. In-depth anthropological work in Zambia has revealed numerous cultural barriers to the use of condoms in Chiawa, a rural area in Lusaka province. These included stigmas due to their association with disease and infidelity and perceptions of what needed to take place during a sexual encounter.[22] An analysis of trends in this area was not possible as questions about the duration of partnerships were only asked in the ZSBS, which found that 12% of the 973 non-regular partnerships reported in the last year by men lasted only one day.[15] It is also possible that

condom accessibility declined, although a higher proportion of respondents in 1998 reported that they knew a source of condoms, compared with 1996.

In several studies, changes in sexual behaviour were first observed among adolescents. For example, in Uganda, a rapid increase in the age at first sex and condom use was reported.[8] In Zambia, there were no changes in the age at first sex or adolescent condom use between 1996 and 1998, but a decrease in sexual activity and an increase in marital activity was observed among men. This indicates that only multiple indicators can capture some of the more subtle changes in sexual behaviour that may take place over time among adolescents. There was virtually no change in sexual activity among adolescent women, which in part may be related to the age difference between sexual partners as the male partners were older; in the ZSBS the median age difference was 3.7 years.[15] Previous studies in Zambia have also shown that adolescent sexual activity was high[23], even though students often disapprove of premarital sex when asked in a survey.[24,25]

The comparison of knowledge levels were rather limited because of differences in the questions in the 1996 ZDHS and 1998 ZSBS. Since awareness about AIDS was universal and levels of further knowledge were fairly high in 1996, we might not expect to see a dramatic change after two years. A national DHS in 1992 among women indicated that 99% of women were already aware of AIDS. Among these women, 63% thought that AIDS could be prevented and 83% knew that a healthy-looking person could be infected with HIV.[26] In 1996, the corresponding knowledge figures for women were 84%. It is discomfoting, however, that the proportion of respondents who said AIDS can be avoided decreased during 1996-98. This finding is important and should perhaps be interpreted in the context of increasing morbidity and mortality associated



with AIDS. Evidence suggests that there is a growing awareness of the worsening situation in Zambia since more individuals have been personally affected by the epidemic, as indicated by the larger proportions of women and men who knew someone who was infected with HIV or had died of AIDS. Certainly, this has increased notably from the early 1990s. A 1990 survey of women and men in Lusaka showed that only 56.5% knew someone with AIDS at that time, in an exclusively urban environment.[27] Even if knowledge levels are high, there is a pressing need for continuing quality education of the general public since many people may lose faith in the possibility of prevention if many members of their communities are affected by AIDS. Programmatic activities need to continue emphasizing that preventing infection is attainable, as well as exploring ways of influencing behaviour change to safer sexual practices in the long term.

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**Table 1. Socio-demographic characteristics of women and men in Zambia, 1996 and 1998.**

Characteristics	Women				Men			
	1996		1998		1996		1998	
	n	%	n	%	n	%	n	%
Age								
15-19	2003	25.0	491	24.1	459	26.5	383	23.1
20-29	3116	38.9	828	40.6	657	38.1	632	38.2
30-39	1840	22.9	448	22.0	408	23.6	421	25.5
40+	1062	13.2	273	13.3	203	11.8	219	13.2
Level of school completed								
None	1067	13.3	313	15.4	112	6.5	106	6.4
Primary	4721	58.9	1172	57.4	863	50.0	783	47.3
Secondary	2006	25.0	510	25.0	666	38.5	698	42.2
Higher	226	2.8	45	2.2	86	5.0	68	4.1
Married or in cohabiting union								
No	3147	39.2	837	41.0	895	51.8	762	46.3
Monogamous	4062	50.6	1040	51.0	757	44.4	815	49.4
Polygamous	812	10.1	163	8.0	64	3.7	70	4.3
Total sample	8021		2040		1727		1655	

**Table 2. Comparison of knowledge pertaining to AIDS and condoms, Zambia 1996 and 1998.**

	Women		Men	
	1996 %	1998 %	1996 %	1998 %
Has heard of AIDS	99.6	99.1	99.6	98.8
Knows AIDS can be avoided <sup>1</sup>	83.8	79.7*	94.7	87.5**
Knows HIV-infected person can appear healthy <sup>1</sup>	81.8	83.9	87.9	88.3
Knows person infected with HIV or one who has died of AIDS <sup>1</sup>	67.0	73.4**	69.4	71.6
Has heard of condoms	94.3	92.3	96.7	96.6
Knows where to get condoms	74.9	75.5	86.3	90.4*
Total sample	8021	2040	1727	1655

<sup>1</sup> Includes only those individuals who have heard of AIDS, with the following sample sizes: Women 1996, n=7980; Women 1998, n=2019; Men 1996, n=1720; Men 1998, n=1633.

\* p < 0.05, \*\* p < 0.001

**Table 3. Comparison of reported recent sexual behavior, Zambia 1996 and 1998.**

	Population Included	Women				Men			
		1996		1998		1996		1998	
		n	%	n	%	n	%	n	%
<b>Sexual Abstinence</b>									
Never sexually active	All	7999	11.8	2039	12.3	1717	11.8	1654	12.2
Not sexually active in last month	All	8021	48.2	1976	46.0	1727	37.7	1638	42.0~
No premarital sex within last year	Never married	2032	60.1	529	60.1	812	35.8	680	52.6**
<b>Multiple Partnerships</b>									
Two or more non-regular partners in last year <sup>1</sup>	All	8021	2.8	1788	3.4	1727	20.8	1451	15.2*
Four or more non-regular partners during last year <sup>1</sup>	All men					1727	6.7	1451	4.9~
Sex with person other than spouse past year	Currently in union	4068	1.4	1184	2.3	832	20.8	884	20.0
<b>Condom Use</b>									
Ever used condoms	All	8021	21.6	1184	21.1	1727	45.0	1591	42.3
Used condoms with non-regular partner at last intercourse <sup>1</sup>	All with non-regular partners	1443	20.6	351	19.0	596	37.5	536	28.9*

<sup>1</sup> Non-regular partners were those with whom an individual had sex, who were not either married to or living with the respondent at the time of interview.

~p < 0.10, \* p < 0.01, \*\* p < 0.001

**Figure 1. Proportion of adolescent women and men in Zambia who have ever had sex, by age at the time of each survey, 1996 and 1998**

