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# MEMO

TO Interested Parties

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SUBJECT The role of behavior change in the decline in HIV prevalence in Uganda

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## Background

Accumulating evidence supports the conclusion that HIV *prevalence* has declined significantly in Uganda during the 1990s, probably accompanied by a somewhat smaller decline in HIV *incidence* in the latter half of the decade.<sup>1</sup> These declines are encouraging, although the magnitude of the change at the national level is likely to have been smaller than reported in some sources.<sup>i</sup> The accuracy of measures of HIV prevalence or incidence is dependent on the availability of representative data on HIV screening of the general population; the quality of measurement of trends over time is dependent on having comparable data over the period being studied.

The size of the decline in either prevalence or incidence is difficult to pinpoint for Uganda as a whole, because measurement in the early period of the epidemic is based on a few urban surveillance sites that provide data for pregnant women tested in antenatal clinics.<sup>ii</sup> These early measures show very high prevalence levels among pregnant women: 25-30% in the period 1989-1992. However, these levels should not be generalized to all Uganda, because pregnant women are not representative of the general population, and because urban-based measures are not representative of the country, which is 85% rural. HIV prevalence data from rural surveillance sites that have become available in the mid- to late 1990s are much lower, suggesting that national HIV prevalence in the early 1990s was much lower than 25-30% .

While these qualifications are important, the data from the various surveillance sites taken as a whole do show a decline in HIV prevalence. UNAIDS/WHO's estimate of the trend in HIV prevalence in Uganda, based on all available sentinel surveillance data for pregnant women (the only population group with sufficient trend data to document change over the decade), shows a decline in major urban areas from a median of about 30% in 1990 to a median of 14% in the late 1990s, and a decline outside of major urban areas from a median of about 13% in 1992 to about 8% in the late 1990s. National adult (15-49) prevalence was estimated to be 8.3% in 1999 and 5% in 2001.<sup>iii</sup> New information for a rural population in southwest Uganda has documented

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<sup>1</sup> Prevalence is measured as the proportion of the general population that is infected at a given point in time; incidence is the number of new cases diagnosed per year, and is usually expressed as the number of new cases per 1,000 people in the general population.

a decline in HIV incidence from 8.0 cases per 1,000 person years in 1990 to 5.2 cases in 1999. This study also found a decline in HIV prevalence from 10% in 1990 to 8% in 1999 among all adults 15-49.<sup>iv</sup>

A great deal of attention has recently been focused on understanding the reasons for declining HIV prevalence in Uganda.<sup>v</sup> The allocation of development funds to combat HIV, not just in Uganda but in other countries as well, could be significantly affected by findings from Uganda. Unfortunately, this question has become highly politicized, and some have argued that abstinence and monogamy played a much more important role in the decline in HIV prevalence and incidence in Uganda than has condom use.<sup>vi</sup> Yet, it is more likely that all three of these factors contributed to the decline in HIV. In addition, broad social factors, including political commitment and support at the highest levels for a multisectoral approach for combating the HIV epidemic, were undoubtedly important indirect forces in forming a context for, and contributing to, the decline. These include the public support of President Museveni for a comprehensive approach to containing the epidemic, including widespread media campaigns, along with other interventions to educate all sectors of the population about the HIV epidemic, the modes of infection and of prevention, and the importance of fighting stigma and discrimination against people infected with HIV.

Several studies in Uganda have documented levels and trends in abstinence, behavior change and condom use for particular geographic areas and population groups in the direction of decreasing risk.<sup>vii</sup> However, such data may not be representative of the entire country. Fortunately, nationally representative Demographic and Health Surveys (DHS) that included questions about sexual behavior and condom use have been carried out in recent years among all women and men of reproductive age in Uganda. The surveys of women span a good part of the period during which HIV prevalence has declined (1988, 1995 and 2000), while the surveys of men cover only the recent period (1995 and 2000). The DHS data are useful because they provide evidence on key factors for the country as a whole, and may therefore more appropriately be applied to understanding changes in the national rates of HIV prevalence and incidence than would studies of particular areas of the country.

We seek to contribute to the understanding of reasons for the decline of HIV in Uganda by examining available DHS evidence for possible changes in key behaviors that might have directly affected people's risk of contracting HIV and, in so doing, have lowered the country's infection rate:

1. Increased sexual *abstinence*, i.e. (a) fewer people who have ever had sex, measured as an increase in the age at initiation of sexual activity among young people and a decrease in the proportions of women and men who have ever had sexual intercourse; and, (b) fewer sexually experienced people who continue to have sexual intercourse, measured as an increase in the proportions of youth and adults who have ever had intercourse but who are not sexually active.<sup>2</sup>
2. An increase in the proportion of people in *monogamous relationships*, measured as (a) a reduction in the proportions of unmarried, sexually active men and women who had multiple sexual partners; and, (b) a reduction in extramarital sexual relationships among married men and women.

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<sup>2</sup> "Currently sexually active" is defined to be having had intercourse in the three months before interview.

3. An increase in *condom use* among sexually active men and women.

This memo summarizes changes in the behaviors for which data are available, and addresses differences by gender, age and marital status. Although the national survey data presented here are limited, these analyses can be useful for those involved in policies and programs aimed at reducing HIV in Uganda: They address behaviors that play a crucial role in HIV transmission and therefore elucidate the need for and potential of interventions aimed at changing these behaviors so as to further stem the HIV epidemic.

## **Methodology**

The data presented in this memorandum were tabulated from the 1988 DHS survey of Ugandan women aged 15-49 and the 1995 and 2002 DHS surveys of Ugandan women and men aged 15-49 in Uganda. Weights provided by the DHS were used to calculate measures that are nationally representative.

Although the total national samples for women are very large and those for men are quite large (see Appendix Table 1), subgroups of women and men by age and marital status are much smaller. Measures are less precise when they are based on smaller numbers of respondents. For example, the standard error around the proportion of all women who had never married in the 2000 survey (20.1%) is 0.7%, which means that the 95% confidence interval around the estimate of 20.1% is 18.7% to 21.5%. The parallel proportion for all men who had never married is 34.4%, with a sample error of 1.4% and a 95% confidence interval of 31.7% to 37.2%. Relative standard errors (RSE, or the sample error divided by the value, expressed as a percentage) are typically under 5% for most measures for all women and men; however, the RSE can rise to 10-15% for measures with low values (for example, the percentage using the condom among all currently married women). To take into account situations when the sample size is too small to provide a reliable estimate, age-groups are collapsed when necessary to maintain a minimum sample size (25 unweighted respondents). For most measures presented here, the number of respondents is much larger than this. Groups that have a large margin of error because of their small size, even after collapsing age-groups, include married adolescent men and unmarried men and women aged 30-49. Because sample variation is sizable for small groups, interpretation and conclusions from the data presented should rest on both the size of differences and the existence of systematic patterns or trends.

The data presented here were obtained through in-person interviews and were self-reported by respondents. Given the sensitive nature of the information, there is likely to have been underreporting of some behaviors, possibly more so among unmarried women, for whom social acceptance of sexual activity would be lower than for unmarried men. The well-documented tendency for respondents to give answers that are more socially desirable may result in apparent, but inaccurate, changes over time in the proportions who report sensitive behaviors (e.g. sexual activity while unmarried, multiple partners or condom use); moreover, such changes could be in either direction, depending on changes in what behaviors are considered to be socially desirable. However, assessment of bias in the reporting of age at first intercourse across

the three Ugandan DHS surveys found that consistency of reporting across cohorts was quite high for both women and men.<sup>viii</sup>

The available data can help identify whether the factors being considered are likely to have contributed to lowering risk for HIV infection, and can also provide an indication of the size and importance of the different factors. However, these data cannot provide a precise assessment or ranking of the relative importance of each of the different factors for a number of reasons:

- The size and timing of the decline in the outcome variable of interest (decline in HIV prevalence or incidence) is itself not measured exactly, and it is probably not possible to measure it with precision, since we must rely on what data were collected and are available from the early years of the epidemic.
- Information for population subgroups is limited. HIV prevalence and incidence are even less precisely measured by gender and age-group than for the nation as a whole. This makes it difficult to identify how differing levels of behavior change by these subgroups may contribute to the overall change in HIV prevalence for the population as a whole. In addition, differences in behaviors related to HIV risk are also likely to exist across other population groups (based on geographic area, ethnicity, religion or other characteristics), but it is not feasible with available data to analyze how behaviors differ across all relevant groups or how HIV prevalence has been affected by subgroup changes in these behaviors.
- Available information about sexual behavior and sexual partnerships is limited. For example, while we can measure declines in multiple partnerships and in extramarital relationships, we cannot directly draw out the implications of these changes for the prevalence of HIV for particular age-groups, since we do not have specific information on the age of each partner. We also lack other relevant information, such as duration of relationships, extent to which relationships overlap, frequency of intercourse for each relationship, specific sexual practices, condom use with different partners and partners' behavior or HIV risk status.
- Increased effectiveness of condom use (through improved consistency and correctness of use) could also be an important factor in reducing HIV transmission, but measures of change in these factors are not available.
- Other factors may also affect the rate of transmission of HIV. For example, the role of male circumcision in reducing HIV risk has recently become clear, and this is a factor that would interact with all of the other behaviors mentioned above.<sup>ix</sup> In addition, the impact of HIV infection on fecundability of women will impact on childbearing and on transmission from mothers to infants.<sup>x</sup>

## Findings

### 1. Abstinence

#### *(a) Fewer Ugandans begin sex at young ages.*

***Age at initiation of sexual intercourse has increased for young women and men.*** The median age at first intercourse among young women in Uganda increased from 15.9 in 1988 to 16.3 in 1995 and to 16.6 in 2000 (as reported by women aged 20-24 in each survey) (Figure 1). Among young men, the median age at first intercourse rose more steeply over the period 1995-2000, from 17.3 to 18.5.

***The proportion of young women and young men who had ever had sex has decreased.*** Between 1988 and 1995, the proportion of adolescents 15-17 who were sexually experienced had declined slightly, from 50% to 46%; by 2000, however, the proportion had dropped to 34% (Table 1, Panel 1, Women; Figure 2). The decline among women 18-19 was much smaller, from 81% in 1988 and 82% in 1995 to 77% in 2000. These decreases had little impact on the proportion of all women aged 15-49 who ever had intercourse, because most women of reproductive age are aged 20 and older and almost all of them are sexually experienced.

Patterns were different among young men. There was little change between 1995 and 2000 in the proportion of younger adolescent men (aged 15-17) who were sexually experienced (29% in 1995 and 27% in 2000) (Table 1, Panel 1, Men; Figure 3). However, the proportion of men aged 18-19 who ever had sex declined noticeably, from 71% in 1995 to 59% in 2000. These changes are reflected in a slight decrease in the proportion of all men aged 15-49 who were sexually experienced: 86% in 1995 compared with 83% in 2000.

#### *(b) There has been no general pattern of increased abstinence among those who were sexually experienced .*

***Changes in marriage among youth and young adults were countered by changes in nonmarital sexual activity.*** Trends in the proportions of young women and men who had ever had intercourse reflect divergent trends in marriage and in the sexual behavior of unmarried young people. The proportions of adolescent women 15-17 and 18-19 who had ever married rose between 1988 and 1995, then declined sharply between 1995 and 2000 to levels lower than in 1988 (Table 1, Panel 2, Women; Figure 2). Changes were smaller, though in similar directions, among women aged 20-24. Among never-married adolescent women, the proportions who were sexually experienced decreased between 1988 and 1995, but then rose between 1995 and 2000, albeit to lower levels than in 1988 (Table 1, Panel 3, Women). The proportions of never-married women in their 20s who had ever had sex was as high or higher in 2000 than in either previous survey year. As a result, sexually experienced, never-married women accounted for smaller proportions of all adolescent women and all women in their early 20s in 1995 than in 1988, but about the same proportions in 2000 as in 1988 (Table 1, Panel 4, Women).

Between 1995 and 2000, the proportions of adolescent men aged 18-19 and young men in their early 20s who had ever married declined noticeably (Table 1, Panel 2, Men; Figure 3).

There was also a drop in the proportion of never-married men aged 18-19 who had ever had intercourse, but little change among those aged 15-17 and 20-24 (Table 1, Panel 3, Men). The proportion of men aged 18-19 who were sexually experienced and never married was lower in 2000 than in 1995, reflecting the fact that while there were more never-married men, fewer of them were sexually experienced. However, the proportion of men aged 20-24 who were sexually experienced and never married rose between 1995 and 2000 (from 34% to 42%, Table 1, Panel 4, Men), primarily because there were more never-married young adult men, even though there was little change 1995-2000 in their levels of sexual experience.

***More sexually experienced adolescent men and sexually experienced women aged 15-17 were never married than were married in 2000 than in the previous survey years.*** The net effect of changes in marriage and in sexual experience among those who had never married is that adolescent women in 2000 were less likely to have sexual intercourse, and therefore to be exposed to the risk of HIV infection, *within marital unions* than their counterparts in 1988, but they were almost as likely to have intercourse and to possibly be exposed to HIV, *in nonmarital sexual relationships* in 2000 as in 1988. These patterns of change are similar among younger (15-17) and older teens (18-19), but changes are larger among the younger women (Table 2, Panel 1, Women). In 2000, 59% of sexually experienced young women aged 15-17 had never married, compared with 46% in 1988. In fact, in all three surveys and among all other age-groups, most sexually experienced women were married.

Most sexually experienced adolescent men had never married in both 1995 and 2000 (Table 2, Panel 1, Men). The proportion of sexually experienced men who had never married increased between 1995 and 2000 among men aged 18-19 and those aged 20-24.

***There was no consistent change in the proportion of sexually experienced women and men who were currently sexually active.*** The proportion of sexually experienced young women aged 15-17 who were currently in a sexual relationship decreased from 77% in 1988 to 68% in 2000, after an increase from 1988 to 1995 (Table 2, Panel 2, Women; Figure 4). There were small changes for other age-groups and no systematic pattern in terms of direction (increase or decrease).

There was an increase in current sexual activity (or a *decrease* in abstinence) among sexually experienced adolescent men between 1995 and 2000 (Table 2, Panel 2, Men; Figure 5). The proportion of sexually experienced men 15-17 who were currently in a sexual relationship rose from 33% in 1995 to 45% in 2000; the proportion among men aged 18-19 rose from 58% to 72%. Small increases in current sexual activity occurred among some older age-groups, but this was not a systematic pattern.

***The proportion of all people currently sexually active dropped substantially only among young adolescent women and increased across some age-groups of men.*** The proportion of all women aged 15-17 who had had sex in the last three months decreased steeply from 39% in 1988 and 37% in 1995 to 23% in 2000 (Table 2, Panel 3, Women; Figure 6), reflecting decreases in both the proportion who ever had sexual intercourse and the proportion of sexually experienced 15-17-year-old young women who were currently sexually active. There

was also a decrease among women aged 18-19, from 71% in 1988 to 66% in 2000. There was little change among women in the other age-groups.

Among men, the proportions currently in a sexual relationship increased for those aged 15-17, 25-29, 40-44 and 45-49 (Table 2, Panel 3, Men; Figure 7). Other age-groups showed little change.

## 2. Monogamy

Information on sexual partners is available for both women and men only for the years 1995 and 2000.<sup>3</sup> We have measured the proportion of sexually active people who were monogamous as the proportion who had only one sexual partner in the one-year period before the survey. For the unmarried, this measure is based on those who had been sexually active in the past year; for the currently married, the measure is based on all who were married at the time of survey.<sup>4</sup>

***Fewer unmarried, sexually active women in all age-groups had two or more partners in 2000 than in 1995, but proportions increased for most age-groups of unmarried men.*** The proportion of unmarried, sexually active women<sup>5</sup> who reported having had two or more partners during the past year declined among all age-groups, with an overall reduction from 10% in 1995 to 4% in 2000 (Table 3, Panel 3, Women; Figure 8). There was less consistent change among unmarried men who had been sexually active during the past year (Table 3, Panel 3, Men; Figure 9). The proportion of sexually active single men who had two or more partners in the past year was 24% in 1995 and 27% in 2000. There was a small decline in multiple sexual partnerships among 18-19-year-old men (from 32 to 28%), but older unmarried men (aged 25-29 and 30-49) reported large increases in the proportion who have had two or more partners in the past year.

***There is no consistent pattern of change between 1995 and 2000 in monogamy among all sexually experienced and all currently married women and men.*** In both 1995 and 2000, no more than 9% of women in any age-group reported that they had had two or more sexual partners in the past year, compared with 8-23% of men; overall, 3-4% of all sexually experienced women and 14% of all sexually experienced men reported more than one sexual partner in the past year (Table 3, Panel 1, Women and Men). The proportion of all married women and men who had had two or more sexual partners in the past year changed little for most age-groups between 1995 and 2000.

Considering the sexually experienced population (Table 3, Panel 1, Women and Men), exceptions to these findings include women 15-17, who experienced a decline from 8% in 1995 to 4% in 2000 in the proportion who had two or more partners in the past year, and men 45-49, who experienced a decline from 11% to 6%. An exceptional increase—from 13% to 20%—was reported by men 25-29.

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<sup>3</sup> The 1988 survey of women did not obtain information on number of sexual partners.

<sup>4</sup> When the number of respondents in the denominator is small (less than 25 cases), age groups are combined to increase the stability of the estimates. This became necessary for some groups in the analyses presented in tables 3-7.

<sup>5</sup> Unmarried includes both never-married and formerly married people.

Currently married women and men show levels and patterns in the proportion with two or more sexual partners in the past year similar to those for all sexually experienced people, as would be expected, since they make up the overwhelming majority of women and men aged 15-49 (88% and 83%, respectively, in 2000). The proportion of married women aged 15-17 who had had two or more partners in the past year decreased from 9% in 1995 to 4% in 2000 (Table 3, Panel 2, Women). Currently married 18-19-year-old men report a large increase in the proportion with multiple sexual partners, from 16% in 1995 to 25% in 2000<sup>6</sup>; however, among most other age-groups of married men small declines are reported (Table 3, Panel 2, Men).

### 3. Condom use

Despite their limitations, available data on condom use provide an indication of trends in this protective behavior and allow us to gauge its potential for contributing to overall trends in HIV prevalence and incidence. We present measures for the total sexually active population and for married and unmarried women and men separately; however, we focus the discussion on trends among the unmarried because their higher proportions with two or more sexual partners in a recent one-year period increase their risk for HIV infection.

The measures of condom use presented here are taken from different series of questions asked of women and men in the DHS surveys. In all cases, the purpose is to have measures that are comparable across surveys. Information on ever use of the condom is available for both women (all three survey years) and men (the recent two survey years). However, the measure of recent use of a condom differs for men and women. For women, two measures of use in the current period are available: The first is taken from a question that asked about current use of condoms for pregnancy prevention; the second uses additional data obtained in the context of questions on STD/HIV risk and is based on a question that was open-ended and did not specify the reason for using the condom, which implied that it included use for STD/HIV prevention.<sup>7</sup> For men, only one comparable measure, which is somewhat different from the measures for women, is available for both survey years (1995 and 2000); it is available from a question that asked about use of a condom at last intercourse within the year before the survey, with no specification of the reason for use, implying that use for either STD/HIV or pregnancy prevention or both are included. Thus, the period is more extensive compared to women – for men the measure is for last intercourse in the recent one year period, and it is based on men who were sexually active in the past year; for women, it is a current status measure, and results presented are based on women who were sexually active in the three months before interview.

***Ever use of a condom increased steeply between 1988 and 2000 among both women and men.*** The proportions of sexually experienced women and men who had ever used a

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<sup>6</sup> Despite its large size, this result is probably not significant because of small sample size: the unweighted number of married 18-19-year-old men straddles our cutoff sample size of 25 cases (there are 27 respondents in 1995 and 24 in 2000).

<sup>7</sup> For women, current use of the condom (for pregnancy prevention purposes) was obtained from the question: “Are you currently doing something or using any method to delay or avoid getting pregnant?” “Current” is not defined with any more preciseness than this, and there is therefore some ambiguity in what period women were thinking of when they reported current use: It may have been the current month, or the recent few months. In the most recent two surveys (1995 and 2000), additional questions were asked on ever use of the condom for STD prevention, and on use of the condom at last intercourse for any reason, including both STD prevention and pregnancy prevention.

condom increased greatly, as reported by women over the period 1988-2000, and by men, for the period 1995-2000 (Table 4, Panel 1; Table 5, Panel 1). The level of use reported by women is much lower than that reported by men, 15% of sexually experienced women aged 15-49 in 2000 compared with 41% of men. This pattern has been observed in many countries, due partly to underreporting of condom use by women and partly to men's reporting condom use with partners other than their wives. Despite the difference between men and women in reported levels of use, the patterns of large increases in condom use over the past decade are similar for women and men.

***Use of condoms rose between 1995 and 2000 among all sexually active women and men, especially among younger women and men.*** The proportion of sexually active women who reported condom use for any reason, including pregnancy prevention increased from 3% to 6% overall, but from 6% to 25% for women 15-17 and from 3% to 12% among 18-19-year-olds (Table 4, Panel 3; Figure 10). Among all men who were sexually active during the past year, use of a condom at last intercourse increased from 9% to 15%, but among 15-17 year olds, it increased from 16% to 55%, and among men 18-19 and 20-24, from about 20% to roughly to 33% (Table 5, Panel 2; Figure 11).

***Current use of condoms was very low among married women and men, but increased slightly by 2000.*** The proportion of married women who reported current condom use (whether for pregnancy prevention or for other reasons such as STD/HIV prevention) ranged from 0-3% across subgroups in 1988, 1995 and 2000, though proportions increased very slightly between 1988 and 2000 (Table 6, Panels 1 and 2). Married men of all ages reported small increases in current use of condoms (measured as use at last intercourse in the past year) over the period for which information is available, from an overall level of 3% in 1995 to 5% in 2000 (Table 7, Panel 1).

***Condom use increased steeply among unmarried, sexually active women and men between 1988 and 2000.*** From negligible levels in 1988, current use of condoms for pregnancy prevention rose sharply among unmarried sexually active women between 1988 and 1995, from less than 1% to 16% and then increased further to 24% in 2000 (Table 6, Panel 3; Figure 12). However, while the level of condom use for pregnancy prevention rose steeply among adolescents and older adults (30-49 year-olds) between 1995 and 2000, it changed little for unmarried women aged 20-29. Data on use of condoms for any reason show a similar pattern of increase; the absolute size of the increase is somewhat larger, increasing over all ages from 23% in 1995 to 37% in 2000 (Table 6, Panel 4).

Unmarried men of all ages who had had sex in the past year reported very large increases in condom use between 1995 and 2000 (Table 7, Panel 2; Figure 13). The proportion who used a condom at last sex rose from 39% of unmarried, sexually active men aged 15-49 in 1995 to 57% in 2000. Increases were proportionally largest among adolescents.

## **Implications of Behavior Changes for Risk of HIV Infection**

The evidence from national surveys of men and women shows that changes in all three of the factors investigated—abstinence, monogamy and condom use— probably contributed to lower risk of HIV infection, at least for some women and men and some age- and marital groups.

Increased delay in initiation of sexual activity is a moderately important contributing factor to reduction in the risk of HIV infection. Adolescent women (aged 15-19) were less likely to have initiated sexual intercourse in 2000 than in 1988, as were older adolescent men (18-19) over the period 1995-2000. However, when all persons of reproductive age are taken into consideration, this factor had only a moderate impact on the overall level of sexual exposure to the risk of HIV infection.

Other research has shown much sharper declines in sexual initiation among primary school pupils aged 13-16 in one district in Uganda (the Soroti District)<sup>xi</sup>; however, the national data indicate that such large declines did not occur in the country as a whole. It is possible that the greater behavior change in this district resulted from interventions particular to this district; in addition, in general, adolescents attending school may be more exposed to educational interventions than the average adolescent, and more likely to change their behavior in response to such interventions.

Abstinence among those who had ever been sexually active is not a significant factor in reducing exposure to HIV infection over the time periods covered by the DHS data. Those adolescents and young adults who have had sexual intercourse are increasingly unmarried (and are more likely than older adults to be exposed to multiple sexual partners), somewhat countering the impact of reduction in risk from later onset of sexual intercourse. The proportion of sexually experienced people who were sexually active at the time of the survey hardly changed for women, except those aged 15-17, and actually increased among men, potentially increasing their risk for HIV infection.

The net impact of changes in initiation of sexual intercourse and of abstinence among those who have had sex is reflected in the proportion of women and men who were sexually active in the three months before each survey period. This measure indicates a decrease in ongoing levels of exposure to HIV risk among women aged 15-17, but little change for most older women and increased exposure among men in most age- groups.

Increased monogamy, especially among unmarried women, is a contributing factor for the period 1995-2000. This increase reduced the risk for HIV infection among younger married women and among unmarried, sexually active women at all ages. Overall, however, there has been relatively little change in the proportions monogamous among sexually active men, regardless of age and marital status.

Increased use of the condom among the unmarried sexually active population, both men and women, is a significant contributing factor to the reduction in HIV risk (based on

information for the period 1988-2000 for women; and for the period 1995-2000 for men). While married men also report a small increase in current use of condoms, there was little change in the level of use reported by married women. Information on consistency and correctness of use is not available from national surveys.

## **Implications for Policy and Programs**

National evidence suggests that changes in all three areas that are targets of current HIV prevention efforts in Uganda (abstinence, behavior change (monogamy) and condom use) have likely contributed to the reduction in risk of HIV infection, and therefore to the decline in HIV prevalence. These results are consistent with the broad diversity of types of interventions and of groups and organizations that have been active in implementing interventions, and suggest that the current approach in Uganda—where a large number of organizations and groups implement a range of different policies and programs that together address all three of the main factors that influence HIV infection—is likely to be effective in reducing the prevalence of HIV. The size, and probable impacts, of changes in these factors differed by gender, age and marital status, and in many cases the changes were small. They were greatest among young women, especially those aged 15-17, and some groups of young men, suggesting perhaps that interventions have been differentially directed at them or have been more effective among this group, as well as that they have had a bigger potential for change because of their age and unmarried status. Relatively high levels of exposure to multiple sexual partners and low levels of condom use across all age-groups, however, indicate the need for continued education, service and other intervention efforts.

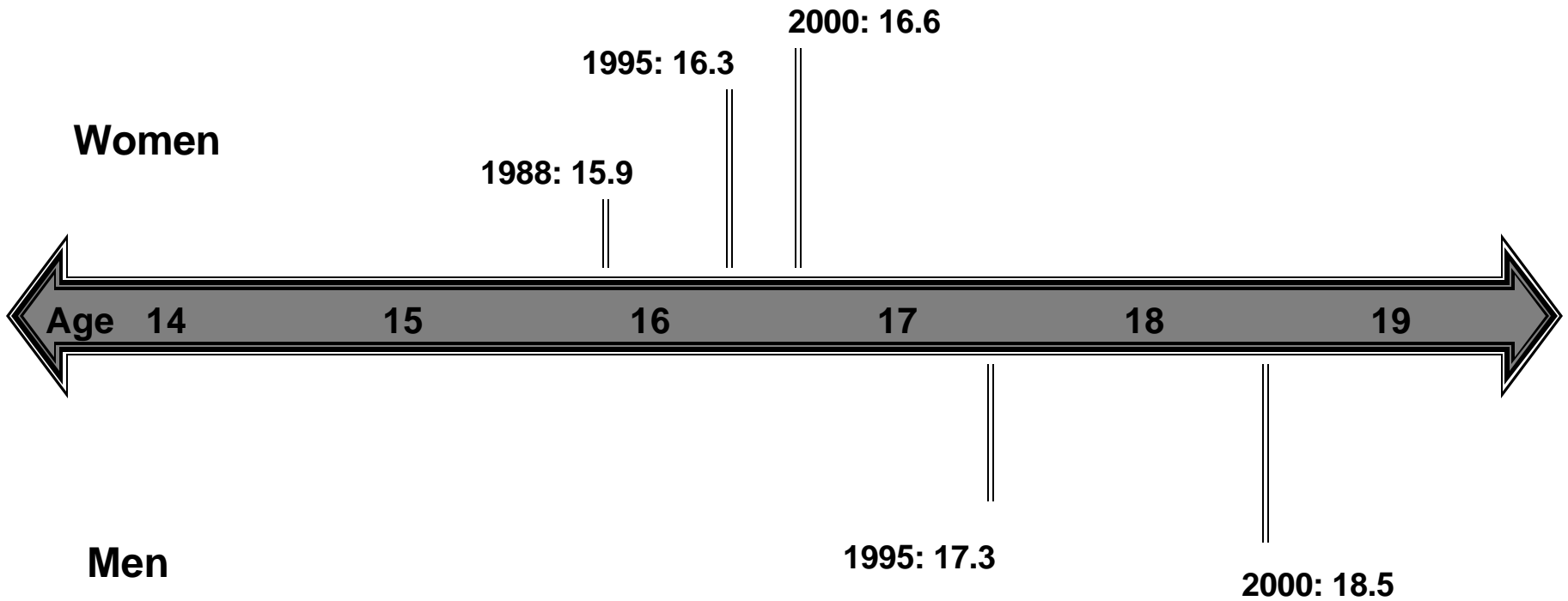
As one expert cautioned in a recent overview of the current understanding regarding HIV levels and trends in Uganda, “Another frequent mistake encountered is the notion that the decline in prevalence rates must be due to a few specific interventions introduced by the Ugandan government. ... the government is but one player in the fight against HIV-1. There are hundreds of non-governmental organizations (NGOs), religious groups and community activists also working to prevent the spread of HIV/AIDS in Uganda.”<sup>xii</sup> This article also points out that a key factor in the decline in prevalence of HIV in Uganda is the government's “uniquely creative and strategic policy approach to enable non-state actors in their individually targeted messages about prevention,” and specifically highlights the importance of the comprehensive approach implemented in Uganda.<sup>xiii</sup>

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- <sup>vi</sup> Allen A, Sex change; Uganda v. condoms, *New Republic*, May 27, 2002, pp. 14–15.
- <sup>vii</sup> Mbulaiteye SM et al., 2002, op. cit (see reference 4); and Zaba B, Boerma T and White R, 2000, op. cit. (see reference 2).
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- <sup>x</sup> United Nations, *HIV/AIDS and Fertility in Sub-Saharan Africa: A review of the research literature*, New York, United Nations, April 2002, ESA/P/WP.174.
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- <sup>xii</sup> Parkhurst JO, 2002, op. cit. (see reference 1).
- <sup>xiii</sup> Ibid.

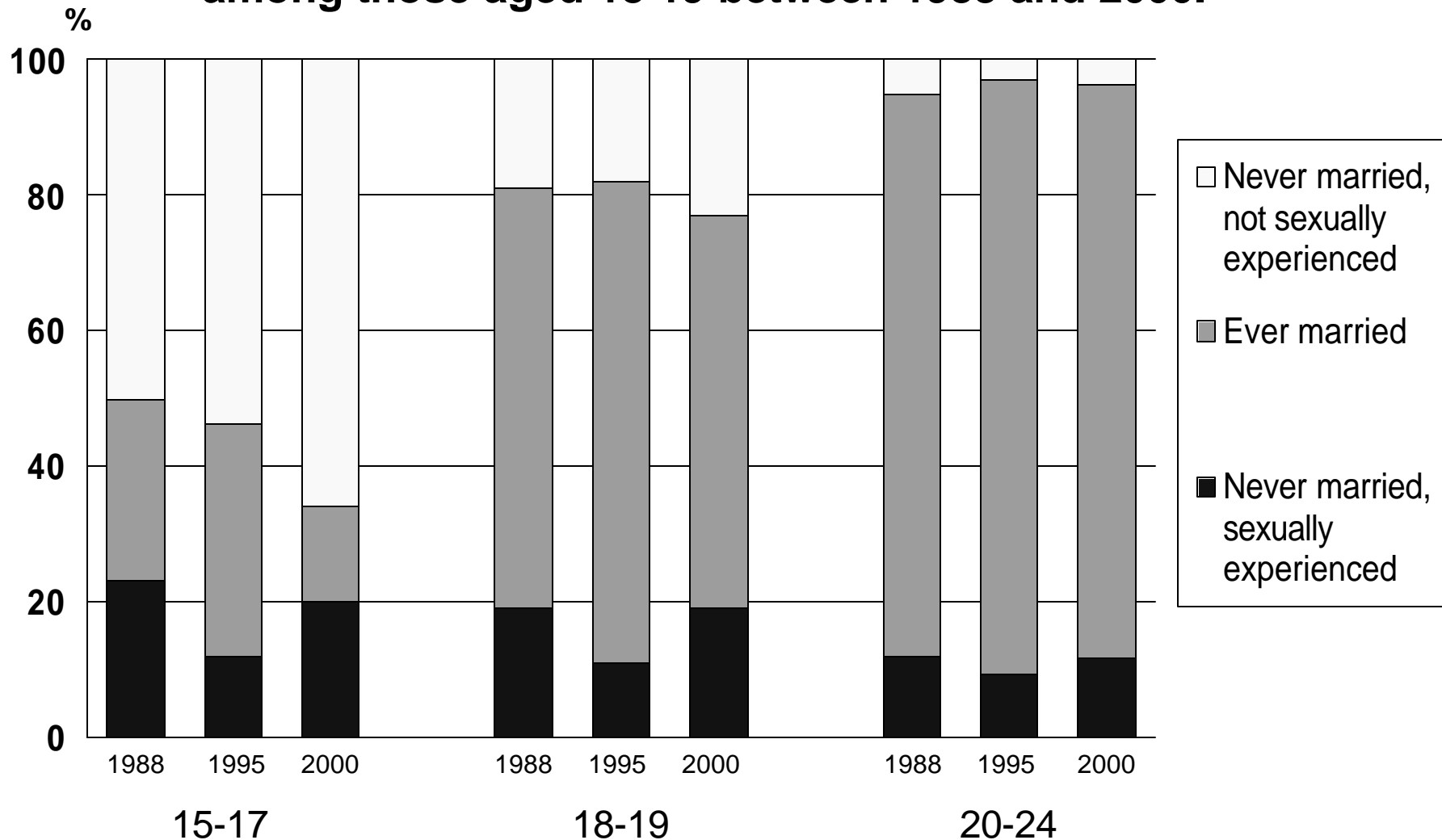
**The role of behavior change  
in the decline in HIV prevalence  
in Uganda**

**Figures**

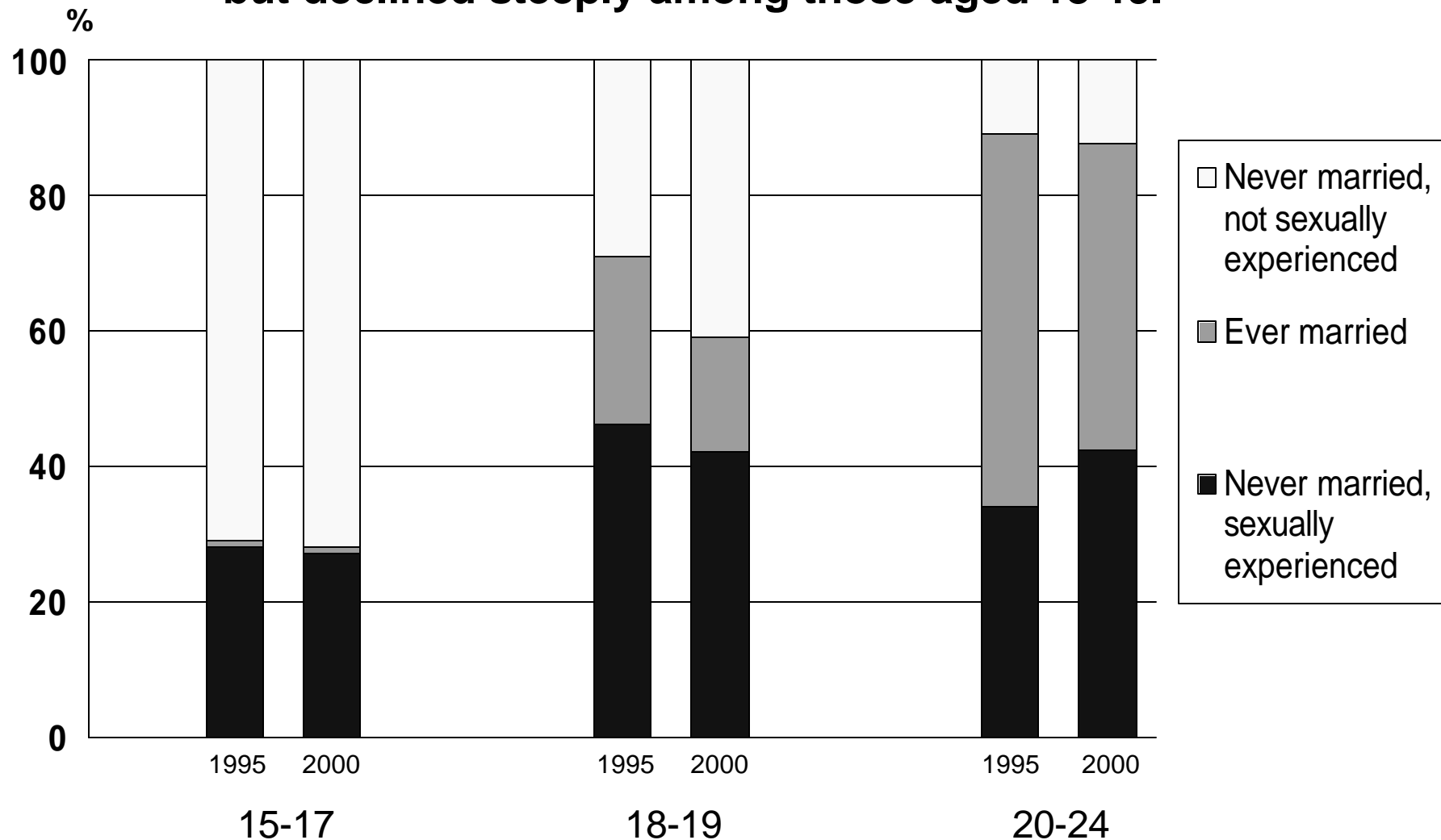
**Figure 1. The median age at first sexual intercourse has risen for both women and men in Uganda.**



**Figure 2. The proportion of women who were sexually experienced declined steeply among those aged 15-17 and decreased slightly among those aged 18-19 between 1988 and 2000.**

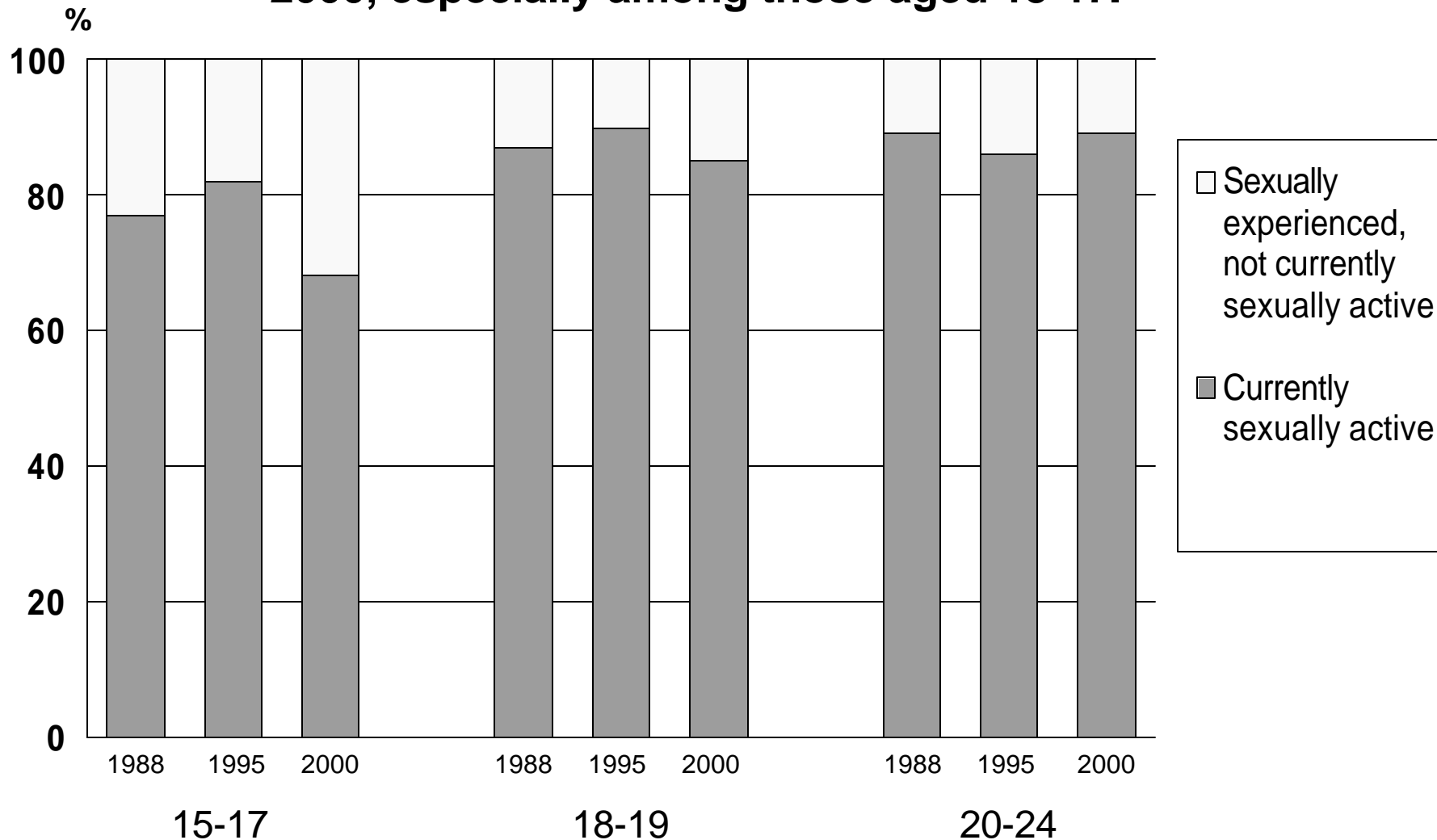


**Figure 3. The proportion of men who were sexually experienced changed little between 1995 and 2000 among those aged 15-17, but declined steeply among those aged 18-19.**

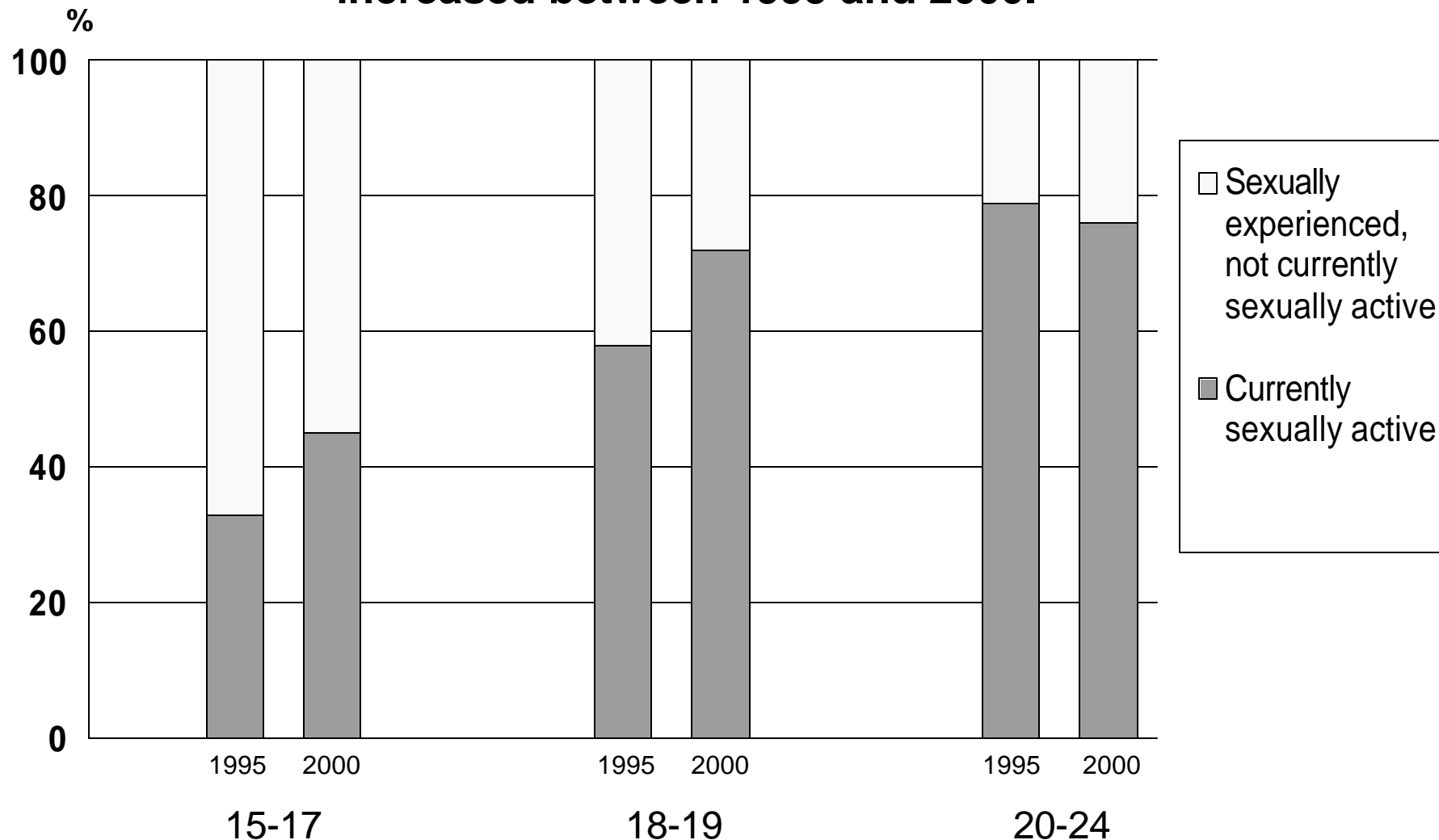


Tabulations from Uganda DHS Surveys, 1995 and 2000.

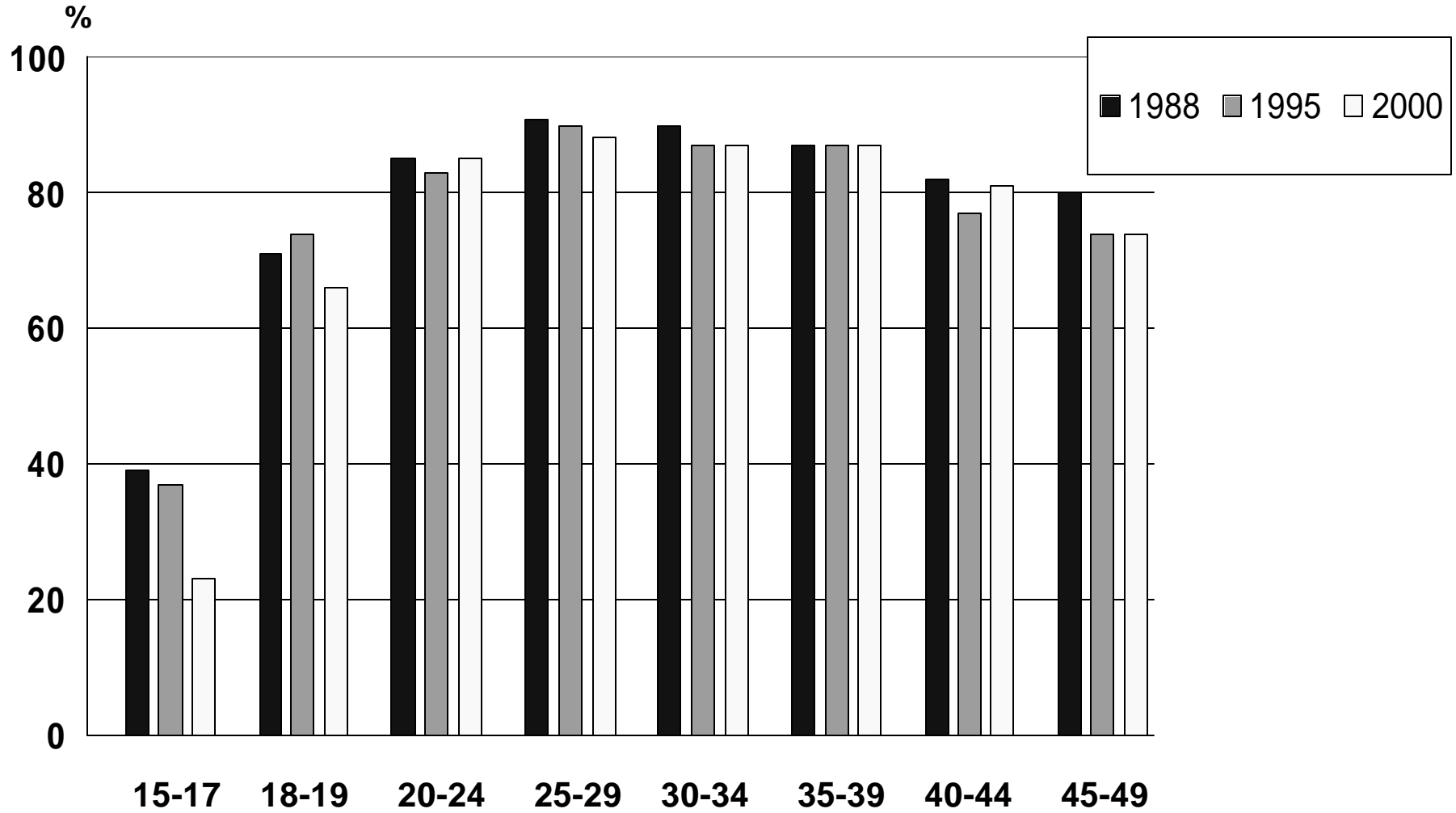
**Figure 4. The proportion of sexually experienced adolescent women who were currently sexually active decreased in 2000, especially among those aged 15-17.**



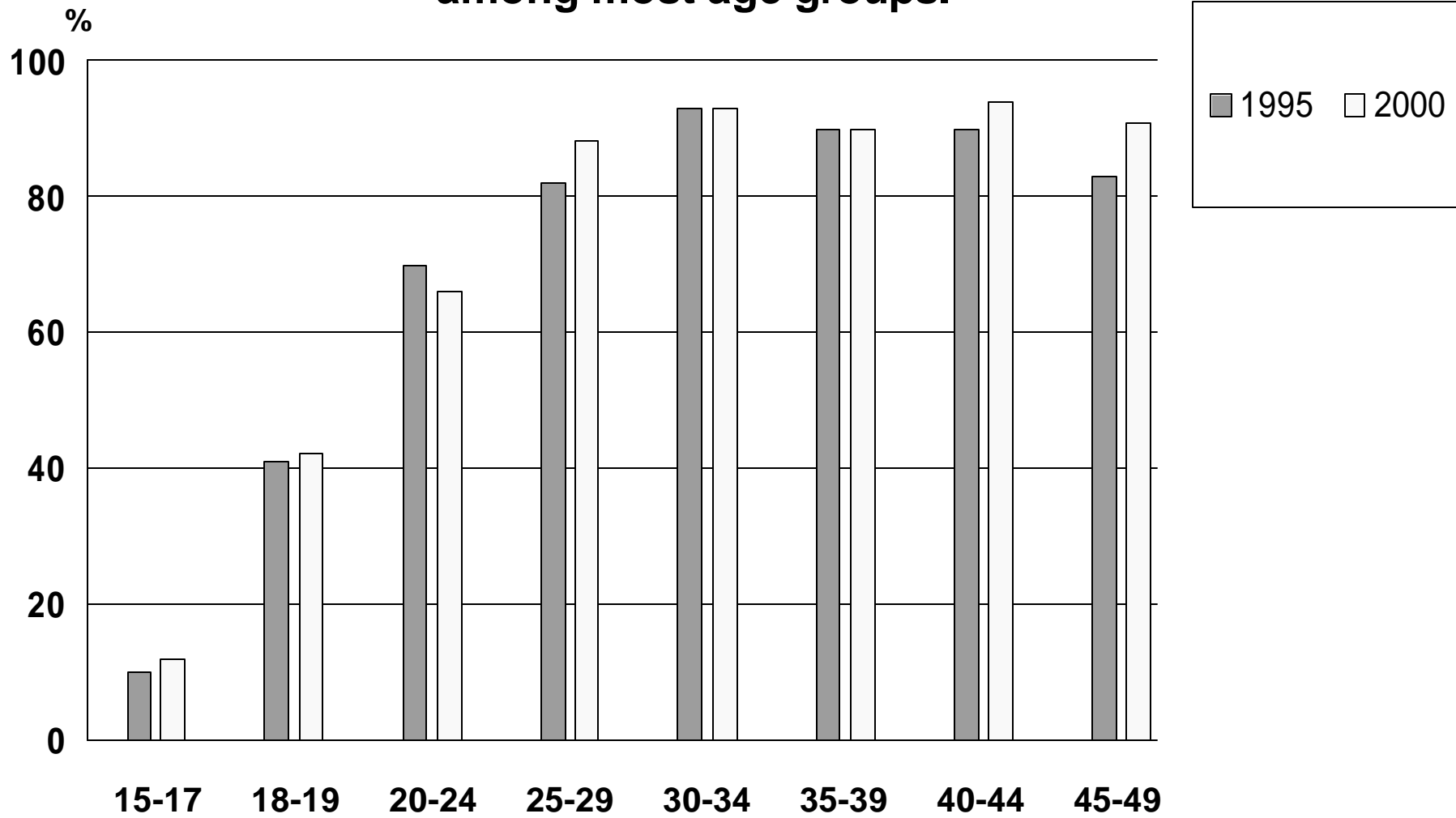
**Figure 5. The proportion of sexually experienced adolescent men who were currently sexually active increased between 1995 and 2000.**



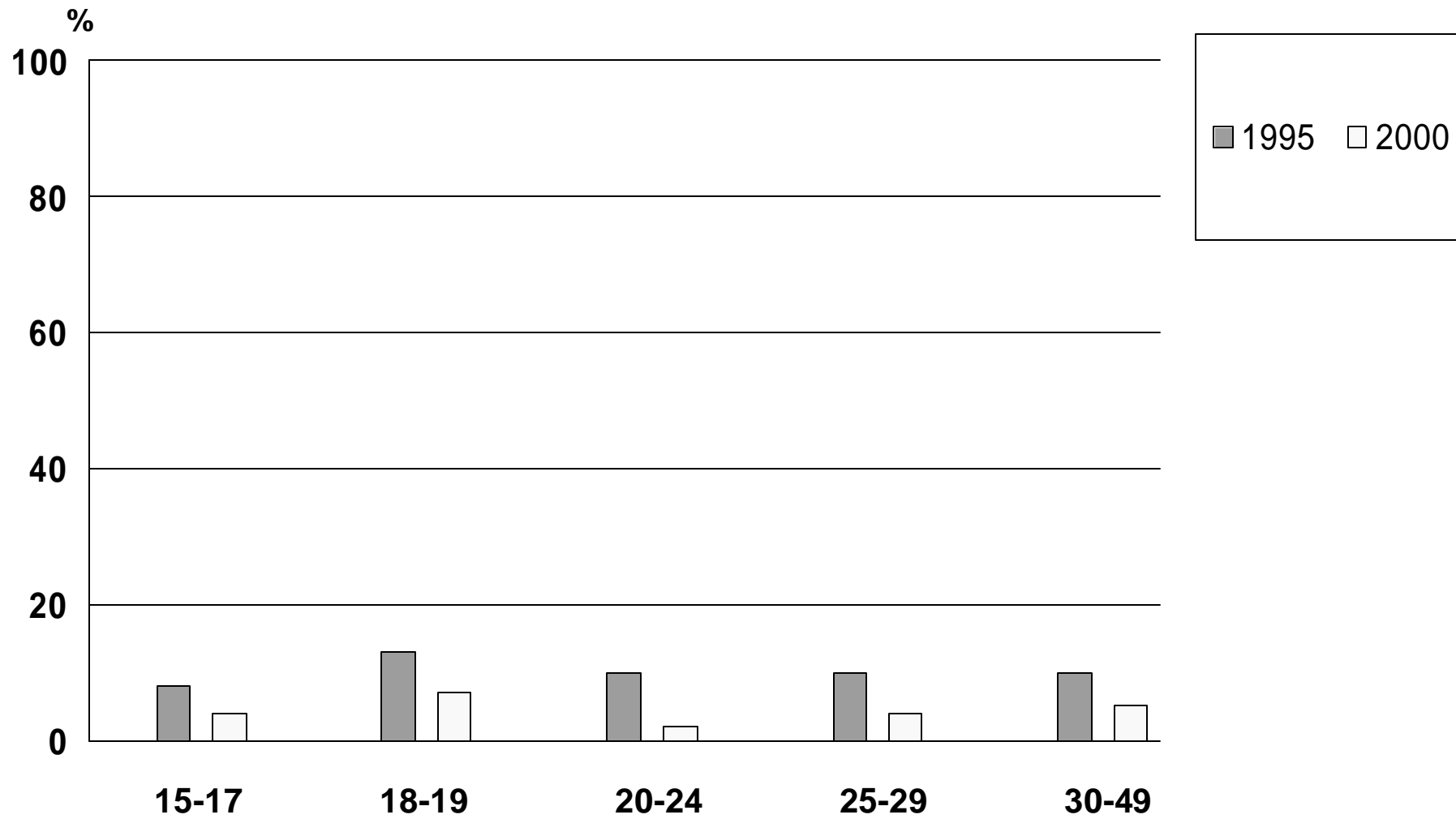
**Figure 6. The proportion of all women who were currently sexually active decreased in 2000 among adolescents, especially those aged 15-17, but not among most older women.**



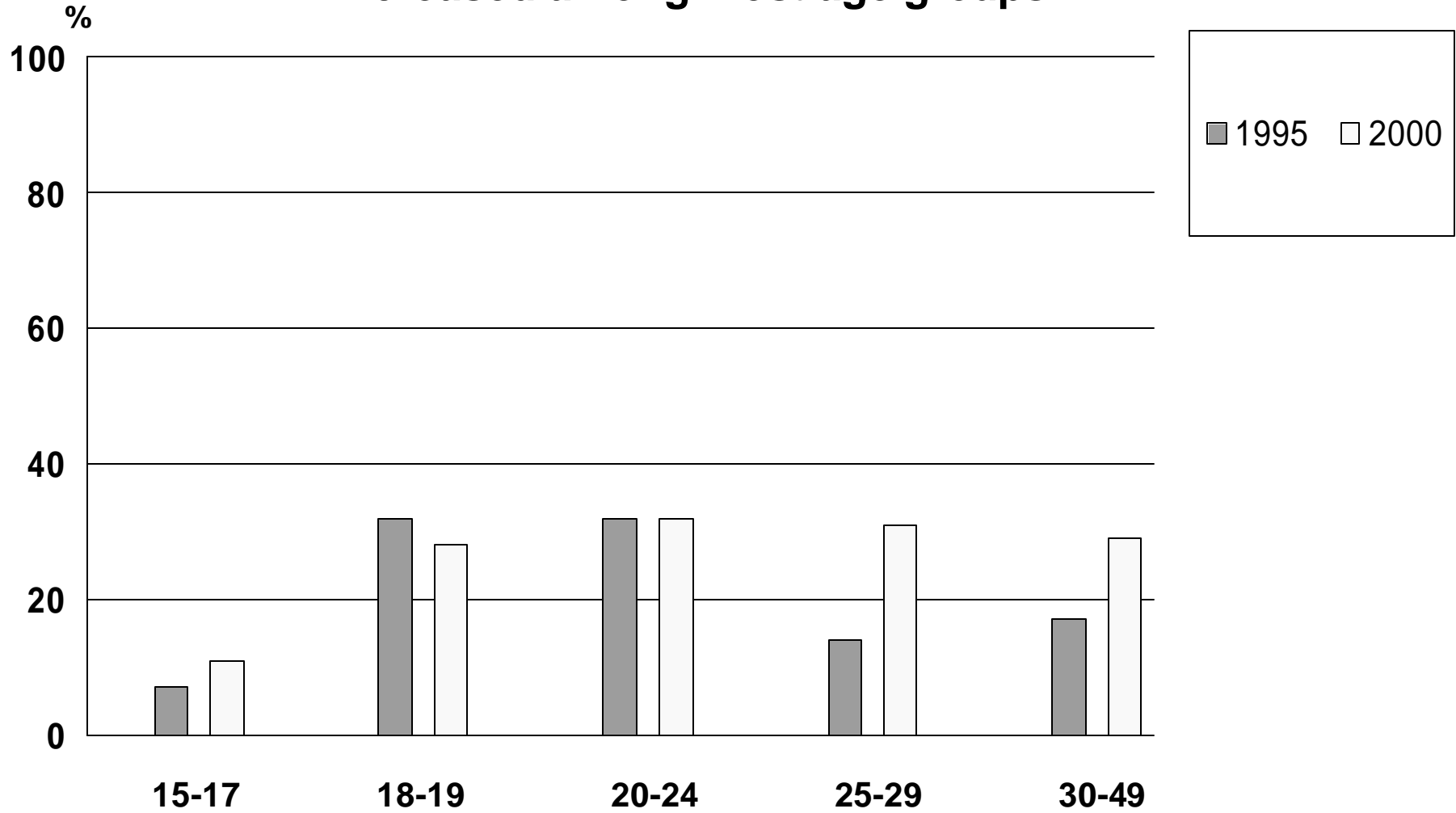
**Figure 7. The proportion of all men who were currently sexually active changed little between 1995 and 2000 among most age-groups.**



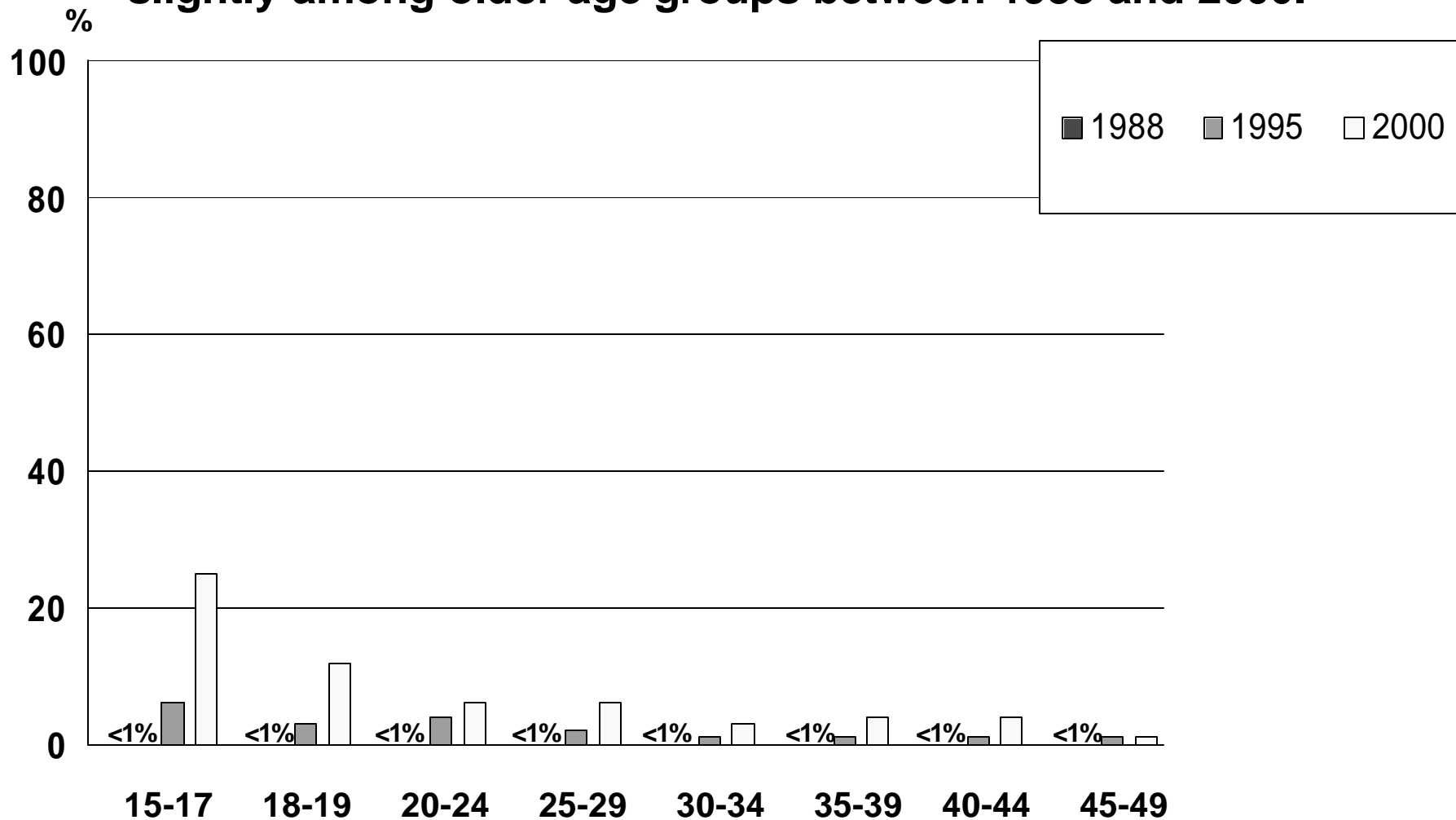
**Figure 8. Among unmarried women who were sexually active in the past year, the proportion who had two or more partners decreased between 1995 and 2000 at all ages.**



**Figure 9. Among unmarried men who were sexually active in the past year, the proportion who had two or more partners increased among most age-groups.**

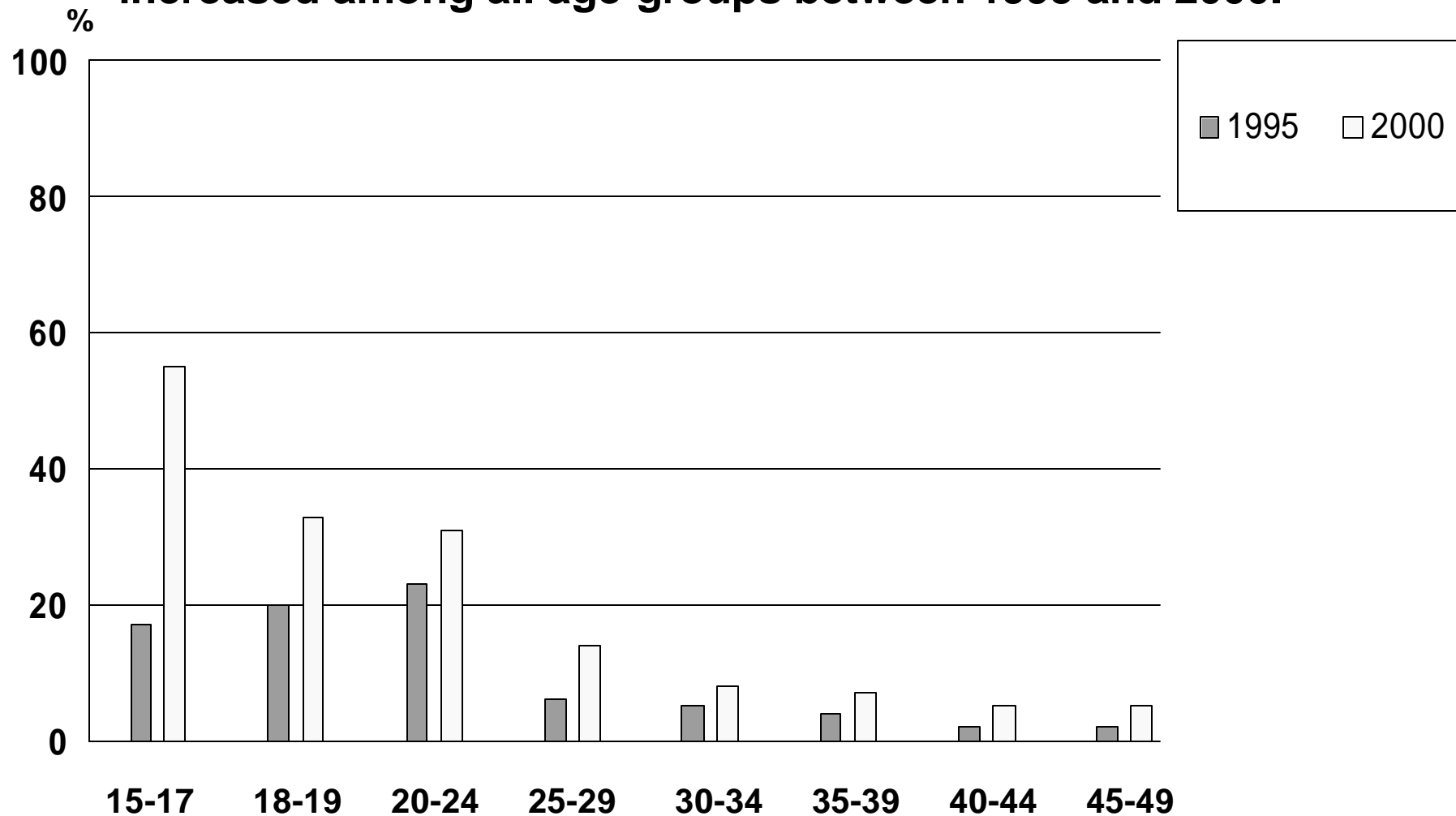


**Figure 10. The proportion of all sexually active women using condoms increased steeply among adolescents and increased slightly among older age-groups between 1988 and 2000.**

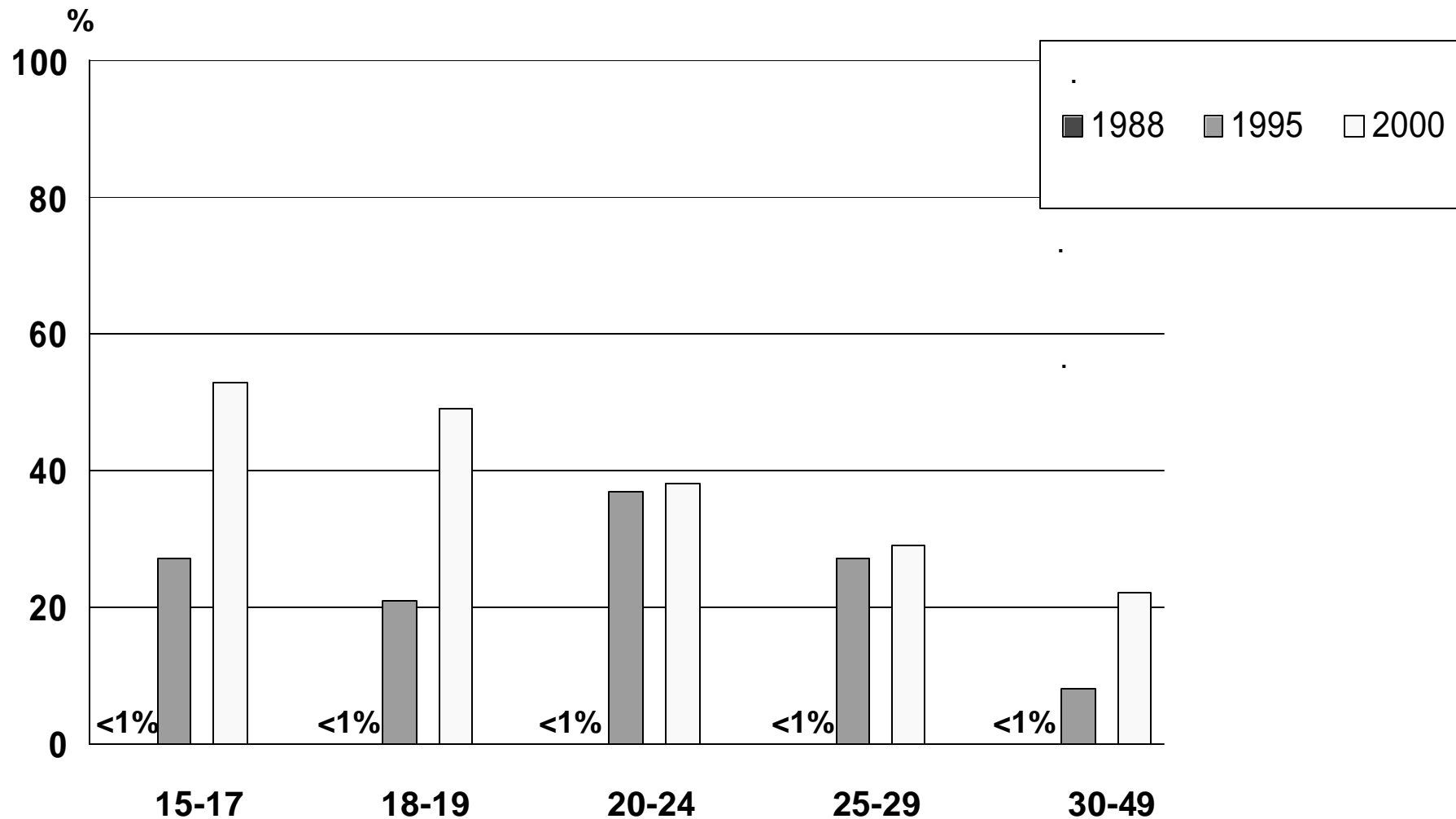


Tabulations from Uganda DHS Surveys, 1988, 1995 and 2000.

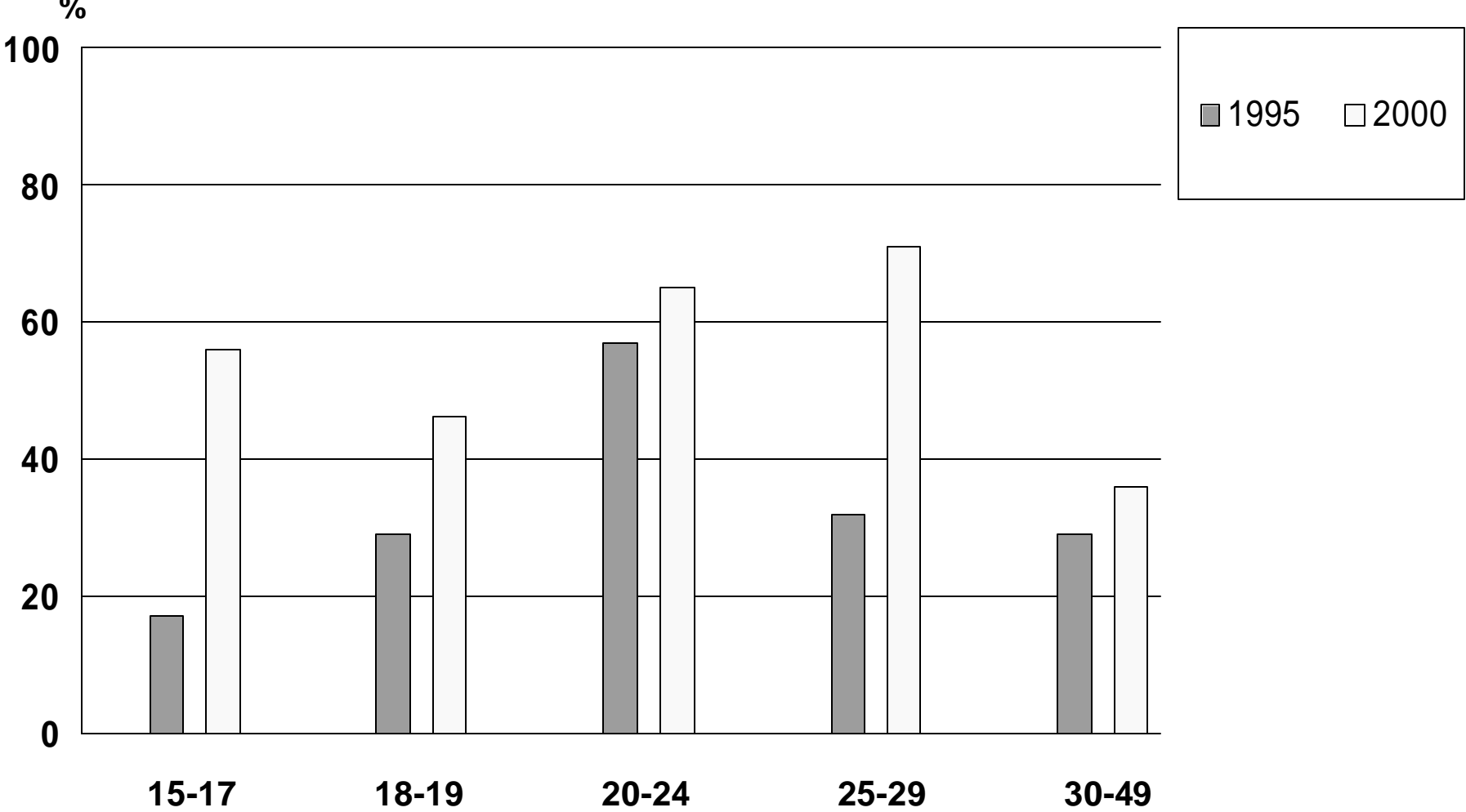
**Figure 11. Among men who were sexually active in the past year, the proportion who used condoms at last intercourse increased among all age-groups between 1995 and 2000.**



**Figure 12. The proportion of unmarried, sexually active women using condoms for any reason increased steeply among adolescents and women aged 30-49 between 1995 and 2000.**



**Figure 13. Among unmarried men who were sexually active in the past year, the proportion who used condoms at last intercourse increased substantially among adolescents and those 25-29 between 1995 and 2000.**



**Table 1. Among Ugandan women and men aged 15-49, percentage who were sexually experienced and percentage who had ever married,<sup>a</sup> percentage of those who had never married who were sexually experienced and percentage of all women and men who were sexually experienced and had never married, by gender and age-group, Demographic and Health Surveys, 1988-2000**

**A. WOMEN**

	Percentage of all women who were sexually experienced			Percentage of all women who had ever married			Percentage of never-married women who were sexually experienced			Percentage of all women who were sexually experienced and had never married		
	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	50	46	34	27	34	14	32	19	23	23	12	20
18-19	81	82	77	62	71	58	50	38	46	19	11	19
20-24	95	97	96	83	88	85	72	76	76	12	9	12
25-29	99	99	99	96	94	94	78	82	90	4	5	6
30-49	100	100	100	99	99	98	62	86	78	1	1	1
30-34	100	100	100	98	98	97	ns	ns	ns	2	2	2
35-39	99	100	100	99	99	98	ns	ns	ns	0	1	2
40-44	99	100	100	99	100	100	ns	ns	ns	0	1	1
45-49	100	100	100	99	99	100	ns	ns	ns	1	1	1
Total	89	90	88	81	84	78	45	38	47	9	6	10

**B. MEN**

Age	Percentage of all men who were sexually experienced			Percentage of all men who had ever married			Percentage of never-married men who were sexually experienced			Percentage of all men who were sexually experienced and had never married		
	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	na	29	27	na	1	1	na	28	27	na	28	27
18-19	na	71	59	na	25	17	na	61	50	na	46	42
20-24	na	89	88	na	55	45	na	76	77	na	34	42
25-29	na	98	98	na	83	83	na	89	89	na	15	15
30-49	na	99	100	na	97	96	na	79	95	na	2	4
30-34	na	100	100	na	97	95	na	ns	ns	na	3	5
35-39	na	99	99	na	97	96	na	ns	ns	na	2	4
40-44	na	99	100	na	99	96	na	ns	ns	na	1	4
45-49	na	98	100	na	97	97	na	ns	ns	na	1	4
Total	na	86	83	na	69	64	na	56	53	na	18	19

\* Marriage is defined broadly and includes legal marriage and living together; Notes: na = not available; ns = not shown because of small sample size.

Source of Table 1 and all subsequent tables: Macro International, Inc and Uganda: Demographic and Health Surveys for 1988 (women only), 1995 and 2000.

**Table 2. Percentage of sexually experienced Ugandan women and men who had never married and percentage who were currently in a sexual relationship, and percentage of all women and men who were currently in a sexual relationship, by gender and age group, 1988-2000**

**A. WOMEN**

Age	Percentage of sexually experienced women who had never-married			Percentage of sexually experienced women currently in a sexual relationship*			Percentage of all women currently in a sexual relationship*		
	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	46	27	59	77	82	68	39	37	23
18-19	23	13	25	87	90	85	71	74	66
20-24	13	10	12	89	86	89	85	83	85
25-29	4	5	6	92	91	88	91	90	88
30-34	2	2	2	90	87	88	90	87	87
35-39	0	1	2	88	87	88	87	87	87
40-44	0	1	1	83	77	81	82	77	81
45-49	1	1	1	80	74	74	80	74	74
Total	10	7	12	87	86	85	78	78	75

**B. MEN**

Age	Percentage of sexually experienced men who had never-married			Percentage of sexually experienced men currently in a sexual relationship*			Percentage of all men currently in a sexual relationship*		
	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	na	96	98	na	33	45	na	10	12
18-19	na	65	71	na	58	72	na	41	42
20-24	na	38	48	na	79	76	na	70	66
25-29	na	16	15	na	84	90	na	82	88
30-34	na	3	5	na	93	93	na	93	93
35-39	na	2	4	na	91	90	na	90	90
40-44	na	1	4	na	90	94	na	90	94
45-49	na	1	4	na	86	91	na	83	91
Total	na	20	23	na	83	85	na	71	71

\* Currently in a sexual relationship is defined as currently married or unmarried, and had sex in the last three months.

Note: na = not available.

**Table 3. Percentage of all sexually experienced Ugandan women and men, percentage of currently married women and men and percentage of unmarried, sexually active women and men who had two or more partners in the past year, by gender and age-group, 1995 and 2000**

**A. Women**

Age	Percentage of sexually experienced women who had 2+ partners in the past year		Percentage of currently married women who had 2+ partners in the past year		Percentage of unmarried women who were sexually active in the past year who had 2+ partners in the past year	
	1995	2000	1995	2000	1995	2000
15-17	8	4	9	4	8	4
18-19	4	4	3	3	13	7
20-24	3	3	3	3	10	2
25-29	3	3	3	3	10	4
30-49					10	5
30-34	3	2	3	2	ns	ns
35-39	5	3	5	3	ns	ns
40-44	3	2	4	2	ns	ns
45-49	1	1	2	2	ns	ns
Total	4	3	4	3	10	4

**B. Men**

Age	Percentage of sexually experienced men who had 2+ partners in the past year		Percentage of currently married men who had 2+ partners in the past year		Percentage of unmarried men who were sexually active in the past year who had 2+ partners in the past year	
	1995	2000	1995	2000	1995	2000
15-17	8	8	na	na	7	11
18-19	21	22	16	25	32	28
20-24	23	20	18	14	32	32
25-29	13	20	15	19	14	31
30-49					17	29
30-34	13	12	13	12	ns	ns
35-39	11	10	11	10	ns	ns
40-44	10	9	10	8	ns	ns
45-49	11	6	12	5	ns	ns
Total	14	14	13	12	24	27

Note: ns = not shown because of small sample size.

**Table 4. Percentage of sexually experienced Ugandan women who had ever used a condom; percentage of currently sexually active women currently using condoms for pregnancy prevention and percentage using condoms for any reason, by age group, 1988-2000**

Age	Percentage of sexually experienced women who had ever used a condom			Percentage of sexually active* women currently using condoms for pregnancy prevention <sup>a</sup>			Percentage of sexually active* women currently using condoms for any reason <sup>a</sup>		
	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	3	14	31	<1	4	18	na	6	25
18-19	3	13	26	<1	2	8	na	3	12
20-24	3	12	20	<1	3	4	na	4	6
25-29	3	11	16	<1	2	4	na	3	6
30-34	4	9	11	<1	1	2	na	2	3
35-39	8	6	9	<1	1	2	na	1	4
40-44	3	5	6	<1	<1	3	na	1	4
45-49	<1	2	4	<1	<1	<1	na	1	1
Total	3	10	15	<1	2	4	na	3	6

\* Sexually active is defined as currently married or unmarried, and had sex in the last three months Note: na=not available

<sup>a</sup> Use of condoms for pregnancy prevention comes from the series of questions asked in the section of the interview that addresses contraceptive knowledge and use; a second more inclusive measure of use of condoms was obtained in the 1995 and 2000 surveys only. Panel 3 shows results of this additional measure "The last time you had sexual intercourse was a condom"

**Table 5. Percentage of sexually experienced Ugandan men who had ever used a condom and percentage of men sexually active during the past year who used a condom at last intercourse, by age-group, 1995 and 2000**

Age	Percentage of sexually experienced men who ever used a condom		Percentage of men who were sexually active in the past year who used a condom at last intercourse <sup>a</sup>	
	1995	2000	1995	2000
15-17	25	42	16	55
18-19	39	46	20	33
20-24	44	62	23	31
25-29	28	49	6	14
30-34	23	39	5	8
35-39	20	30	4	7
40-44	15	21	2	5
45-49	16	15	2	5
Total	26	41	9	15

<sup>a</sup> Information is available from a question on use of a condom at last intercourse in the past year: "The last time you had sexual intercourse was a condom used?"

**Table 6. Percentage of Ugandan women currently using condoms by marital status and reason for use, according to age-group, 1988-2000**

Age	Married						Unmarried <sup>*</sup>					
	Pregnancy prevention <sup>a</sup>			Any reason <sup>a</sup>			Pregnancy prevention <sup>a</sup>			Any reason <sup>a</sup>		
	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	<1	1	2	na	2	2	<1	22	36	na	27	53
18-19	<1	1	2	na	2	2	<1	10	32	na	21	49
20-24	<1	1	2	na	2	3	<1	28	26	na	37	38
25-29	<1	1	3	na	2	3	<1	15	19	na	27	29
20-29	<1	1	3	na	2	3	<1	22	23	na	32	35
30-49	<1	1	1	na	1	2	<1	5	13	na	8	22
30-34	<1	1	1	na	2	2	<1	ns	ns	na	ns	ns
35-39	<1	1	2	na	2	2	<1	ns	ns	na	ns	ns
40-44	<1	<1	3	na	1	3	<1	ns	ns	na	ns	ns
45-49	<1	<1	<1	na	1	1	<1	ns	ns	na	ns	ns
Total	<1	1	2	na	2	3	<1	16	24	na	23	37

\* Includes those sexually active in past three months; Notes: na=not available; ns = not shown because of small sample size.

<sup>a</sup> Use of condoms for pregnancy prevention comes from the series of questions asked in the section of the interview that addresses contraceptive knowledge and use; a second more inclusive measure of use of condoms was obtained in the 1995 and 2000 surveys only. Panels 2 and 4 show results of this additional measure: "The last time you had sexual intercourse was a condom used?"

**Table 7. Percentage of Ugandan men who used a condom at last intercourse in the past 12 months,<sup>a</sup> by marital status, according to age-group, 1995 and 2000**

Age	Married		Unmarried*	
	1995	2000	1995	2000
15-17	ns	ns	17	56
18-19	7	10	29	46
20-24	4	7	57	65
25-29	2	4	32	71
20-29	3	5	50	67
30-49	2	4	29	36
30-34	2	4	ns	ns
35-39	3	6	ns	ns
40-44	2	4	ns	ns
45-49	<1	3	ns	ns
Total	3	5	39	57

\* Includes those sexually active in past year; Note: ns = not shown because of small sample size

<sup>a</sup> Information is available from a question on use of a condom at last intercourse in the past year: "The last time you had sexual intercourse was a condom used?"

Appendix Table 1. Unweighted number of respondents by gender, marital status and sexual activity status, according to age-groups, Uganda DHS, 1988-2000

## A. WOMEN

Age at survey	Total Number			Number currently married			Number currently unmarried			Number unmarried and sexually active during past year			Number unmarried and sexually active in past three months		
	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	706	936	986	145	259	110	561	677	876	157	107	195	115	65	108
18-19	493	688	701	256	428	347	237	260	354	99	78	168	78	56	104
20-24	982	1,567	1,542	682	1,174	1,132	300	393	410	185	150	278	133	101	162
25-29	1,068	1,323	1,326	856	1,065	1,034	212	258	292	134	121	205	103	88	119
30-49	1,481	2,556	2,691	1,116	1,977	2,052	365	579	639	195	146	303	142	103	154
30-34	538	987	955	430	799	759	108	188	196	72	64	114	53	42	56
35-39	410	743	783	298	599	609	112	144	174	64	37	99	52	28	54
40-44	246	475	547	178	336	405	68	139	142	32	27	57	19	19	29
45-49	287	351	406	210	243	279	77	108	127	27	18	33	18	14	15
Total	4,730	7,070	7,246	3,055	4,903	4,675	1,675	2,167	2,571	770	602	1,149	571	413	647

## B. MEN

Age at survey	Total Number			Number currently married			Number currently unmarried			Number unmarried and sexually active during past year			Number unmarried and sexually active in past three months		
	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000	1988	1995	2000
15-17	na	205	277	na	2	1	na	203	276	na	40	56	na	17	32
18-19	na	170	163	na	27	24	na	143	139	na	67	55	na	41	45
20-24	na	379	337	na	176	140	na	203	197	na	130	128	na	87	81
25-29	na	381	315	na	283	239	na	98	76	na	50	52	na	36	33
30-49	na	772	791	na	675	693	na	97	98	na	49	59	na	27	40
30-34	na	256	283	na	223	245	na	33	38	na	23	31	na	15	25
35-39	na	249	225	na	219	197	na	30	28	na	15	10	na	8	4
40-44	na	158	166	na	139	147	na	19	19	na	8	13	na	2	8
45-49	na	109	117	na	94	104	na	15	13	na	3	5	na	2	3
Total	na	1,907	1,883	na	1,163	1,097	na	744	786	na	336	350	na	208	231

Note: na = not available.