

2005

The changing context of sexual initiation in sub-Saharan Africa

Barbara Mensch
Population Council

Monica J. Grant

Ann K. Blanc

Follow this and additional works at: https://knowledgecommons.popcouncil.org/departments_sbsr-pgy



Part of the [Demography, Population, and Ecology Commons](#), [Family, Life Course, and Society Commons](#), and the [International Public Health Commons](#)

How does access to this work benefit you? Let us know!

Recommended Citation

Mensch, Barbara, Monica J. Grant, and Ann K. Blanc. 2005. "The changing context of sexual initiation in sub-Saharan Africa," Policy Research Division Working Paper no. 206. New York: Population Council. Version of record: <https://doi.org/10.1111/j.1728-4457.2006.00147.x>

This Working Paper is brought to you for free and open access by the Population Council.

WORKING PAPER

The Changing Context of Sexual Initiation in Sub-Saharan Africa

**Barbara S. Mensch
Monica J. Grant
Ann K. Blanc**

2005 No. 206



One Dag Hammarskjold Plaza
New York, New York 10017 USA
www.popcouncil.org
pubinfo@popcouncil.org

This material may not be reproduced without written permission from the authors. For a list of Policy Research Division Working Papers, including those that are currently available for downloading in PDF format, see www.popcouncil.org/publications/wp/prd/rdwplist.html.

ISSN: 1554-8538

© 2005 The Population Council, Inc.

THE CHANGING CONTEXT OF SEXUAL INITIATION IN SUB-SAHARAN AFRICA

Barbara S. Mensch
Monica J. Grant
Ann K. Blanc

Barbara S. Mensch is Senior Associate and, at the time this analysis was conducted, Monica J. Grant was Staff Research Associate, Policy Research Division, Population Council, New York. Grant is now at the Population Studies Center, University of Pennsylvania. At the time this analysis was conducted, Ann K. Blanc was President, Blancroft Research International, New York. She is now Program Officer, the John D. and Catherine T. MacArthur Foundation.

This paper was presented at the International Union for the Scientific Study of Population Meeting, 19 July 2005, Tours, France.

Acknowledgments: Funding for this research was provided by the Hewlett Foundation and the Department for International Development, UK. The authors thank Shelley Clark, John Casterline, and John Bongaarts for their helpful comments. They also thank Cynthia Lloyd for her encouragement in producing this paper, which was motivated by research conducted for a National Academy of Sciences Panel Report that she edited, entitled *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*.

ABSTRACT

During the past 20 years, substantial reductions have occurred in the proportion of young women who report marrying as teenagers in sub-Saharan Africa. An oft-stated consequence of a delay in age at marriage is a rise in the proportion of young women who engage in premarital sex. This paper investigates the links between changing age at marriage and premarital sexual behavior in 27 sub-Saharan African countries in which Demographic and Health Surveys were conducted between 1994 and 2003. Using multiple-decrement life tables to examine the competing risks of premarital sex and marriage without prior sexual experience, we answer the largely unaddressed question of how reductions in the prevalence of early marriage have affected the likelihood of initiating premarital sex. Our analysis reveals that although the age of first sexual activity has either remained the same or increased, a shift in the context of sexual debut from marriage to before marriage has taken place in many countries. We assess whether the increase in the proportion of young women who report premarital sex is influenced by an increase in exposure resulting from delayed marriage or by an increase in the rate of premarital sex. The evidence on this point is mixed; in some settings greater exposure “explains” more of the increase, whereas in others an increased rate of premarital sex dominates.

In many developing countries, one rationale given by parents for encouraging a daughter's early marriage is to preserve her virginity prior to the wedding date. The longer the interval between the onset of menstruation and first union, the more time a young woman has in which she may bring "dishonor" to the family name. Indeed, in settings where arranged marriage is still common, parental involvement in spouse selection is justified by a concern that premarital sex is more likely to occur when the young woman is free to select potential partners for herself (UNICEF 2001).

During the past 20 years, substantial reductions have occurred in the proportion of young women who marry as teenagers in all regions of the developing world, with the exception of Latin America and the Caribbean. The numbers for Africa are compelling. According to retrospective analyses of the Demographic and Health Surveys (DHS), 37 percent of women aged 20–24 in eastern and southern Africa and 45 percent in western and middle Africa were married before their eighteenth birthday, compared with 53 percent and 58 percent of women aged 40–44 in those areas. Current-status data, which represent a smaller proportion of the region's population than do the DHS data, reveal the same pattern; whereas approximately 38 percent of 15–19-year-old girls were married in the 1970s and 1980s in eastern and southern Africa and 53 percent in western and middle Africa, 20 years later the proportions fell to 25 percent and 38 percent (Mensch et al. 2005).

A recent policy report on the consequences of later marriage in the developing world asserts that an increase in premarital sex "is the inevitable trade-off for all of the benefits of delayed marriage" (Cohen 2004:3). Is this really the case? Where teenage marriage has declined, has the proportion of young women reporting premarital sex risen in turn? If so, is the increase due to the greater period of exposure between puberty and marriage, or is it due to a rise in the likelihood of having sex, that is, to changing norms about the acceptability of having sex before marriage, which may have altered with globalization, in particular with exposure to Western media and popular entertainment? Alternatively, is the concern about an increase in the occurrence of premarital sex unwarranted? Has the decline in the proportion of young women who marry early had little effect on premarital sexual behavior? Even if the proportion of young women engaging in premarital sex is increasing, is one consequence of the postponement of marriage a rise in the overall age of sexual initiation among the current generation of young people?

Observers in the population field might be particularly interested in learning whether changes have occurred in the context of sexual initiation in sub-Saharan Africa for a number of reasons. One potential consequence of a rise in premarital sex is an increase in unwanted fertility.¹ A rise in the proportion of girls who engage in sex before marriage is also likely to lead to a higher rate of induced abortion, which in this region is frequently illegal and often unsafe. Furthermore, even if, as recent research has suggested (Clark 2004), sexual activity is greater among married than among unmarried adolescents, and even if those who are married engage in more unprotected sex, unmarried girls are more likely to have multiple partners, and more of these partners are likely to be overlapping. Both circumstances are risk factors for transmission of sexually transmitted infections (STIs) (Mensch et al. 2005). An increase in the number of sexually active young women has implications for reproductive health programs; yet, in much of sub-Saharan Africa, youth-serving family planning and other

reproductive health services are considered woefully inadequate. A review of reproductive health services for young people noted the “poor fit” between such programs and the needs of young people, which is not surprising in light of the ambivalence many adults express about the sexual activity of unmarried adolescents (Hughes and McCauley 1998).

In addition to its implications for reproductive health and behavior, change in the context of sexual initiation is of interest because of its potential significance for family dynamics and for spousal relations. A rise in premarital sex may be indicative of an erosion of a family’s control over its young people (Feyisetan and Pebley 1989). As we implied above, an increase in premarital sex is a likely consequence of the decline in arranged marriages. Although few data exist that document changes in the spouse-selection process in Africa, greater involvement of young people in choosing their partners apparently has taken place in settings for which data are available and where arranged marriages were common in the past (National Research Council 1993; Gage and Meekers 1995; Mensch 2005). The reduced involvement of kin in the marriage process undoubtedly alters the nature of the marital bond. The increase in premarital sex may have an effect on spousal relations, however, simply because the norms regarding sexual behavior within the society have changed. Indeed, sociologists examining the consequences of the timing of premarital intercourse for subsequent family formation among adolescents in the United States suggest that “sexual intercourse brings about fundamental changes in orientation to persons of the opposite sex” (Miller and Heaton 1991:720).

In this paper we investigate the links between changing age at marriage and premarital sexual behavior in sub-Saharan Africa using DHS data from 27 countries collected between 1994 and 2003. We review the limited literature on the association between rising age at marriage and premarital sex and briefly explain how our analytic strategy differs from that used in previous studies. We discuss data-quality issues that plague research of this type and provide an overview of trends in early marriage and premarital sex.

CHANGES IN EARLY MARRIAGE AND PREMARITAL SEX: PREVIOUS RESEARCH

One consequence of a decline in early marriage is widely assumed to be an increase in the occurrence of premarital sex if for no other reason than that the period during which girls are sexually mature and unmarried will have lengthened (AGI 1998; Bongaarts and Cohen 1998). As the authors of a review of trends in the last few decades of the twentieth century assert, “In every society, an important consequence of prolonging the period between puberty and marriage is an increased likelihood that young women will become involved in sexual relationships before marriage” (AGI 1995:1).

Numerous researchers have made this observation, whether writing about the developed or the developing world. Yet, to the best of our knowledge, no demographers have analyzed the association between changing patterns of marriage and the changing age and context of sexual initiation. Zaba and her colleagues’ (2004) recent examination of trends in age at first sex in six sub-Saharan African countries describes the amount of time spent in an unmarried sexually active state and whether it has changed over time. Their analysis is an epidemiological assessment of the risk of HIV transmission rather than a demographic

investigation of the effect of a delay in marriage on sexual initiation. Other studies have examined sexual activity among young people, typically modeling the determinants of sexual initiation (see, for example, Feyisetan and Pebley 1989; Rosero-Bixby 1991; Gage-Brandon and Meekers 1993; Meekers 1994; Ali and Cleland 2005). An extensive literature also exists on trends and differentials in age at first marriage, with a particular focus on early marriage (see, for example, UNDESA 1990; Singh and Samara 1996; Hertrich 2002; and Mensch et al. 2005). Some studies have even investigated the timing of marriage and first sex (see, for example, AGI 1995; Blanc and Way 1998; Choe et al. 2001; PRB 2001; and Zlidar et al. 2003), but aside from speculative comments linking the two circumstances discussed above, or descriptions of trends in early marriage and sexual initiation, and some observations of the relationship between the trends, no studies have modeled the association.

Although studies analyzing the association between changes in marriage age and sexual debut have not been conducted, some discussion in the sociological literature suggests that values and norms regarding premarital sexual activity have changed with delayed marriage. Referring to the United States, one sociologist asserted nearly 20 years ago that “The increased sexual freedom among adolescents and young adults is likely to be related to the delay in marriage. . .” (Tanfer 1987:483). A report published by the Alan Guttmacher Institute declared that “In the developed countries, as the age at first marriage has risen and as values have changed over the last several decades, so has the likelihood that a woman will begin to have premarital sexual relationships during her adolescence” (AGI 1998:19).

Other studies have investigated how marriage and sexual behavior have simultaneously been altered by a third set of factors. One study, conducted by economists in the US, has investigated how changes in state laws regarding access to oral contraceptives affected both marriage and sexual behavior. The researchers found that the diffusion of oral contraceptives in the 1960s led to a delay in age at first marriage and an increase in premarital sex. “Marriages were delayed considerably beginning with the birth cohorts of the late 1940s, precisely those affected by the pill, and the age at first sexual relations among the never married also decreased, again in line with the cohorts affected by the availability of the pill” (Goldin and Katz 2002:751).²

Few studies have quantified how exogenous shocks such as the introduction of modern contraceptives or broader social and economic change may simultaneously have altered marriage and sexual behavior in sub-Saharan Africa, although some discussion of this subject appears in the literature. In reviewing ways in which the Western experience with regard to adolescent reproductive behavior may have implications for the developing world, Furstenberg (1998:249) argues that “economic development provides a hospitable context for premarital sexual behavior, especially in societies with traditions of early marriage that have tolerated sexual relations as part of the courtship process.” His reasoning is that with development, educational attainment increases and young people become more autonomous. With reduced parental authority and greater contact with peers, age at marriage increases and premarital sexual activity rises. A review of marriage patterns conducted by the National Research Council as part of its study on population dynamics in Africa is more specific about the mechanisms at work in the region. The authors point both to the increase in education and to the changing nature of bridewealth as forces behind the delay in marriage and the

alteration of sexual behavior. Cash payments are replacing bridewealth payments in kind. Moreover, young men rather than their families increasingly are bearing the burden of bridewealth. Not only is this practice undermining families' control over the marriage process, contributing to a rise in age at marriage, but also it is said to give young men "independent access" to sexual partners (National Research Council 1993:51).

The analysis presented here contributes both to the sociological literature on the links between marriage and premarital sex, which is highly speculative, and to the body of demographic knowledge on trends in adolescent reproductive behavior by answering the largely unaddressed question of how changes in the prevalence of early marriage have affected the likelihood of initiating premarital sex. In contrast to previous research, our study explicitly models the association between trends in marriage and first sex by age 18. We use multiple-decrement life tables to examine the competing risks of premarital sex and marriage without prior sexual experience. By comparing the relative changes over time in the proportion of women who had premarital sex or married as virgins by age 18, we can determine whether the context of sexual debut has changed, that is, whether sexual initiation is increasingly occurring prior to rather than at marriage. Our analysis is entirely descriptive and makes no attempt at causal explanations. Nevertheless, by disentangling the effects of increased exposure to premarital sex from the effects of increased rates of premarital sex, we hope to advance our understanding of changes in the timing and context of sexual debut in sub-Saharan Africa.

DATA QUALITY

When examining reproductive behavior in the developing world, the issue of data quality comes to the fore in terms of measuring age at marriage and age at premarital sex and in determining trends.

Age at marriage

In the DHS, marriage is reported as a self-defined state. Respondents are coded as "married" if they say they are in response to questions on whether they are currently married or are living with a man. Therefore, age at first marriage is typically recorded as age at first cohabitation with a partner or husband (Kishor 2003). Some researchers have criticized the DHS for not including questions on regular partners who are not coresident, thereby potentially underestimating union formation³ (van de Walle and Lardoux 2005). The primary data-quality issue discussed in the literature, however, is the differential reporting of age at first marriage among younger and older women, specifically, the forward displacement of dates as an individual ages; that is, older respondents are assumed to report early events as occurring nearer to the survey date than to the actual date of the event (see, for example, Blanc and Rutenberg 1990). If forward displacement is greater among older women when age at marriage is rising, comparisons between older and younger age groups in age at first marriage will underestimate the amount of change that has occurred.

Using data from the first round of the DHS, Blanc and Rutenberg (1990) cite evidence that the median age at marriage was reported as a half-year older among members of the oldest cohort of women compared with the second-oldest cohort; that is, women aged 45–49 reported marrying at older ages than did women aged 40–44, the opposite of the pattern found in all subsequent age cohorts within the same surveys. They cite the prevalence of informal consensual unions in Africa and Latin America as the potential source of this bias, in that “the oldest women may fail to recall or to report accurately the date of their first informal union” (1990:49). Other researchers have reached the opposite conclusion, however, speculating that “[b]ecause conjugal relationships often develop gradually, a woman whose union endures may retrospectively report being married earlier than she would have if she had been asked at the time” (National Research Council 1993:26). When marriage is viewed as a process, such that the onset of sexual relations, cohabitation, and an official ceremony do not necessarily occur simultaneously, the changing interpretation of what the stages of the process mean may drive changes in reporting of age at “marriage” (Meekers 1992; van de Walle 1993; van de Walle and Lardoux 2005). This consideration does not conflate changing societal definitions of marriage with an individual woman’s reinterpretation of the process and timing of her own marriage, but allows us to recognize how a respondent’s position within her life course may influence her reporting of potentially sensitive information.

By following a birth cohort throughout multiple surveys, we assess how reports of age at marriage change as women age. Sixteen countries in sub-Saharan Africa have collected data in two or more DHS surveys, most with an interval of five to eight years between the earliest and the most recent survey. Figure 1 presents the difference between the earliest and the most recent survey in the proportions of women who report marrying by age 18 for three five-year birth cohorts, those aged 20–24, 30–34, and 40–44 at the time of the earliest survey.⁴ In the majority of countries, a smaller proportion of women report marrying by age 18 in the most recent survey than in the earliest survey. Although this pattern implies a trend toward forward displacement, in only six of the 16 countries is this pattern significant.

Age at first sex

The measurement of age at first sex is considerably more problematic than the measurement of age at first marriage. The earliest rounds of the DHS explicitly asked unmarried women whether or not they had ever had sex; if they gave a positive response, the interviewers collected additional data on their sexual behavior and history. In contrast, more recent survey rounds have made the implicit assumption that the respondent has had sex, giving the respondent the responsibility of denying that she has engaged in sexual activity. Although the changes in question wording and sequence were introduced as a result of concerns that women underreported their sexual activity when they were asked explicitly about it, cross-survey analysis of ten countries in sub-Saharan Africa and Latin America found little evidence that changes in question wording influenced the reporting of premarital sexual activity among 15–24-year-old men and women (Curtis and Sutherland 2004).

Of greater concern is the unwillingness of survey respondents, particularly unmarried young women, to report experience of premarital sex. A number of studies have questioned the quality of data concerning premarital sex in survey results from developing countries (Dare and Cleland 1994; Mensch et al. 2003b; Curtis and Sutherland 2004; Zaba et al. 2004). Analyses indicate that underreporting appears to be widespread among girls. Moreover, the collection of biomarkers in recent surveys reveals the presence of “virgin” infections, that is, positive tests for STIs among young women who claim never to have had sex (Buvé et al. 2001:S117).

Zaba and her colleagues (2004) focus on countries with multiple surveys to track a birth cohort’s reporting of age at sexual debut across time. In Kenya, Tanzania, and Zimbabwe, they find evidence that as women age, they report younger ages at first sex, a pattern that, if it were detected throughout the region, would overestimate change if age at first sex is increasing. They contextualize this observed pattern with respect to HIV-related interventions that promote abstinence and later ages at first sex, whereby younger women may be inclined to deny early sexual activity. Using data from Vietnam, Mensch et al. (2003a) found that young married women were more likely than their unmarried peers to report ever having had premarital sex. Although most of these women reported that they had premarital sex with their fiancés, married women may have felt freer to acknowledge premarital sexual activity in a context where such relations are regarded as undesirable.

An analysis of the 16 sub-Saharan African countries where two or more DHS surveys have been conducted reveals considerable heterogeneity in reporting experience of sex by age 18 as women age. Figure 2 shows the difference between the earliest and the most recent survey in the proportion of women who report ever having had sex by age 18 for three five-year birth cohorts, those aged 20–24, 30–34, and 40–44 at the time of the earliest survey. Nine of the 16 countries show evidence of significant forward displacement of age at first sex, whereas four countries show evidence of significant backward displacement.⁵

In her analysis, Gage (1995) found little evidence of either forward or backward displacement of age at first sex among older women. She cited, however, greater concern for the consistency and completeness of older women’s reporting of dates of first marriage, first sexual intercourse, and first birth. The DHS uses a woman’s reported age at each of these transitions to adjust for discrepancies.⁶ In cases where the age at first sex is reported to be up to one year after the birth of a woman’s first child, the age at first sex is reduced by one year reflecting the assumption that children’s birth dates are more reliably reported than is age at first sex. In all other instances where a discrepancy is found, such as when reported age at first sex exceeds a woman’s age at the time of the survey or occurs more than one year after the date of first birth, age at first sex is recoded as “inconsistent” (Macro International 2004). In every survey conducted most recently by the DHS in sub-Saharan Africa, a higher proportion of 40–44-year-olds than 20–24-year-olds provided inconsistent responses, as documented by a variable included in the data files for imputed age at first sex (not shown). In most countries, approximately 5 percent of women provide inconsistent responses. In Ghana and Namibia, however, more than 10 percent of women aged 40–44 report ages at first sex that are inconsistent with their reported age at first birth. For the purposes of this paper, women with an inconsistent age at first sex are omitted from the analysis.

DATA AND METHODS

In light of the variations in questionnaire design and sampling error across surveys, we analyze change over time using retrospective data for the most recent DHS available for each country in sub-Saharan Africa. By comparing the reported ages at first marriage and sexual debut across the cohorts of women aged 20–24 and 40–44 at the time of the survey, we are able to assess changes in behavior that have occurred over the course of two decades. For most countries in which surveys were conducted between 1998 and 2003, this analysis strategy covers a period roughly spanning the 1970s for the older cohort and the 1990s for the younger cohort. Furthermore, this strategy expands the number of countries available for analysis. Although multiple surveys have been collected in 18 of the 27 sub-Saharan African countries covered by the DHS, only in Burkina Faso, Ghana, Kenya, Nigeria, and Zambia were the surveys conducted ten or more years apart. In most other cases, the intersurvey period is only five to six years, too short an interval to draw valid conclusions about changes in behavior (Curtis and Sutherland 2004). Finally, by using data collected during the same survey round, we know that all women were subject to the same social pressures with regard to reporting premarital sex. We assume that both the older and younger cohorts are influenced by the norms in place at the time the data were collected. We recognize, however, that these norms may have differential effects, that younger women may feel social pressure more acutely and, therefore, may be more likely to underreport premarital sex. If this is the case, we may underestimate the extent of change.

Another issue that may undermine cohort comparisons is the potential existence of selection effects due to differential mortality. The 40–44-year-olds who have survived to be interviewed may be less likely to have had an early age of sexual debut, whether because of early marriage or early premarital sex. If those who died married earlier than those who survived, perhaps because of greater risk of maternal morbidity and infection with HIV, we may underestimate the amount of change that has occurred in age at marriage. If those who died were more likely to engage in premarital sex by age 18, we may overestimate the amount of change that has occurred in premarital sex. With the data at hand we are unable to determine the magnitude of such effects.

Previous analyses of sexual debut have used current-status data to measure change over time, comparing the proportion of 15–19 or 15–24-year-olds who have ever had sex across multiple surveys (see, for example, Singh et al. 2000 and Ali and Cleland 2005). Current-status data is likely to be biased by the age structure of the sample, however. Zaba and her colleagues (2004) compare the distributions of age at first sex in Kenya calculated from current-status data, retrospective data, and from a life table that combines current-status and recall data. They demonstrate that an analysis using recall data alone produces an estimate of younger sexual debut because it fails to account for those women who have not yet begun sexual activity at the time of the survey. The combination of current-status and retrospective reports of age at first sex make survival analysis the most robust approach by grounding the calculations in person-years of exposure. Young women who have not yet begun to have sex at the time of the survey are censored from the analysis, providing the most accurate portrayal of the transition to sexual activity (Zaba et al. 2004).

A focus on adolescent sexual debut, defined here as experiencing first sex prior to age 18, renders survival analysis unnecessary when calculations are made for older cohorts. Women aged 20–24 and 40–44 are able to provide complete information on sexual experiences that occur during the adolescent period; therefore, any calculation of sexual debut prior to age 18 will not be censored. Thus the proportion of women who have had sex prior to age 18 will be the same whether it is calculated strictly from recall data or derived from survival analysis. Although this calculation masks the age pattern of sexual debut during adolescence, it provides a complete picture of changes over time in the proportion of women whose sexual debut occurred prior to age 18.

In addition to the timing of sexual debut, this paper analyzes how the context of first sex has altered. Sexual debut must be considered as a multiple-decrement process; premarital sex and marriage without prior sexual experience are the “competing risks” for first sex. By comparing the relative shifts over time in the proportion of women who had premarital sex or who married as virgins by age 18, we can determine whether the context of sexual debut has been transformed.

Caution must be exercised, however, when interpreting changes across the two cohorts in the proportions of the associated causes of sexual debut. An observed increase in the proportion of women who had premarital sex prior to age 18 does not mean that the rate of premarital sex has increased. On the contrary, the rate at which young women engage in premarital sex may remain the same or decline, even as the proportion increases. Given that the proportion of women who experience premarital sex by age 18 is essentially the same calculation as the cumulative probability of their having premarital sex through that age, it is useful to consider that the rate and probability that women experience premarital sex by age 18 are closely related. Both have as their numerator the number of women who have their first premarital sexual experience during a given interval. Likewise, the rate and probability that women marry as virgins prior to age 18 share as their numerator the number of women who have their first sexual experience at the time of marriage during a given interval. These statistics differ in their denominators, however: The rate of both premarital sex and marriage as a virgin is based on the total number of person-years spent at risk of sexual debut, or in other words, the total person-years spent in a non-sexually active state, whereas the probabilities are based on the number of women who have not yet experienced their sexual debut at the beginning of the interval. Even if the rate of premarital sex is held constant, the probability of premarital sex will change if the rate of marriage changes.⁷ Stated another way, delays in marriage increase the period of exposure to the risk of premarital sex; even if the rate of premarital sex remains constant, more young women can be expected to experience their sexual debut prior to marriage. Therefore, changes in both the proportions and the rates of young women who experience their sexual debut prior to age 18 are considered here in order to answer the question of how shifts in premarital sex are related to shifts in age at marriage.

RESULTS

Trends in marriage by age 18

In all 27 sub-Saharan African countries investigated here, a smaller proportion of 20–24-year-olds than of 40–44-year-olds report having been married by age 18—a significant reduction everywhere except Guinea, Mali, and Mozambique.⁸ Nonetheless, many young women continue to marry during their teenage years, as shown in the first column of Table 1. In only three countries did fewer than 25 percent of 20–24-year-old women marry by age 18, and only in Namibia and South Africa did fewer than 10 percent marry by that age. In contrast, in eight countries more than half of the women marry by age 18, and in two, Chad and Niger, more than 70 percent of 20–24-year-old women marry by that age.

The cross-cohort decline in early marriage is striking, with at least a 25 percent decline in more than half of the countries. No direct relationship between the prevalence of early marriage among 40–44-year-olds and the magnitude of the percentage of decline is observed; of the two countries with the highest levels of early marriage, the prevalence declined by 38 percent in Ethiopia, whereas in Niger it declined by only 14 percent.

Trends in sex debut prior to age 18

The trends in the proportion of women who had sex prior to age 18, as shown in the third and fourth columns of Table 1, are less clear. A significant decline in adolescent sexual debut across the two cohorts is observed in 13 countries, a significant increase in four countries, and no significant change in ten countries. Despite the cross-cohort declines in adolescent sexual debut, in 21 of the 27 countries more than half of 20–24-year-old women still had their first sexual experience prior to age 18. In only three countries did fewer than 40 percent of 20–24-year-olds have sex prior to age 18—Comoros, Rwanda, and Zimbabwe.

Decomposing sexual debut

Although the prevalence of adolescent sexual debut is closely related to the prevalence of marriage prior to age 18, the difference in the two measures reflects the prevalence of premarital sex and the subsequent period of time that elapses between first sex and first marriage. An analysis of earlier DHS surveys found that whereas both marriage and sexual initiation by age 18 declined over the two decades prior to the survey, age at marriage was rising faster than age at first sex, leading the authors to infer a higher prevalence of premarital sexual activity across the two cohorts (Blanc and Way 1998). Although this comparison of the prevalence of marriage and sexual debut during adolescence is enlightening, decomposing sexual debut into its two components—premarital sex and marriage without prior sexual experience—is more informative. Likewise, marriage data can be decomposed into those who wed as virgins and those who wed following a premarital sexual debut, although not all those who had premarital sex prior to age 18 also married during adolescence.

The proportion of women who had premarital sex by age 18 increased significantly across the two cohorts in 19 countries, declined significantly in two countries (Kenya and Zimbabwe), and had no significant change in six countries. Although the three countries with the lowest proportion of premarital sex by age 18 were among those with no change (Comoros, Ethiopia, and Niger), another country with no significant difference between the younger and older cohorts was Gabon, the country with the highest proportion of women reporting having had premarital sex by age 18. In contrast, the proportion of women who married by age 18 with no prior sexual experience decreased significantly across the two cohorts in all countries except Mozambique, for which no significant change was observed.

In the 19 countries where premarital sex has become more common during adolescence, the overall timing of sexual debut has been far more varied. The proportion of women who had sex before age 18 declined significantly in six of the countries where premarital sex increased. Likewise, no change has occurred in the proportion of women who had their first sexual experience during adolescence—despite significantly increased premarital sex—in an additional nine countries. Only in four countries—Mozambique, Namibia, South Africa, and Togo—did the prevalence of all adolescent sex increase alongside the prevalence of premarital sex. In each of the countries where the prevalence of all sex and premarital sex moved in different directions, the effect of increased premarital sex was countered by the decline in the prevalence of marrying without prior sexual experience.

The magnitude of the change in the prevalence of premarital sex and marriage as a virgin before age 18 also signals a shift in the context in which sexual initiation takes place. By comparing columns 5 and 6 of Table 1 with columns 7 and 8 we can determine changes in the primary site of sexual debut. Among 40–44-year-old women, marriage was the most common context of sexual debut in 21 of the 27 countries, while premarital sex was the most common in the remaining six countries. In contrast, among 20–24-year-old women, premarital sex was the most common context of sexual debut in 13 countries; the combined effect of the declining prevalence of marriage by age 18 and the increased prevalence of premarital sex by that age was such that premarital sex surpassed marriage as the context of sexual debut for this age group in seven countries: Benin, Cameroon, Central African Republic, Ghana, Madagascar, Tanzania, and Zambia.

Changes in the rate of premarital sex

In the countries where the proportion of women reporting experience of premarital sex by age 18 increased, whether the rate of premarital sex increased or the exposure to the risk of premarital sex increased as the rate of marriage as a virgin declined is not clear. Table 2 shows the rates of premarital sex and marriage as a virgin per hundred person-years from ages 14 to 18, comparing the reports of women aged 20–24 and 40–44 years old. We selected age 14 because most sexual activity prior to that age is reported to occur at the time of marriage; only at age 14 do women begin to report nontrivial amounts of premarital sex. By calculating the rate from ages 14 to 18, we hope to capture the period when young women are able to engage in the decision to marry or to begin premarital sexual relations (while acknowledging that both decisions are often influenced by others). The ratio of the rate

experienced by 20–24-year-olds to the rate experienced by 40–44-year-olds reflects the magnitude of change over time; for instance, from the rate ratios we know that in Benin, the rate of premarital sex increased by almost 60 percent during the past two decades, whereas the rate of marriage declined by 30 percent during the same period. The significance of the rate ratio is assessed by a stratified Mantel-Haenszel test that controls for the age-specific rates within the period (StataCorp 2003).

The rate of premarital sex increased significantly in 13 countries, six in West and Middle Africa and seven in southern and East Africa. The two countries with the largest rate ratios were Burkina Faso and Senegal, where the rates increased by approximately 85 percent, although they are still low, especially in Senegal. The absolute difference in the rates is larger whereas the rate ratio is smaller in other countries, for example, Benin and South Africa, as a result of the higher rates of premarital sex reported by 40–44-year-old women. The rate of premarital sex declined in Kenya and Zimbabwe, the two countries in which the prevalence of premarital sex by age 18 also declined. No significant change is observed in the rate of premarital sex in 12 countries. In six of these countries, however (Cameroon, Central African Republic, Chad, Côte d’Ivoire, Nigeria, and Tanzania), the prevalence of adolescent premarital sex increased significantly (as shown in Table 1).

The two countries with the highest rates of premarital sex among 20–24-year-old women, Côte d’Ivoire and Gabon, experienced no significant change in the rate of premarital sex, although the prevalence of premarital sex in Côte d’Ivoire increased significantly across the two cohorts. Throughout most of the region, however, the rate of premarital sex was relatively moderate, with fewer than ten women per hundred person-years reporting that they had experienced their sexual debut between ages 14 and 18 in 12 countries. Moderate rates of marriage as a virgin were even more common, with rates of fewer than ten women per hundred person-years reported in 15 countries.

Attributing the source of the increase in premarital sex

The final analysis determines whether the significant increase in the prevalence of premarital sex in 19 of the 27 countries is more closely associated with a rise in the rate of premarital sex or an expansion in the period of exposure to the risk of premarital sex, as measured by a decline in the rate of marriage as a virgin. Table 3 categorizes each of the 19 countries according to whether the rate dominates or whether the exposure dominates. The process of attributing change to the rate or the exposure is more straightforward in some countries than in others. For example, in both Mali and Mozambique the rate of premarital sex increased significantly although no significant decline was found in the rate of early marriage. Therefore, the increased prevalence of premarital sex in these two countries can be attributed entirely to the rise in the rate of premarital sex. In contrast, for the six countries where no significant change was found in the rate of premarital sex, the increased prevalence can be attributed to an increase in the period of exposure, driven by the significant decline in the rate of early marriage.

For the remaining 11 countries where the prevalence of premarital sex increased significantly, the attribution is more difficult. In each country, a significant change is seen in

both the rate of premarital sex and the rate of marriage without prior sexual experience. Therefore, judgment as to which dominates, rate or exposure, is based on an assessment of both the rate ratios and the absolute difference in rates across the two cohorts. In Benin, Namibia, and South Africa, both the magnitude of the rate ratio and the absolute change in rate are greater for premarital sex; therefore, these countries are classified as being influenced more by the change in the rate of premarital sex than by a change in exposure. In contrast, the magnitude of the rate ratio and absolute change in rate are greater for marriage as a virgin in Madagascar, Senegal, and Zambia; the observed increase in the prevalence of premarital sex in these countries is therefore classified as being influenced more by the change in period of exposure. In the remaining five countries (Burkina Faso, Guinea, Malawi, Rwanda, and Togo), the change is attributable to both changing rate and changing exposure, with neither a more dominant influence than the other.

CONCLUSION

The authors of this study investigated the links between trends in age at marriage and premarital sexual behavior in 27 sub-Saharan countries with DHS surveys conducted between 1994 and 2003. At the outset, the first question we posed was whether changes in the prevalence of early marriage have affected the likelihood that a young woman will engage in premarital sex. Secondly, if an increase occurred in the proportion of young women who reported having engaged in premarital sex, is the change influenced more by increased exposure resulting from a delay in marriage or by an increase in the rate of premarital sex?

Our analysis, which compares 20–24-year-olds with 40–44-year-olds, indicates that: (1) the prevalence of marriage by age 18 has declined significantly in 24 of 27 countries; (2) the prevalence of premarital sex by age 18 has increased significantly in 19 countries; and (3) the prevalence of sexual initiation by age 18—whether before or at marriage—has declined significantly in 13 countries, increased significantly in four and not changed in ten. Thus, the assertion that a pervasive shift has occurred toward earlier sexual debut is not supported by these data.

The analysis reveals a shift, however, in the context of sexual debut in a number of countries. Among 40–44-year-olds, marriage was the most common site of sexual initiation in 21 of 27 countries. In contrast, among 20–24-year-olds, marriage was the most common site of sexual initiation in 14 of 27 countries, whereas premarital sex was the most common site in the other 13 countries. These results indicate that while the age of first sexual activity has either remained the same or increased, a shift in the context of sexual debut from marriage to premarital sexual activity has taken place in many countries

Among the 19 countries with a significant increase in the prevalence of premarital sex, the greater or exclusive source of increase was found to be the longer period of exposure experienced by the younger cohort in nine countries. In five countries, the increased prevalence of premarital sex can be attributed more, and in two of those countries entirely, to an increase in the rate of premarital sex; in the remaining five countries the increase is attributable to both a higher rate of premarital sex and longer exposure. In sum, although the proportion of young women engaging in premarital sex has indeed risen in sub-Saharan

Africa, in some settings greater exposure explains more of this increase, whereas in others an increased rate of premarital sex is dominant.

Without further analysis we can only speculate about the ways in which social and economic change may have affected both the timing of marriage and the context of sexual initiation in Africa. In countries where the rate of premarital sex has increased along with age at marriage, the same set of factors may be acting on both. Perhaps the loosening of familial control over offspring has undermined both the traditional marriage process and attitudes toward premarital sex. Moreover, norms regarding what is expected and appropriate behavior may have altered with increasing exposure to a more globalized youth culture, although young people in Africa are less exposed to forces of globalization than are their peers elsewhere (Cohen et al. 2005). A comparison of trends in Africa with those in Asia could be illuminating, although comparable data for a large number of Asian countries are not available.

The links between schooling and marriage and sexual activity are also worth considering. Recent analyses of DHS data have shown that increased educational attainment in sub-Saharan Africa has contributed to the decline in early marriage (Mensch et al. 2005) and that girls who are enrolled in school are less likely than those who are not enrolled to engage in premarital sex (Blanc et al. 2005). Perhaps one reason that the increase in premarital sex is not greater and that the rate of premarital sex has not increased in more countries is that the levels of schooling are rising among girls.

This analysis of the changing context of sexual initiation in sub-Saharan Africa leaves a number of issues unaddressed. First, we should attempt to model how the patterns we have observed are associated with young people's changing social and economic environment. Second, we need to consider whether increased exposure to the risk of premarital sex, together with the rise in the prevalence of premarital sex, have altered norms regarding acceptable behavior. Finally, the magnitude of the AIDS epidemic in the region, putting young women at particularly high risks of HIV transmission, demands a better understanding of the consequences for reproductive health of the identified behavior. Given potential differences in the nature of sexual activity within and prior to marriage (see Clark 2004), we should investigate how the change in the context of sexual debut has affected the risk of HIV infection among young women.

NOTES

- 1 Among some groups in sub-Saharan Africa, demonstration of fertility prior to marriage is considered desirable (Zabin and Kiragu 1998). Indeed, pregnancy may be an important step toward a union (National Research Council 1993). Therefore, the claim that all premarital births in the region are unwanted would be an overstatement.
- 2 Other researchers have speculated about how norms of sexual behavior were transformed in the United States with the advent of the pill and the legalization of induced abortion in the 1970s (see, for example, Hayes 1987).
- 3 By ignoring unions with stable noncohabiting partners, some would argue that we overestimate change in age at marriage (van de Walle and Baker 2004).
- 4 In countries where the interval between surveys is greater than five years, responses from women aged 40–44 are omitted from this analysis and are missing from the figure.
- 5 For Tanzania, our findings confirm those observed by Zaba and her colleagues (2004), whereas for Kenya and Zimbabwe we find evidence that women report older ages at first sex, the opposite conclusion that Zaba and her colleagues reached. This analysis differs from that conducted by Zaba et al. in two respects, however. First, Figure 2 compares the proportions of women who report having had sex by age 18, whereas Zaba and her colleagues compared the reported median age at first sex across multiple surveys as a cohort aged. The former approach masks any changes in the age pattern of sexual debut that occur prior to age 18, whereas the latter does not account for behavior that occurs between the median age and age 18, provided that the median age of sexual debut is younger than 18. Second, we trace three birth cohorts from the earliest to the most recent survey available, whereas Zaba and her colleagues age forward the 15–19-year-old birth cohort at the time of each survey. These two approaches examine variation in reporting at different stages of the life course, a difference that may also influence the direction of observed displacement.
- 6 The age at first birth is calculated from the woman's birth date and the birth date of her first child. Age at marriage and age at first sex are reported directly.
- 7 This apparent contradiction is resolved by considering the likelihood of having premarital sex as a "dependent probability," related to the rate of all associated causes of sexual debut, such that:

$${}_nq_x^p = (n * {}_nm_x^p) / (1 + 0.5 * ({}_nm_x^p + {}_nm_x^m)),$$

where ${}_nq_x^p$ is the probability of premarital sex in the interval x to $x+n$, ${}_nm_x^p$ is the rate of premarital sex in the interval x to $x+n$, ${}_nm_x^m$ is the rate of marriage without prior sexual experience in the interval x to $x+n$, and n is the length of the interval (Preston et al. 2001).

- 8 A t-test of the equality of means was used to determine whether a significant difference is found in the proportion of women who married and had sex by age 18 across the two cohorts. As Figures 1 and 2 show, as women age, considerable heterogeneity exists in their reporting of marriage and sexual debut by age 18. In the absence of systematic forward or backward displacement, we come to no conclusions with regard to the effect of these nonsampling errors for estimating change in the context of sexual initiation.

REFERENCES

- Alan Guttmacher Institute (AGI). 1995. *Sexual Relationships and Marriage Worldwide. Women, Families and the Future Series*. New York: AGI.
- . 1998. *Into a New World: Young Women's Sexual and Reproductive Lives*. New York: AGI.
- Ali, Mohamed M. and John Cleland. 2005. "Sexual reproductive behaviour among single women aged 15–24 in eight Latin American countries: A comparative analysis." *Social Science & Medicine* 60(6): 1,175–1,185.
- Blanc, A., R. Magnani, S. Singh, S. Jejeebhoy, and R. Bulatao. 2005. "Health." In *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. National Research Council and Institute of Medicine. Ed. Cynthia B. Lloyd. Washington, DC: National Academies Press. Pp. 168–264.
- Blanc, Ann K. and Naomi Rutenberg. 1990. "Assessment of the quality of data on age at first sexual intercourse, age at first marriage and age at first birth in the Demographic and Health Surveys." In *An Assessment of DHS-I Data Quality*. DHS Methodological Reports. Columbia, MD: Institute of Resource Development/Macro Systems. Pp. 41–79.
- Blanc, Ann K. and Ann A. Way. 1998. "Sexual behavior and contraceptive knowledge and use among adolescents in developing countries." *Studies in Family Planning* 29(2): 106–116.
- Bongaarts, John and Barney Cohen. 1998. "Introduction and overview." *Studies in Family Planning Special Issue: Adolescent Reproductive Behavior in the Developing World* 29(2): 99–105.
- Buvé, A., E. Lagarde, M. Caraël et al. and the Study Group on Heterogeneity of HIV Epidemics in African Cities. 2001. "Interpreting sexual behaviour data: Validity issues in the multicentre study of actors determining the differential spread of HIV in four African cities." *AIDS* 15(supplement 4): S117–S126.

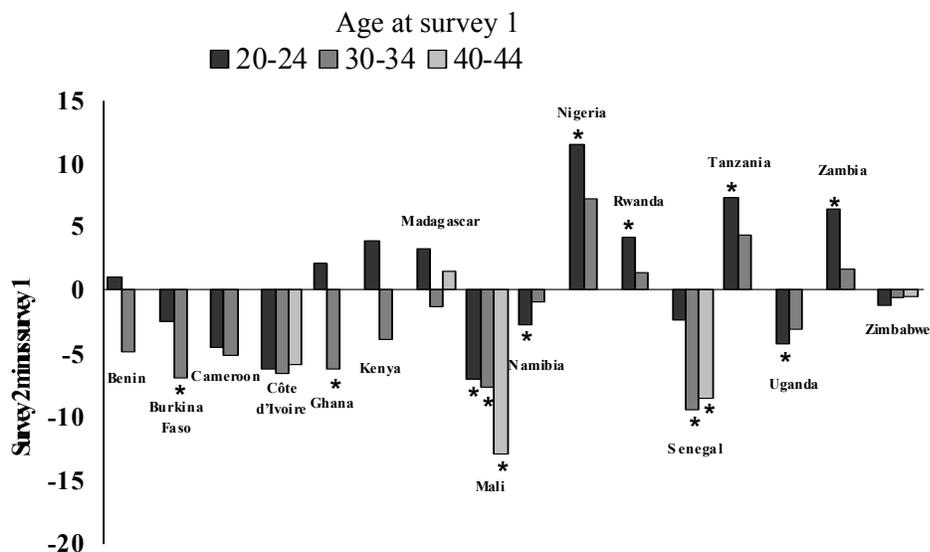
- Choe, Minja K., Hui-Sheng Lin, Chai Podhisita, and Corazon Raymundo. 2001. "Sex and Marriage: How Closely Are They Related in the Philippines, Taiwan, and Thailand." *East-West Center Working Papers, Population Series* No. 118–14. Honolulu, HI: East-West Center.
- Clark, Shelley. 2004. "Early marriage and HIV risks in sub-Saharan Africa." *Studies in Family Planning* 35(3): 149–160.
- Cohen, B., R. Jessor, H. Reed, C.B. Lloyd, J. Behrman, and D. Lam. 2005. "Conceptual framework." In *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. National Research Council and Institute of Medicine. Ed. Cynthia B. Lloyd. Washington, DC: National Academies Press. Pp. 32–63.
- Cohen, Susan A. 2004. "Delayed marriage and abstinence-until-marriage: On a collision course?" *The Guttmacher Report on Public Policy* 7(2): 1–3. <<http://www.guttmacher.org/pubs/tgr/07/2/gr070201.html>>. Accessed 7 March 2005.
- Curtis, S.L. and E.G. Sutherland. 2004. "Measuring sexual behaviour in the era of HIV/AIDS: The experience of Demographic and Health Surveys and similar enquiries." *Sexually Transmitted Infections* 80(supplement II): ii22–ii27.
- Dare, O.O. and John G. Cleland. 1994. "Reliability and validity of survey data on sexual behavior." *Health Transition Review* 4(supplement): 93–110.
- Feyisetan, Bamikale and Anne R. Pebley. 1989. "Premarital sexuality in urban Nigeria." *Studies in Family Planning* 20(6): 343–354.
- Furstenberg, Frank F., Jr. 1998. "When will teenage childbearing become a problem? The implications of Western experience for developing countries." *Studies in Family Planning* 29(2): 246–253.
- Gage, Anastasia J. 1995. "An Assessment of the Quality of Data on Age at First Union, First Birth and First Sexual Intercourse for Phase II of the Demographic and Health Surveys Program." *Occasional Papers* No. 4. Calverton, MD: Macro International.
- Gage, Anastasia J. and Dominique Meekers. 1995. "The changing dynamics of family formation: Women's status and nuptiality in Togo." In *Women and Demographic Change in Sub-Saharan Africa*. Eds. P. Makinwa-Adebusoye and A.-M. Jensen. Liège, Belgium: International Union for the Scientific Study of Population. Pp. 15–38.
- Gage-Brandon, Anastasia J. and Dominique Meekers. 1993. "Sex, contraception, and childbearing before marriage in sub-Saharan Africa." *International Family Planning Perspectives* 19(1): 14–18, 33.

- Goldin, Claudia and Lawrence F. Katz. 2002. "The power of the pill: Oral contraceptives and women's career and marriage decisions." *Journal of Political Economy* 110(4): 730–770.
- Hayes, Cheryl D. 1987. *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing*. Washington, DC: National Academy Press.
- Hertrich, V. 2002. "Nuptiality and gender relationships in Africa: An overview of first marriage trends over the past 50 years." Paper presented at the Annual Meetings of the Population Association of America, Atlanta, 9–11 May.
- Hughes, Jane and Ann P. McCauley. 1998. "Improving the fit: Adolescents' needs and future programs for sexual and reproductive health in developing countries." *Studies in Family Planning* 29(2): 233–245.
- Kishor, Sunita. 2003. "Uses and limitations of DHS data on age and characteristics of first marriages." Paper presented at UNICEF Global Consultation on Indicators: Female Genital Mutilation/Cutting and Early Marriage, New York, 12 November.
- Macro International. 2004. *Description of the Demographic and Health Surveys. Individual Recode Data File: Measure DHS+*. Calverton, MD: ORC Macro. <<http://www.measuredhs.com/zip/recodhs.zip>>. Accessed 22 June 2005.
- Meekers, Dominique. 1992 . "The process of marriage in African societies: A multiple indicator approach." *Population and Development Review* 18(1): 61–78.
- . 1994. "Sexual initiation and premarital childbearing in sub-Saharan Africa." *Population Studies* 48(1): 47–64.
- Mensch, Barbara S. 2005. "The transition to marriage." In *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. National Research Council and Institute of Medicine. Ed. Cynthia B. Lloyd. Washington, DC: National Academies Press. Pp. 416–505.
- Mensch, Barbara S., Wesley H. Clark, and Dang Nguyen Anh. 2003a. "Adolescents in Vietnam: Looking beyond reproductive health." *Studies in Family Planning* 34(4): 249–262.
- Mensch, Barbara S., Paul C. Hewett, and Annabel S. Erulkar. 2003b. "The reporting of sensitive behavior by adolescents: A methodological experiment in Kenya." *Demography* 40(2): 247–268.
- Mensch, Barbara S., Susheela Singh, and John B. Casterline. 2005. "Trends in the timing of first marriage among men and women in the developing world." In *The Changing Transitions to Adulthood in Developing Countries: Selected Studies*. Eds. C.B. Lloyd, J.R. Behrman, N.P. Stromquist, and B. Cohen. Washington, DC: National Academies Press. Forthcoming.

- Miller, Brent C. and Tim B. Heaton. 1991. "Age at first sexual intercourse and the timing of marriage and childbirth." *Journal of Marriage and the Family* 53(3): 719–732.
- National Research Council. 1993. *Social Dynamics of Adolescent Fertility in Sub-Saharan Africa: Population Dynamics of Sub-Saharan Africa*. Committee on Population, Commission on Behavioral and Social Sciences and Education. Eds. C.H. Bledsoe and B. Cohen. Washington, DC: National Academies Press.
- Population Reference Bureau (PRB). 2001. *Youth in Sub-Saharan Africa: A Chartbook on Sexual Experience and Reproductive Health*. Washington, DC: PRB.
- Preston, S.H., P. Heuveline, and M. Guillot. 2001. *Demography: Measuring and Modeling Population Processes*. Malden, MA and Oxford, UK: Blackwell Publishers.
- Rosero-Bixby, Luis. 1991. "Premarital sex in Costa Rica: Incidence, trends and determinants." *International Family Planning Perspectives* 17(1): 25–29.
- Singh, S. and R. Samara. 1996. "Early marriage among women in developing countries." *International Family Planning Perspectives* 22(4): 148–157, 175.
- Singh, S., D. Wulf, R. Samara, and Y.P. Cuca. 2000. "Gender differences in the timing of first intercourse: Data from 14 countries." *International Family Planning Perspectives* 26(1): 21–28.
- StataCorp. 2003. *Survival Analysis and Epidemiological Tables: Stata Statistical Software, Release 8.0*. College Station, TX: StataCorp.
- Tanfer, Koray. 1987. "Patterns of premarital cohabitation among never-married women in the United States." *Journal of Marriage and the Family* 49(3): 483–497.
- United Nations Children's Fund (UNICEF). 2001. *Early Marriage: Child Spouses. Innocenti Digest 7*. Florence, Italy: UNICEF Innocenti Research Center.
- United Nations Department of Economic and Social Affairs (UNDESA). 1990. *Patterns of First Marriage: Timing and Prevalence*. New York: United Nations.
- van de Walle, Etienne. 1993. "Recent trends in marriage ages." In *Demographic Change in Sub-Saharan Africa*. Eds. K.A. Foote, K.H. Hill, and L.G. Martin. Washington, DC: National Academies Press. Pp. 117–152.
- van de Walle, Etienne and K.R. Baker. 2004. "The evolving culture of nuptiality in sub-Saharan Africa." Paper presented at the Perspectives on International Family Change Conference, Population Studies Center, University of Michigan, Ann Arbor, 3–5 June.

- van de Walle, Etienne and Solene Lardoux. 2005. "Living with a man: Cohabitation in sub-Saharan Africa." Paper presented at the Annual Meetings of the Population Association of America, Philadelphia, 31 March–2 April.
- Zaba, B., E. Pisani, E. Slaymaker, and J. Ties Boerma. 2004. "Age at first sex: Understanding recent trends in African demographic surveys." *Sexually Transmitted Infections* 80(supplement II): ii28–ii35.
- Zabin, Laurie Schwab and Karungari Kiragu. 1998. "The health consequences of adolescent sexual and fertility behavior in sub-Saharan Africa." *Studies in Family Planning* 29(2): 210–232.
- Zlidar, V.M., R. Gardner, S.O. Rutstein, L. Morris, H. Goldberg, and K. Johnson. 2003. "New survey findings: The reproductive revolution continues." *Population Reports*. Series M., No. 17. Baltimore: Johns Hopkins Bloomberg School of Public Health, The INFO Project.

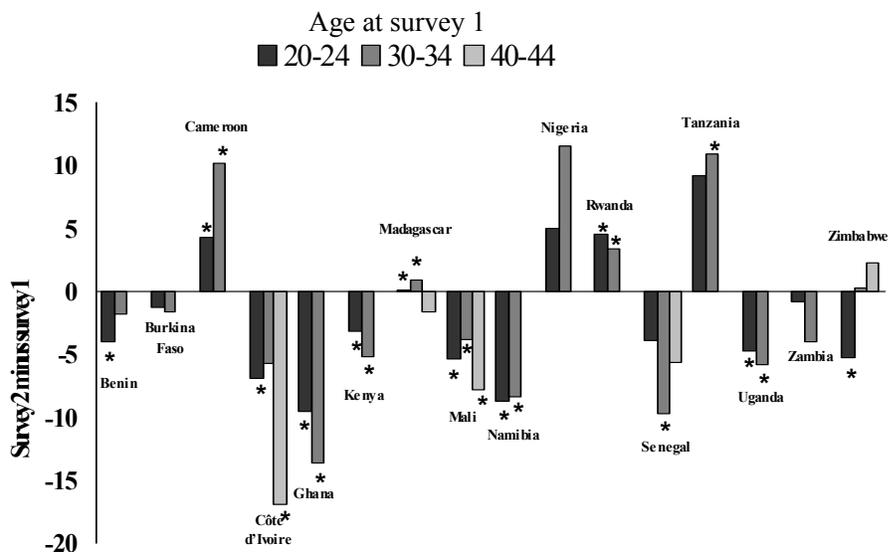
Figure 1 Difference between responses to surveys in percentage of women reporting that they were married by age 18, by age group, 16 sub-Saharan African countries



*Difference between surveys significant at $p \leq 0.05$.

Source: Demographic and Health Surveys.

Figure 2 Difference between responses to surveys in percentage of women who reported that they had had sex by age 18, by age group, 16 sub-Saharan African countries



*Difference between surveys significant at $p \leq 0.05$.

Source: Demographic and Health Surveys.

Table 1 Percentage of women surveyed at ages 20–24 and 40–44 who reported being married and having had sex before age 18, 27 sub-Saharan African countries

Country and survey year	Married by age 18 ^a		Had sex by age 18 ^a		Had premarital sex by age 18 ^b		Married as a virgin by age 18 ^b	
	20–24	40–44	20–24	40–44	20–24	40–44	20–24	40–44
West/Middle Africa								
Benin 2001	36.7	43.6	63.5	61.0	38.8	24.0	24.7	37.0
Burkina Faso 2003	51.9	59.0	65.3	68.2	22.7	12.7	42.5	55.5
Cameroon 1998	43.4	60.8	78.3	83.8	46.3	34.9	32.0	48.8
Central African Republic 1994–95	57.0	64.6	81.0	81.5	42.3	30.4	38.7	51.2
Chad 1996–97	71.4	77.9	77.3	81.4	14.8	10.5	62.5	70.9
Côte d'Ivoire 1998	33.2	49.7	75.8	78.1	54.7	41.3	21.1	36.8
Gabon 2000	33.6	41.0	81.0	83.9	62.3	60.2	18.7	23.7
Ghana 2003	27.9	37.7	46.4	56.3	24.3	27.1	22.0	29.2
Guinea 1999	64.5	68.5	77.6	78.5	24.4	15.5	53.2	63.0
Mali 2001	65.4	66.0	79.3	77.2	26.0	17.6	53.4	59.6
Niger 1998	76.6	89.1	79.1	89.8	4.5	2.7	74.5	87.1
Nigeria 2003	43.3	65.1	57.0	74.0	19.0	12.5	38.0	61.5
Senegal 1997	36.1	61.9	43.7	65.8	9.8	3.9	33.9	61.8
Togo 1998	30.5	40.4	65.0	59.5	47.4	29.9	17.6	29.6
Southern/East Africa								
Comoros 1996	29.7	54.5	34.8	63.6	9.6	10.8	25.2	52.8
Ethiopia 1999	49.1	79.4	51.6	81.4	7.5	6.7	44.1	74.6
Kenya 2003	24.6	37.2	50.3	65.9	36.9	43.8	13.4	22.1
Madagascar 1997	40.4	49.5	65.8	68.3	40.5	31.8	25.3	36.5
Malawi 2000	46.9	55.7	65.4	68.8	31.7	25.1	33.7	43.7
Mozambique 1997	56.6	59.9	79.7	73.5	38.6	31.8	41.1	41.8
Namibia 2000	9.8	15.8	49.1	39.8	42.2	26.5	6.9	13.4
Rwanda 2000	19.5	21.5	26.9	26.8	10.2	7.0	16.7	19.7
South Africa 1998	7.9	15.1	55.3	45.8	50.1	35.4	5.2	10.4
Tanzania 1999	39.3	61.2	67.0	77.8	41.8	33.1	25.2	44.7
Uganda 2001	53.9	59.5	73.5	78.5	35.9	35.5	37.6	43.0
Zambia 2001	42.1	59.7	66.0	74.6	38.9	23.9	27.1	50.7
Zimbabwe 1999	28.7	39.4	38.9	52.1	17.2	21.9	21.7	30.2

Note: Boldface type denotes significance at $p \leq 0.05$ based on a t-test for equality of means.

^a Computed from single-decrement life table.

^b Computed from multiple-decrement life table as competing risk for “Had sex by age 18.” Column 3 = column 5 + column 7. Column 4 = column 6 + column 8.

Source: Demographic and Health Survey country reports.

Table 2 Rates of first sex (per hundred person-years) experienced between ages 14 and 18, by context of sexual debut, according to reports by women aged 20–24 and 40–44, 27 sub-Saharan African countries

Country and survey year	Premarital sex			Marriage as a virgin		
	20–24	40–44	Rate ratio	20–24	40–44	Rate ratio
West/Middle Africa						
Benin 2001	13.2	8.2	1.597	8.1	11.7	0.696
Burkina Faso 2003	7.4	4.0	1.839	13.8	17.6	0.785
Cameroon 1998	18.8	16.8	1.124	11.9	19.9	0.598
Central African Republic 1994–95	17.0	13.9	1.227	15.8	20.1	0.784
Chad 1996–97	5.6	4.7	1.186	23.8	28.7	0.828
Côte d’Ivoire 1998	19.8	16.7	1.179	7.8	13.3	0.587
Gabon 2000	26.4	27.9	0.949	6.6	9.2	0.718
Ghana 2003	7.2	8.8	0.824	6.2	8.8	0.703
Guinea 1999	9.2	5.9	1.548	20.1	25.9	0.777
Mali 2001	9.9	7.5	1.323	22.3	24.5	0.911
Niger 1998	1.9	1.5	1.239	31.6	51.7	0.612
Nigeria 2003	6.1	5.2	1.173	10.3	18.6	0.553
Senegal 1997	2.8	1.5	1.853	9.5	21.3	0.447
Togo 1998	15.5	9.4	1.653	5.4	9.4	0.569
Median	9.6	7.9	1.233	11.1	19.3	0.700
Southern/East Africa						
Comoros 1996	2.5	3.2	0.785	6.4	17.2	0.373
Ethiopia 1999	1.9	1.5	1.254	12.2	31.1	0.391
Kenya 2003	10.3	14.7	0.705	4.1	7.1	0.573
Madagascar 1997	13.9	10.9	1.279	7.6	13.1	0.579
Malawi 2000	10.2	8.2	1.240	11.6	14.6	0.798
Mozambique 1997	15.1	9.6	1.580	15.0	16.9	0.886
Namibia 2000	12.6	7.7	1.638	2.0	3.1	0.638
Rwanda 2000	2.7	1.8	1.451	4.4	5.4	0.814
South Africa 1998	15.7	10.3	1.526	1.6	3.0	0.523
Tanzania 1999	13.9	14.3	0.969	9.2	18.8	0.486
Uganda 2001	13.2	14.1	0.936	13.7	16.7	0.823
Zambia 2001	13.0	8.5	1.534	9.8	18.6	0.526
Zimbabwe 1999	4.9	6.6	0.739	5.9	8.0	0.728
Median	12.6	8.5	1.254	7.6	14.6	0.579

Note: Boldface type denotes significance at $p \leq 0.05$ based on a Mantel-Haenszel test.

Table 3 Attribution of primary source of the increase in the prevalence of premarital sex, 19 sub-Saharan African countries

Rate	Rate > exposure	Both	Exposure > rate	Exposure
Mali	Benin	Burkina Faso	Madagascar	Cameroon
Mozambique	Namibia	Guinea	Senegal	Central African Republic
	South Africa	Malawi	Zambia	Chad
		Rwanda		Côte d'Ivoire
		Togo		Nigeria
				Tanzania

POLICY RESEARCH DIVISION WORKING PAPERS

If still in print, single copies of up to three working papers from 1989 through 2003 are available free of charge.

Beginning with the 2004 issues, working papers are no longer available in print format. Instead they are distributed electronically. As each new paper is completed subscribers are notified by e-mail and a link to the paper is provided.

To subscribe to the Policy Research Division working paper e-mail notification list, or to obtain back issues from 1989 to 2003, please send your request to prdwp@popcouncil.org.

PDFs of recent issues are available at www.popcouncil.org/publications/wp/prd/rdwplist.html

- | | | | |
|-------------|--|-----|--|
| 2005 | | 200 | Brian Wells Pence, Philomena Nyarko, James F. Phillips, and Cornelius Debpuur, "The effect of community nurses and health volunteers on child mortality: The Navrongo Community Health and Family Planning Project." |
| 206 | Barbara S. Mensch, Monica J. Grant, and Ann K. Blanc, "The changing context of sexual initiation in sub-Saharan Africa." | | |
| 205 | Geoffrey McNicoll, "Population and sustainability." | | |
| 204 | John Bongaarts, "The causes of stalling fertility transitions." | 199 | Zachary Zimmer, Linda G. Martin, Mary Beth Ofstedal, and Yi-Li Chuang, "Education of adult children and mortality of their elderly parents in Taiwan." |
| 203 | Ayaga A. Bawah and Fred N. Binka, "How many years of life could be saved if malaria were eliminated from a hyperendemic area of northern Ghana?" | 198 | Mian Bazle Hossain, James F. Phillips, and Thomas K. LeGrand, "The impact of childhood mortality on fertility in six rural thanas of Bangladesh." |
| 202 | Barbara S. Mensch, Susheela Singh, and John B. Casterline, "Trends in the timing of first marriage among men and women in the developing world." | 197 | Kristine R. Baker, Mary Beth Ofstedal, Zachary Zimmer, Zhe Tang, and Yi-Li Chuang, "Reciprocal effects of health and economic well-being among older adults in Taiwan and Beijing." |
| 201 | Zachary Zimmer, "Active life expectancy and functional limitations among older Cambodians: Results from a 2004 survey." | 196 | Mark R. Montgomery and Paul C. Hewett, "Poverty and children's schooling in urban and rural Senegal." |

2004

- 195 Luciana Suran, Sajeda Amin, Lopita Huq, and Kobita Chowdury, "Does dowry improve life for brides? A test of the bequest theory of dowry in rural Bangladesh."
- 194 Barbara S. Mensch, Monica J. Grant, Mary P. Sebastian, Paul C. Hewett, and Dale Huntington. "The effect of a livelihoods intervention in an urban slum in India: Do vocational counseling and training alter the attitudes and behavior of adolescent girls?"
- 193 Amanda Ritchie, Cynthia B. Lloyd, and Monica Grant. "Gender differences in time use among adolescents in developing countries: Implications of rising school enrollment rates."
- 192 John Bongaarts. "Long-range trends in adult mortality: Models and projection methods."
- 191 John Koku Awoonor-Williams, Ellie S. Feinglass, Rachel Tobey, Maya N. Vaughan-Smith, Frank K. Nyonator, Tanya C. Jones, and James F. Phillips, "Bridging the gap between evidence-based innovation and national health-sector reform in Ghana."
- 190 Kelly Hallman, "Socioeconomic disadvantage and unsafe sexual behaviors among young women and men in South Africa."

- 189 Toshiko Kaneda, Zachary Zimmer, and Zhe Tang, "Differentials in life expectancy and active life expectancy by socioeconomic status among older adults in Beijing."
- 188 Cynthia B. Lloyd and Monica J. Grant, "Growing up in Pakistan: The separate experiences of males and females."
- 187 Zachary Zimmer, Xianghua Fang, Toshiko Kaneda, Zhe Tang, and Julia Kwong. "Trends and transitions in children's coresidence with older adults in Beijing municipality."
- 186 Sajeda Amin and Alaka M. Basu. "Popular perceptions of emerging influences on mortality and longevity in Bangladesh and West Bengal."
- 185 John Bongaarts. "Population aging and the rising cost of public pensions."
- 184 Mark R. Montgomery and Paul C. Hewett. "Urban poverty and health in developing countries: Household and neighborhood effects."

2003

- 183 Agnes R. Quisumbing and Kelly Hallman. "Marriage in transition: Evidence on age, education, and assets from six developing countries."

- 182 Paul C. Hewett, Barbara S. Mensch, and Annabel S. Erulkar, "Consistency in the reporting of sexual behavior among adolescent girls in Kenya: A comparison of interviewing methods."
- 181 Zachary Zimmer, Linda G. Martin, and Hui-Sheng Lin, "Determinants of old-age mortality in Taiwan."
- 180 Frank K. Nyonator, J. Koku Awoonor-Williams, James F. Phillips, Tanya C. Jones, and Robert A. Miller, "The Ghana Community-based Health Planning and Services Initiative: Fostering evidence-based organizational change and development in a resource-constrained setting."
- 179 John Bongaarts and Griffith Feeney, "Estimating mean lifetime."
- 178 Elizabeth F. Jackson, Patricia Akweongo, Evelyn Sakeah, Abraham Hodgson, Rofina Asuru, and James F. Phillips, "Women's denial of having experienced female genital cutting in northern Ghana: Explanatory factors and consequences for analysis of survey data."
- 177 John Bongaarts, "Completing the fertility transition in the developing world: The role of educational differences and fertility preferences."
- 176 Cynthia B. Lloyd and Paul C. Hewett, "Primary schooling in sub-Saharan Africa: Recent trends and current challenges."
- 175 James F. Phillips, Tanya C. Jones, Frank K. Nyonator, and Shruti Ravikumar, "Evidence-based development of health and family planning programs in Bangladesh and Ghana."
- 174 Geoffrey McNicoll, "Population and development: An introductory view."
- 173 Paul Demeny, "Population policy: A concise summary."
- 172 Zachary Zimmer, Napaporn Chayovan, Hui-Sheng Lin, and Josefina Natividad, "How indicators of socioeconomic status relate to physical functioning of older adults in three Asian societies."
- 171 Sajeda Amin and Nagah H. Al-Bassusi, "Wage work and marriage: Perspectives of Egyptian working women."
- 170 Ravai Marindo, Steve Pearson, and John B. Casterline, "Condom use and abstinence among unmarried young people in Zimbabwe: Which strategy, whose agenda?"
- 169 Zachary Zimmer and Julia Dayton, "The living arrangements of older adults in sub-Saharan Africa in a time of HIV/AIDS."
- 168 Paul C. Hewett, Annabel S. Erulkar, and Barbara S. Mensch, "The feasibility of computer-assisted survey interviewing in Africa: Experience from two rural districts in Kenya."