Men's Multiple Sexual Partnerships in 15 Sub-Saharan African Countries: Sociodemographic Patterns and Implications

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Abstract

Men's multiple sexual partnerships contribute to the spread of HIV in sub-Saharan Africa, but the social determinants of these relationships remain poorly understood. Prevailing wisdom suggests that men's institutionalized authority over women and their control of economic resources are key facilitators of multiple partnerships in this region. Men's exposure to or freedom from social control mechanisms embedded in family and village life may also play a role. This article provides insight into these issues by examining sociodemographic correlates of men's multiple sexual partnerships using data from recent Demographic and Health Surveys in 15 sub-Saharan African countries. The prevalence of self-reported multiple partnerships varies widely among countries. Sociodemographic patterns of such partnerships confirm the importance of men's control of economic resources and suggest that men's freedom from social control mechanisms may be more important than their authority over their wives.

Sub-Saharan Africa continues to bear the brunt of the global HIV pandemic. In 2007, an estimated 67 percent of the world's HIV infections, 66 percent of new HIV infections, and 71 percent of HIV-related deaths occurred in the region, and adult HIV prevalence in sub-Saharan Africa, currently estimated at 5 percent overall, vastly exceeds that in any other region of the globe (UNAIDS 2008). Substantial subregional variation exists in the severity of these epidemics; adult HIV prevalence is generally highest (>10 percent) in Southern Africa, lowest (<5 percent) in West Africa, and intermediate in Central and East Africa (Asamoah-Odei et al. 2004). Transmission of HIV in sub-Saharan Africa is predominantly heterosexual and is widely believed to be fueled by a combination of poverty, labor migration, and the subordinate status of women (Buvé et al. 2002). The individual, family, and population impacts of HIV in this region are staggering. HIV has more than doubled adult mortality rates and reversed decades of life-expectancy improvements in some areas (Notkola et al. 2004; Timæus and Jasseh 2004; Gregson et al. 2007). At the household level, the infection of an adult member may lead to loss of income, selling-off of capital assets, reduced investment in children's education and well-being, and ultimately orphanhood (Piot et al. 2001). Macroeconomic impacts of HIV in severely affected countries may include reduced GDP per capita and lowered economic growth (Dixon et al. 2004).

Several observations suggest that men's multiple sexual partnerships are critical to the spread of HIV in sub-Saharan Africa. First, epidemiological studies in the region have consistently found that having multiple sex partners is a robust risk factor for HIV infection transmission among women and men (see Chen et al. 2007 for a meta-analytic review). Second, the propagation of HIV depends both upon becoming infected and upon passing the infection to others (Aral and Holmes 1999), which obviously is facilitated by having

multiple partners. Accordingly, mathematical models of the population dynamics of HIV typically use the rate of partner change as the key behavioral parameter (Anderson 1999). Moreover, theoretical models suggest that the extent of concurrency of multiple partnerships in sexual networks may increase the potential for the aggressive spread of HIV (Morris and Kretzschmar 1997; Halperin and Epstein 2004). Finally, 60 percent of HIV infections in sub-Saharan Africa are among women (UNAIDS 2008), implying that, on average, each infected man transmits HIV to 1.5 women, whereas each infected woman infects only 0.67 men. For these reasons, the proportion of men aged 15–49 who have had sexual intercourse with more than one partner in the past 12 months is a UNAIDS core indicator for monitoring HIV epidemics and the progress of transmission-prevention campaigns (UNAIDS 2007). Partner reduction continues to occupy a central position in the multipronged "ABC" approach to HIV prevention (Shelton et al. 2004).

In order to be maximally effective, programs aimed at promoting partner reduction among men in sub-Saharan Africa should be informed by an understanding of the social determinants of men's multiple sexual partnerships in that region. Unfortunately, little research has been devoted specifically to this topic. This situation may be attributable in part to the focus on women's perspectives that emerged in the early 1990s and that continues to dominate social scientific thinking about HIV in Africa (Ankrah 1991; Carovano 1991; de Bruyn 1992; Ulin 1992). The understanding that emerges from this work can be summarized in three paradigmatic life narratives. In the first, a rural woman is married to a migrant laborer and, by virtue of the rules governing her role as wife, has little choice but to comply with her husband's wishes for unprotected sex when he returns home, even though she suspects that he has had other sex partners during his absence and may have become infected with HIV (for example, see Setel 1999: 78–83). In the second narrative, a destitute and socially isolated woman migrates to an urban area, a roadside settlement, or a mine and, finding no other options there, turns to formal or informal sex work to meet her most basic needs (Campbell 2000). More recently, a third narrative has emerged in which an adolescent girl concerned about her social status accepts money or other gifts from an older "sugar daddy" in exchange for sex (Silberschmidt and Rasch 2001; Luke 2003).

These narratives undoubtedly describe the circumstances of many African women and provide some insight into the social forces that motivate their risky sexual behaviors and limit their ability to take precautionary measures. They do not, however, consider men's perspectives in much detail. Rather, men play marginal and villainous roles in these narratives. Their desire for unprotected sex with multiple partners is simply taken for granted. Nevertheless, the narratives provide some tentative clues about social factors that may enable some men in sub-Saharan Africa to have multiple sex partners and prevent others from doing so. These factors can be grouped into two broad categories: institutionalized sources of men's authority over women and men's access to certain types of economic resources.

Men in sub-Saharan Africa exercise institutionalized authority over women in numerous domains, but the authority that husbands enjoy over their wives may be the most extensive and most relevant to HIV-risk behaviors. Social scientists have long recognized that the institution of marriage in sub-Saharan Africa, as it is traditionally practiced, involves the transfer of a comprehensive set of rights over a woman's domestic and agricultural labor and over her reproductive potential and sexuality from her natal family to her husband and his kin (Goody and Tambiah 1973; Lesthaeghe 1989). The authority of husbands over wives in sub-Saharan African societies is typically established through bridewealth payments and is reinforced by numerous other means, including patrilocal residence and the reliance of wives upon their husbands for access to agricultural land. To be sure, far-reaching social and economic changes such as the declining influence of kinship groups and the growing

importance of private landholdings and the cash economy have partially undermined the basis of husbands' authority over their wives and have led to the proliferation of alternative arrangements such as consensual unions (Meekers 1992). Observers familiar with the situation agree, however, that in the vast majority of cases, husbands continue to wield wide-ranging authority over their wives in sub-Saharan Africa (Adepoju and Mbugua 1997; Dodoo and Frost 2008).

Husbands' institutionalized authority over their wives has numerous implications for men's sexual behavior in sub-Saharan Africa, including their multiple partnerships. Most obviously, men who have two or more wives[1] will almost by definition have multiple sex partners except when they happen to be practicing postpartum abstinence. Moreover, men's authority over their wives may facilitate their multiple partnerships even in monogamous unions through at least two mechanisms. First, by providing an indisputable right of sexual access to one partner, marriage, in a sense, may free resources (for example, time, energy, and money) that men can use to establish additional partnerships. Second, and perhaps more importantly, husbands' authority places wives in a structurally disadvantaged position within the ongoing marital relationship, making it extremely difficult for wives to refuse sex, insist upon condom use, or confront their husbands about extramarital partnerships. This is the core of the "rural wife" narrative. Some scholars have recently pointed to divorce as a means by which some women in sub-Saharan Africa may remove themselves from this position and thereby protect themselves from becoming infected with HIV by their husbands (Smith and Watkins 2005; Reniers 2008). For many women in sub-Saharan Africa, however, divorce, although legally possible, is unappealing in practical terms because of the stigma and material suffering that it would bring upon them, their children, and their natal families.

Although marriage may be the most extensive source of men's institutionalized authority over women, it is not the only source. In other settings, male business owners and managers exercise authority over female employees, and male school administrators and teachers hold authority over female pupils. Scattered reports have documented instances of men in these positions using their authority to gain sexual access to women (for example, Dinan 1983; Mensch and Lloyd 1998), but it remains unclear how widespread these practices are.

Another factor that, according to prevailing wisdom, may facilitate men's multiple sexual partnerships in sub-Saharan Africa is their control of certain types of financial resources. Although some commentators continue to debate whether it is poverty or wealth that fuels the spread of HIV in Africa (Fenton 2004; Shelton et al. 2005), when it comes to men's multiple partnerships the reality may be more complex. Women's poverty, in absolute or relative terms, may motivate them to consider forming various types of sexual partnerships with wealthy men (Tawfik and Watkins 2007), but some types of wealth may be more relevant in such cases than others. Traditionally, the primary forms of wealth in African societies—cattle, access to agricultural land, and control of domestic and agricultural labor —were generally managed by kinship groups and were not available to individual men for their personal discretionary use (Iliffe 1995). Today, many sub-Saharan African men still eke out a living in the subsistence agricultural sector. By and large, the forms of wealth that these men control cannot readily be exchanged for sexual services except through the traditional avenue of marriage.

Some men, however, pursue livelihoods in the cash economy, working as wage laborers in mines or on plantations, selling cash crops to middlemen, producing and selling petty commodities in the informal sector, or providing services. Those who are successful in these pursuits may find themselves with cash that they control personally with little accountability

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[1]Polygyny remains widespread throughout the region despite legal, religious, and economic barriers to the practice.

to their immediate or extended families. These men, rather than wealthy men more generally, are the most likely to patronize sex workers, to establish ongoing transactional sexual relationships with multiple adult women, or to be involved in "sugar daddy" relationships with adolescent girls. Their unilateral control of highly fungible financial resources is a critical element—in combination with women's poverty and lack of alternative means of accessing resources—of the "sex worker" and "sugar daddy" narratives.

Beyond men's institutionalized authority over women and their control of economic resources, a third factor may influence their likelihood of having multiple sex partners in sub-Saharan Africa: the extent to which men are subject to or free from social control mechanisms embedded in family, village, and religious organization. This factor has received relatively little attention in the literature on HIV risk in Africa, perhaps because some prominent observers have suggested that social control mechanisms related to men's sexual behavior are weak or nonexistent in sub-Saharan African societies. Caldwell and his colleagues (1989) famously argued that few moral or legal restrictions are placed on men's sexual behavior in traditional African societies and that the current situation primarily reflects the persistence of permissive traditional values despite the spread of Islam and Christianity, Western-style education, and other changes. Those who take exception to this view (for example, Ahlberg 1994; Heald 1995) generally object to Caldwell's characterization of traditional African societies but appear to share his view of the current situation as being highly permissive with respect to men's sexual behavior. The impression has developed, therefore, that no effective social control mechanisms exist to be studied.

This idea is mistaken. Considerable evidence suggests that at least some men in present-day sub-Saharan Africa are subject to a set of rigid social controls that prohibit and severely sanction premarital and extramarital sex and, in many cases, polygyny. In many rural areas in the region, young men remain enmeshed in a rigid social order dominated by elder males. Such controls are often alluded to as a factor motivating young men to migrate from their rural homes to urban areas, where they often enjoy greater freedom—sexual and otherwise (for example, see Hunt 1989; Findley 1997: 124; Oppong 1997: 178). Moreover, in many areas these traditional mechanisms of social control have been augmented in recent years by the growing popularity of Christian, especially Pentecostal and Charismatic, churches in Africa (Gifford 2004; Meyer 2004). These churches have contributed to the spread in Africa of an ideology that equates personal respectability and success with behavioral adherence to a moral code that proscribes premarital sex, extramarital sex, and polygyny. Indeed, the combination of the small scale of village life, the concentration of authority in elder males, and the growing influence of these churches may make for a particularly restrictive regime with respect to sexuality. The facts that some men are more subject to these social control mechanisms than others and that some may actively seek to remove themselves from such controls only reinforce the importance of studying these mechanisms in relation to HIV-risk behaviors.

Thus, prevailing wisdom suggests that in sub-Saharan Africa, men who hold positions of institutionalized authority over women or who exercise unilateral control over fungible financial resources may be at increased risk for acquiring and transmitting HIV infection through multiple sexual partnerships. Furthermore, the prevalence of multiple partnerships may be higher among men who have escaped social control mechanisms embedded in family, village, and religious organizations. Yet the empirical basis for these possibilities remains surprisingly thin. Very little systematic research has been devoted to identifying the statistical correlates or sociodemographic patterns of men's multiple sexual partnerships in sub-Saharan African populations. Existing studies typically deal with specific subgroups of men (for example, those serving in the Angolan military: Bing et al. 2008) rather than with the general population, or focus on isolating the role of a single predictor variable (for

example, migration: Brockerhoff and Biddlecom 1999) rather than on the overall pattern. Such research clearly has value, but it leaves us without answers to such basic questions as: What proportion of men in sub-Saharan Africa have multiple sexual partnerships? Is this proportion fairly uniform or highly variable across countries, regions, and ethnic groups? Are men with multiple sex partners concentrated in certain identifiable subgroups defined, for example, by age, marital status, education, or type of employment? Is that sociodemographic pattern consistent or variable across countries? In what ways do these patterns support or contradict the prevailing wisdom about the importance of men's authority over women and their control of economic resources. Do the patterns implicate exposure to social control mechanisms? The aims of this article, therefore, are to provide a detailed description of the levels and sociodemographic patterns of multiple sexual partnerships among men in several sub-Saharan African countries and to assess the extent to which these patterns are consistent with the prevailing wisdom.

Data and Methods

There is no paucity of recent survey data on this topic. Self-reports of various aspects of sexual behavior, including multiple partnerships, are now routinely collected as part of dozens of localized epidemiological and social scientific research projects. On the national level, such information is collected using standardized instrumentation through the Demographic and Health Survey (DHS) program. Indeed, country-specific reports from this program provide tabulations of men's self-reports of multiple sexual partnerships according to a variety of sociodemographic variables. Yet several factors diminish the usefulness of these tabulations. First, they are scattered among country-specific reports, making a region-wide picture of the situation arduous to assemble. More important, for most countries the figures are broken down according to a limited number of variables, usually restricted to age, marital status, urban-versus-rural residence, education, and an index of household wealth. In many cases, diverse groups of men are lumped into single categories. Marital status is treated as a dichotomy of never-married versus ever-married men, which may obscure important variations among monogamously married, polygynously married, and divorced, separated, and widowed men. Finally, whereas for some countries all male respondents are included in the denominators for these tabulations, in other countries only sexually active men are included, making comparisons difficult or impossible.

In this article, these limitations are addressed by (1) bringing together DHS data from 15 sub-Saharan African countries, (2) applying an analytical approach that is consistent across countries, (3) using a larger number of sociodemographic background variables and a finer breakdown of response levels than are available in country-specific DHS reports, and (4) presenting the results in ways that convey the overall patterns of multiple sexual partnerships as well as the nature and extent of country-specific divergence from those patterns. For each country, I estimate the proportion of men reporting that they had two or more sex partners in the past 12 months, overall and by the following sociodemographic background variables: age, urban-versus-rural residence, education, employment, travel pattern, household wealth, marital status, and position within the household. I discuss the descriptive picture that emerges with reference to men's authority over their wives, their control of economic resources, and their freedom from social control mechanisms.

Sample

The 15 countries included in these analyses, together with the years in which the data were collected and the analytic sample sizes, are listed in Table 1. All DHS surveys of sub-Saharan African countries were included if (1) they were conducted during the period 2001–06; (2) they included a protocol for HIV testing; (3) permission to use the data could be obtained; and (4) sufficient information about the sampling design was available. Surveys

from five countries in the region (Chad, Congo, Eritrea, Madagascar, and Nigeria) were excluded because they did not include information about HIV testing. The Uganda 2004–05 survey was excluded because permission to use those data could not be obtained. The Zimbabwe 2005–06 survey was excluded because the available dataset did not contain variables that matched the description of the sampling design in the country report (Central Statistical Office [Zimbabwe] and Macro International 2007).

All surveys employed stratified, multistage cluster sampling designs. Typically, all enumerations areas were stratified according to region and urban-versus-rural status (the definition of urban varying slightly). Samples of enumeration areas were drawn from these strata with probability proportional to size. A sample of households was drawn within each sampled enumeration area, and interviews were attempted with all age-eligible men within these sampled households. (Age-eligible women were also interviewed, but their data are not considered here.) Thus, respondents are clustered in households and enumeration areas, are stratified by region and urban–rural status, and have unequal probabilities of selection. Across the 15 surveys, response rates for men ranged from 80 percent in Lesotho to 97 percent in Rwanda, with 89 percent being the average rate.

Most surveys included interviews with men aged 15–59, but some did not include men older than 49 years. For purposes of standardization, therefore, responses from those aged 50–59 are excluded from these analyses. Men who reported having more than one wife at the time of the interview are also excluded. Across surveys, polygynously married men constituted between 1 percent (in Rwanda) and 15 percent (in Guinea) of the total age-eligible sample of men, with a typical figure being around 5 percent. Not surprisingly, in virtually every country the proportion of men reporting multiple sex partners was substantially elevated among men with multiple wives, reaching as high as 87 percent among polygynously married men in Niger. These men are excluded from these analyses for two reasons. First, multiple partnerships in the form of polygynous marriage may not have the same epidemiological implications as do those in other circumstances, especially if the husband and all of his co-wives are uninfected at the time of marriage and if all refrain consistently from extramarital sex. (Of course, these conditions cannot be guaranteed.) Second, the social, economic, and other determinants of polygynous marriage may be different from the determinants of other forms of multiple partnerships. Formal polygyny may most often occur when a man follows well-established and socially accepted procedures such as setting up a new hut and accessing agricultural land for his new wife, paying bridewealth to her natal family, and so forth. Men in such cases may be motivated as much by economic and political considerations as by sexual desires. In contrast, other forms of multiple partnerships may be more likely to involve unilateral and often surreptitious action on the man's part, with little or no legitimization by family or community. Because of their different determinants and consequences, conflating polygyny and other forms of multiple sexual partnerships in a single outcome variable could produce confusing and misleading results.

Variables

In addition to a common sampling design, these DHS surveys also shared a highly standardized set of questionnaires, which were developed by the Measure DHS program at ORC Macro in Maryland (ORC Macro 2006). Separate versions were used for female and male respondents. Host-country agencies worked with ORC Macro to adapt the model questionnaire to local needs and circumstances, leading typically to only minor changes to the model questionnaire. The data were collected via face-to-face interviews by trained personnel operating within supervised field teams in sampled areas.

The focal variable for this article—having multiple sex partners in the 12 months prior to interview—is derived from a series of items in the questionnaire for men. Each respondent

was first asked whether he has ever had sexual intercourse and, if so, how old he was at his first experience of intercourse. If he reported ever having had sex, he was asked when the most recent sexual intercourse took place. If it took place within the past 12 months, the respondent was asked a series of detailed questions about as many as three recent sexual partnerships (for example, nature of relationship to the partner, duration of relationship, condom use, alcohol use with sex). Those reporting at least three partners were asked for their total number of partners in the past 12 months. Drawing upon this information, each DHS dataset for public use contains a derived variable representing the respondents' total number of partners in the past 12 months. I recoded this information into a dichotomous indicator of two or more partners. Men for whom data were missing for this variable were excluded from subsequent analyses, but the number of affected cases was low, ranging from just 2 otherwise eligible men in Burkina Faso, Kenya, and Zambia (0.1 percent in each case) to as many as 13 in Niger (0.5 percent).

Seven of the eight sociodemographic variables examined fall into one of three categories. In the first category is one variable—marital status—that I take to be primarily an indicator of men's authority over women. It is derived from a series of interview questions and takes four values: never married, currently married with one wife, cohabiting (unmarried but living with a partner), and formerly married. The last category includes men who are separated, divorced, or widowed; the numbers of such responses are insufficient to treat these three as separate categories. Men in a fifth category—currently married with more than one wife— are excluded from the analyses for the reasons described above. In the Cameroon and Tanzania surveys, no distinction was made between married and cohabiting men. In all 15 countries, the bulk of respondents were either never married (ranging from 37 percent in Malawi to 58 percent in Lesotho) or currently married to a single wife (ranging from 27 percent in Côte d'Ivoire to 59 percent in Malawi). Unmarried cohabiting men are typically a small minority, but constitute a more substantial fraction of the sample in two countries: Côte d'Ivoire (15 percent) and Rwanda (18 percent). This variation could be attributable to localized inconsistencies in how people regard marriages that are neither legally registered nor formalized by a church wedding or similar rite. The proportion of those who were formerly married ranges from 2 percent in Burkina Faso to 10 percent in Cameroon, with a typical value being around 4 percent.

The second category consists of three sociodemo-graphic variables—household wealth, education, and employment—that I take to be primarily indicative of men's unilateral control of fungible economic resources. Household wealth is represented by quintiles of the DHS Wealth Index (Rutstein and Johnson 2004). It is the first principal component derived from a set of socioeconomic indicators such as type of roof, floor, and walls of the residential structure; water source and toilet facilities; and ownership of consumer goods such as a radio, bicycle, and telephone. The indicators vary from country to country, as do the weights assigned to each, but in all countries households are divided into quintiles based upon their principal component score. Because quintiles are determined by household, and because of the positive correlation in Africa between wealth and household size, somewhat larger proportions of men fall into the wealthier quintiles than into the poorer ones. Education is divided into five ordered categories: no formal schooling, primary school not completed, primary school completed but respondent did not continue to secondary school, secondary school not completed, secondary school completed. The distribution of men among these categories varies widely across countries. The proportion with no formal schooling ranges from 5 percent in Zambia and Kenya to 64 percent in Niger; the proportion who completed secondary education ranges from 2 percent in Malawi to 26 percent in Kenya.

Employment consists of nine categories. The first three—unemployed, in school, and working in agriculture—are represented in all 15 countries and together comprise the

numerical majority of men in each case. The next five job categories—skilled manual labor; unskilled manual labor; sales; services; and professional, technical, and managerial positions —are represented in each country if at least 200 respondents fit into that category. These are the categories within which men would be most likely to have a substantial cash income over which they could exercise unilateral control. Men in categories with fewer than 200 respondents in a given country were assigned to the "other" category. The categories included and the distributions of men among the categories vary substantially across the 15 countries.

The final group of sociodemographic correlates contains three variables that I take to be primarily indicators of exposure to, or freedom from, social control mechanisms deriving from the family, village, and religious community. The first is "rural-versus-urban residence." The proportion of men residing in urban areas ranges from 16 percent in Ethiopia to 60 percent in Cameroon, but this variation may be partially attributable to definitional differences. The second variable, "travel away from home in the past 12 months," is determined both by the number of trips (zero, one to five, or six or more) and by their duration (all briefer than one month or at least one longer than one month). The result is a variable with five levels: no trips, a small number of short trips, a small number of trips some of which were long, a large number of short trips, and a large number of trips some of which were long. Information about travel away from home was not available for Cameroon, Mali, Senegal, and Tanzania. The proportion of respondents reporting at least some trips away from home ranged from 29 percent in Ethiopia to 58 percent in Ghana. Finally, the variable "social position in the household" groups respondents into five categories: those who are living alone, those who are the head of a two-person household, those who are the head of a larger household, sons and grandsons of household heads, and others. Country-specific distributions of all sociodemographic variables appear in Appendix Table A1.

Additionally, age is used in these analyses in two ways. First, I examined country-specific patterns of age-related variation in the proportion of men reporting multiple partners, using logistic regression models with dummy variables but no intercepts to obtain point estimates for percentages in the following age groups: 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49 years. Similar logistic regression models with intercepts and reference groups (the youngest category) were used to obtain omnibus statistical tests of the null hypothesis of no age-related variation. Age-related variations were found to be statistically significant at the $p \leq 0.05$ level in all countries except Niger. In some countries, the prevalence of multiple partnerships appeared to increase monotonically with age; in others, the pattern was an upside-down U-shape, with peaks ranging between the mid-20s and early 40s. Further details are not presented here but are available upon request from the author. Age also serves as a control variable in multiple logistic regression models, as discussed below. In those models, I use age in years centered at 30, as well as the square of that variable.

Analyses

Consistent with the goals of (a) presenting a detailed picture of the sociodemographic patterns of men's multiple sexual partnerships in sub-Saharan Africa and (b) assessing the extent to which that picture is consistent with the prevailing wisdom about the importance of men's institutionalized authority over women and their control of economic resources, the analysis is limited to bivariate and age-adjusted associations. These associations are assessed on a country-by-country basis and are presented graphically in a way that reveals the overall patterns while not obscuring country-specific deviations from those patterns. Logistic regression with dummy variables and linear and quadratic age terms is the primary analytical tool, providing omnibus statistical hypothesis tests as well as point estimates for proportions and odds ratios. All statistics are derived from analyses that take into account

the unequal probabilities of selection as well as the design effects resulting from stratified and multistage cluster sampling (Levy and Lemeshow 1999).

For each sociodemographic variable—marital status, wealth index, education, employment, residence, travel pattern, and position in the household—I use logistic regression models with dummy variables and age and age-squared terms to obtain point estimates for age-adjusted odds ratios, as well as omnibus tests of the null hypotheses of no associations net of age. The country-specific reference groups are: men aged 15–19 years, never-married men, men in the poorest wealth-index quintile, men having no formal schooling, men working in agriculture, rural residents, men who head households of at least three people, and men reporting no travel away from home. For each sociodemographic variable, I tabulate (or, in the case of employment, graph) the odds ratios. (I also ran the same analyses with no age controls, but present only the age-adjusted results here. With two exceptions, discussed below, the results of the unadjusted and age-adjusted analyses are statistically similar and substantively identical.)

No technical impediment prevents the inclusion of all of the sociodemographic variables simultaneously in a single logistic regression model, and undoubtedly many investigators would include them all. In my view, however, the resulting estimates would be difficult to interpret because of ambiguity in the causal ordering of those variables. When measuring the effect on some outcome of a specific independent variable, model specification may be guided by the following rule of thumb: control for confounders but not for mediators or joint outcomes (Hernán et al. 2002; Glymour 2006). Confounders, by definition, generate spurious associations between independent and dependent variables, but the resulting bias can be eliminated in principle or reduced in practice by including those confounding variables in the statistical model. By contrast, including mediators or joint outcomes in a statistical model can have the effect of introducing rather than reducing bias. In some settings, mediators and joint outcomes can be distinguished from potential confounders on the basis of a longitudinal design; in other instances, the distinction can be made with some confidence on purely theoretical grounds. Those conditions do not pertain here, however. Although a case could be made, for example, that the causal influence of household wealth occurs prior to marriage (because wealthy men have a greater ability to attract a wife and to pay brideprice), an alternative case can be made that the effect of marriage occurs prior to that of household wealth because husband and wife both contribute income to the household, or because marriage leads to reproduction (and older children contribute financially to the household), or for other reasons. In such a context, statistically controlling for household wealth does not necessarily reduce, and could just as well increase, bias in the estimated effect of marriage. This reasoning applies all the more when a large number of variables are included in a single model without a compelling case in support of a specific causal ordering. The effect of age is an exception because it cannot readily be regarded as occurring after any of the other sociodemographic variables considered here.

Results and Discussion

Table 1 shows the extent of variation between countries in the proportion of men reporting that they have had two or more sex partners in the 12 months prior to being interviewed. The variation is vast. It ranges from 1 percent in Ethiopia to 28 percent in Cameroon. Interestingly, no obvious correlation is found at the country level between the prevalence of multiple partnerships and the severity of the HIV pandemic. Hard-hit Southern African countries appear at the low and high ends of the range (Malawi and Lesotho, respectively), as do West African countries with much milder HIV epidemics (Niger at the low end and Guinea toward the high end of the range). This finding may be explained, at least in part, by regional variations in the prevalence of male circumcision. Other scholars (Oppong and

Kalipeni 2004: 48–49) have criticized the tendency of investigators working in specific areas of sub-Saharan Africa to generalize their findings to the entire region. These data reinforce that point. Clearly, region-wide generalizations about the prevalence of multiple sexual partnerships among men in sub-Saharan Africa would be misleading and counterproductive. Moreover, not only does the level of multiple partnerships vary among countries but also the sociodemographic patterns of those partnerships vary, as discussed below.

Men's Authority over Their Wives

The view that men's multiple sexual partnerships in sub-Saharan Africa are attributable mainly to their authority over their wives leads to the hypothesis that married men would be more likely than their unmarried counterparts to have multiple partners. This hypothesis, however, receives little support from the data presented in Table 2. Net of age, in only one country (Tanzania) are monogamously married men more likely than never-married men to report multiple partners. (In Tanzania, the group labeled monogamously married includes men who, in other country surveys, would be classified as unmarried but cohabiting.) In contrast, in five countries (Burkina Faso, Côte d'Ivoire, Guinea, Mali, and Niger), multiple partnerships are significantly less common among monogamously married men than among never-married men, net of age. In the remaining nine countries, point estimates are generally below the null value of one but by too small of an amount to be statistically significant.

These findings do not imply that husbands' authority over their wives never facilitates multiple partnerships. Numerous married men report having multiple partners, and some of those partnerships might have been averted had husbands wielded less authority over their wives. At the same time, most monogamously married men clearly do not, in any given year, have multiple sex partners. This situation may be the result of countervailing mechanisms by which marriage discourages multiple partnerships. The obligation for husbands to provide materially for a wife and children may leave married men with few resources to direct toward establishing or maintaining extramarital partnerships. Having ready sexual access to his wife may diminish a husband's motivation to seek additional partners. The threat of legal or physical intervention by in-laws also may discourage some men from forming extramarital partnerships. That the prevalence of multiple partnerships is almost nowhere elevated among monogamously married men relative to their never-married counterparts suggests that these countervailing mechanisms often outweigh the effects of husbands' authority over their wives. In the absence of more detailed information, however, this conclusion remains speculative.

Also noteworthy in Table 2 is the high prevalence of multiple partnerships among unmarried but cohabiting men in many countries. In most countries, few men were categorized as unmarried but cohabiting, making statistically significant differences less likely to be obtained. Nevertheless, the data appear to suggest that multiple sexual partnerships are more common in this group than among never-married men. Almost all of the point estimates exceed the null value of one, and in three of these countries (Côte d'Ivoire, Rwanda, and Senegal) these differences are statistically significant. A number of reasons can be suggested as to why the prevalence of multiple partners could be elevated in this group. One is that these are new relationships, perhaps headed toward marriage in many cases, and that the additional partnerships occurred before these relationships began or solidified. Another possibility is that, relative to formalized marriages, these informal unions are less subject to family- and community-based social control mechanisms. This would be the case, for example, if nonmarital cohabiting relationships disproportionately occur away from both partners' communities of origin, so that they are, in effect, the concern only of the cohabiting parties rather than matters that involve the interests of other family and community

members. In the absence of more detailed information, this interpretation also remains speculative.

Finally, Table 2 shows that the prevalence of multiple sex partners is significantly elevated among formerly married (widowed, separated, or divorced) men in four countries: Cameroon, Kenya, Tanzania, and Zambia. Several interpretations of this finding are possible. One is that, in some instances, the desire among these men to have multiple partners led the men into this "formerly married" group in the first place. Wives may have separated from or divorced some of these men as a result of conflict arising from the men's multiple partnerships. In other cases, husbands may have become infected with HIV as a result of their multiple partnerships and may have passed the infection along to their wives who, in some cases, succumbed to the infection while their husbands remained healthy. Another possibility is that this category contains men for whom economic resources and social status are joined in a way that confers upon them relative freedom from social controls. Some light could be shed on these issues by an analysis that divides the "formerly married" group into subgroups of separated, widowed, and divorced men and that also takes their HIV status into account. Unfortunately, the sample sizes available in these surveys are too small to support a reliable analysis of this type.

Control of Economic Resources

The view that unilateral control of fungible economic resources enables some men to form multiple sexual partnerships leads to the hypothesis that multiple partnerships would be more common among men living in wealthy households, men with high levels of formal schooling, and men employed in the cash sector of the economy. Table 3 presents results with respect to quintiles of the DHS wealth index. At first glance, these figures appear broadly but not universally consistent with the expectation that, as household wealth increases, the prevalence of men's multiple sexual partnerships will increase. With a move from the second ("poorer") to the fifth ("richest") quintile, the point estimates for the age-adjusted odds ratios tend to increase. At the country level, if we limit our attention to countries with statistically significant (at the $p \leq 0.05$ level) omnibus hypothesis tests, we find two patterns. In the first pattern, the age-adjusted prevalence of multiple partnerships increases more or less smoothly as we move upward through the quintiles. This pattern characterizes Cameroon, Côte d'Ivoire, Ghana, and Niger. In the second pattern, evident in Burkina Faso and Senegal, an increase in the age-adjusted prevalence of multiple partnerships appears only in the highest ("richest") quintile of households. This pattern might be termed a threshold effect. In the remaining seven countries (Ethiopia, Guinea, Kenya, Lesotho, Malawi, Rwanda, and Tanzania), any relationship between household-wealth quintile and the prevalence of men's multiple sexual partnerships is not statistically significant at the $p \leq 0.05$ level, according to omnibus tests.

Why household wealth is not more strongly or consistently related to the prevalence of men's multiple sexual partnerships is not clear. One possibility is that household wealth is not identical to unilateral control of fungible economic resources. Many of the indicators in the index—for example, cement floors and running water—are not especially fungible. Even when items are readily transferable—for example, a television or bicycle—they may often be regarded as household rather than individual property or as the individual property of household members other than the focal respondent. Moreover, the mixture of items included in the index and the distribution of men's positions within the household vary from country to country. These methodological complexities could account for some of the weakness and inconsistency in the findings with respect to the DHS wealth index. The relationship between household wealth and the prevalence of men's multiple sexual partnerships is strongest and most consistent in West African countries, where HIV prevalence generally remains lower than in East or Southern Africa. Plausibly, this finding

could be attributable to reductions in multiple partnerships among wealthier (and perhaps better-informed) men in high-prevalence but not low-prevalence settings.

Findings with respect to education appear in Table 4. As with household wealth, the overall pattern appears broadly but not universally consistent with the hypothesis that the prevalence of men having multiple sexual partnerships rises with their increasing education. In seven countries, an omnibus statistical test leads to rejection of the null hypothesis of no educational variations in the prevalence of multiple partners at the $p \leq 0.05$ level, net of age. In four of these countries—Burkina Faso, Cameroon, Ghana, and Mali—point estimates of the age-adjusted odds ratios increase consistently with rising education. In the other three countries—Côte d'Ivoire, Niger, and Senegal—the tendency is for the estimated odds ratios to increase with education, but with some minor departures from that pattern. In Niger, for example, the age-adjusted odds ratios skip from 2.65 among men who have a complete primary education but who did not complete secondary school, down to 1.92 before increasing again to 5.34 among those who had completed secondary school. In the remaining eight countries, omnibus hypothesis tests were not statistically significant at the $p \leq 0.05$ level, and patterns in the point estimates of the age-adjusted odds ratios are more complex and less often consistent with the view that more education leads to increases in numbers of sex partners.

As with household wealth, several reasons may be posited to suggest why education is not more consistently associated with the prevalence of men's multiple partnerships in the expected way. One is simply that formal schooling does not always translate into access to financial resources. Another possibility is suggested, however, by the pattern of country variations. All seven of the countries yielding patterns consistent with the hypothesized effect of education are found in West Africa, where HIV prevalence is low. Education may have countervailing effects operating through different mechanisms, the balance of which depends upon HIV prevalence. First, formal schooling may, as hypothesized, increase men's access to financial resources and thereby enable them to acquire multiple sex partners. At the same time, men with more schooling may have better access to information about HIV transmission and prevention, or they may have more cognitive resources for processing that information, and may consequently be more likely than less-educated men to take precautions such as reducing their number of sex partners. In the low-prevalence settings of West Africa, the former mechanism may dominate, so that the prevalence of multiple partnerships increases strongly and consistently with education. In settings with higher prevalence of HIV such as those of East and Southern Africa, the second mechanism may be more important, causing the positive association between education and the prevalence of multiple partnerships to be reduced, eliminated, or even reversed. This interpretation is speculative but is consistent with the overall pattern of findings, and with the observation that the positive association between education and HIV risk in sub-Saharan Africa has diminished and, in some places, reversed over time (Hargreaves and Glynn 2002).

Results involving employment and occupation appear in Figure 1. I take five occupational categories as being indicative of access to cash income: sales; skilled manual labor; professional, technical, or managerial work; unskilled manual labor; and services. Consistent with the hypothesis that having a cash income facilitates men's having multiple sexual partnerships, almost all of the age-adjusted odds ratios for these categories exceed the null value. In many cases, these effects are statistically significant, as shown by the corresponding confidence intervals. The prevalence of multiple sexual partnerships is significantly elevated for at least one of these occupational categories relative to agricultural workers (who are mostly self-employed and would often have little or no cash income) in nine countries: Burkina Faso, Côte d'Ivoire, Ghana, Kenya, Lesotho, Mali, Rwanda,

Senegal, and Zambia. Rarely do the point estimates associated with these categories fall short of the null value, and in no case is a negative effect statistically significant.

Also included in Figure 1 are the categories for men who are unemployed and in school. In most countries, no statistically significant difference is found between the prevalence of multiple sex partners among unemployed men and that among men working in agriculture. Where differences between these groups exist, net of age, unemployment is associated with a reduced prevalence of multiple partnerships in one country (Tanzania), and with an increased prevalence in four countries (Cameroon, Côte d'Ivoire, Ghana, and Mali). Some investigators have suggested that men in some parts of sub-Saharan Africa find unemployment to be an emasculating state, and in some cases may use sex with multiple partners as a way of reasserting their masculinity (Silberschmidt 2005). This behavior could explain not only why unemployment is positively associated with men's multiple sexual partnerships in some countries, but also why it is not more often negatively associated with multiple partnerships, as the "control of financial resources" hypothesis would lead one to expect. In Figure 1, net of age, being still in school is associated in many countries with a greatly reduced likelihood of men's reporting multiple sexual partnerships. Such effects are found in Ethiopia, Kenya, Lesotho, Malawi, Tanzania, and Zambia. Interestingly, these are all of the East and Southern African countries in the group studied; the effects of being in school on the probability of men's reporting multiple sexual partnerships are null in most West African countries and positive in one (Côte d'Ivoire). Ethnographic work in rural Tanzania has documented a normative expectation of sexual abstinence among both male and female students (Wight et al. 2006). That norm could be widespread throughout the East African region and could account for the low prevalence of self-reported multiple sexual partnerships among males who are currently in school.

Exposure to Social Control Mechanisms

The view that exposure to social control mechanisms operating within family and village life limits men's ability to have multiple sexual partnerships in sub-Saharan Africa, or conversely that escape from these mechanisms enables some men to establish such partnerships, leads to several hypotheses. The first, based on the assumption that these social control mechanisms are weaker in urban than in rural areas, is that multiple partnerships (other than polygynous marriages) will be more common among men residing in urban areas than among their rural counterparts. This hypothesis receives some support, as shown in the first panel of Table 5. Statistically significant (at the p ≤ 0.05 level) urban–rural variations in the proportion of men reporting multiple partnerships, net of age, are found in 7 of the 15 countries, and all of these variations are in the expected direction. The age-adjusted odds ratios are especially high in the landlocked, Sahelian, and highly Islamized countries of Burkina Faso, Mali, and Niger in West Africa, but significant differences are found in East and Southern African countries as well. Point estimates in 6 of the 8 remaining countries are in the expected direction, and no countries show statistically significant elevations in the prevalence of multiple partnerships in rural relative to urban residence.

The second panel of Table 5 shows results with respect to men's position within the household. The "exposure to social control mechanisms" view leads to two hypotheses related to this variable. The first is that the prevalence of multiple sexual partnerships will be elevated among men who are living alone. This hypothesis follows from the notion that the effectiveness of family-based social control mechanisms depends heavily upon the ability of family members to monitor one another's whereabouts and activities in the course of their routine activities. Such informal surveillance will usually be easier when family members live together than when they live apart. The results are broadly consistent with this view. Relative to men who are heads of large households (three or more people), and net of age, men who are living alone are more likely to report having multiple sex partners in 13 of the

15 countries, and these differences are statistically significant in 11 countries. Point estimates of the age-adjusted odds ratios are also relatively large, typically falling between two and three. This result is found in countries in all parts of the region: West, East, and Southern Africa alike.

A second hypothesis concerning men's position in the household is that the prevalence of multiple partnerships will be reduced among men who are the sons or grandsons of the head of their household. This hypothesis is motivated by the expectation that such men would usually be subject to the informal surveillance of other members of their household, and by the widely recognized importance of seniority as a component of social status in African societies. That is, men who are not yet heads of their own households and who continue to reside with a male head of household—a father or paternal grandfather in patrilineal societies, and sometimes a maternal uncle in matrilineal ones—would generally have fairly low status within the household and would be regarded in the broader community as boys rather than as adult men regardless of their chronological age (Barker and Ricardo 2005). To be sure, to some extent social changes have undermined the authority of senior men over juniors (Miescher and Lindsay 2003), but in most areas a substantial vestige of the seniority-based allocation of authority and status remains.

Although unconditional analyses (not shown but available on request from the author) provided some evidence of reduced prevalence of multiple sexual partnerships among sons and grandsons of household heads in several countries, that relationship is eliminated and in some cases reversed by controlling for age. As Table 5 shows, net of age, no statistically significant difference is found in the probability of men's reporting multiple sexual partnerships in 11 of the 15 countries. In fact, point estimates of the age-adjusted odds ratios are more commonly found to be in the opposite direction, and in four countries—Cameroon, Mali, Niger, and Tanzania—this finding is statistically significant. A number of explanations of this finding are plausible. One is that sons and grandsons should be regarded as a group of men who lack the stable and socially legitimized avenue of marriage as an outlet for the satisfaction of sexual desires, and who in some cases pursue other opportunities for sexual satisfaction that are less stable, in part because they lack the social legitimization of marriage. This interpretation is speculative but broadly consistent with the finding (shown in Table 2) that in many countries, net of age, monogamously married men are less likely then their never-married counterparts to report having had multiple partners in the past year.

A final hypothesis related to men's exposure to social control mechanisms involves their travel away from home. The basic notion is that, when men are at home, their activities and whereabouts are subject to informal surveillance by family members and neighbors. Travel away from home provides freedom from such surveillance, facilitating the formation of multiple partnerships by providing men with opportunities to meet more women while also reducing the risk that those partnerships would be detected by family members or neighbors. The probability of having multiple sexual partnerships is, therefore, expected to increase with the amount of time men spend traveling away from home. Time away from home is operationalized here in terms of both number of overnight trips (zero, fewer than five, or five or more) and the duration of those trips (all shorter than one month versus one or more trips lasting a month or longer).

As shown in Table 6, the prevalence of multiple sexual partnerships is substantially elevated among men who traveled away from home during the past year relative to men who made no trips. Net of age, travel-related variation in the proportion of men reporting multiple partners is statistically significant at the $p \leq 0.05$ level in 9 of the 11 countries for which travel data were available. Almost all (39 of 44) of the estimated age-adjusted odds ratios

are in the expected direction, and a large majority (32) are significantly so. None is statistically significant in the direction opposite to that indicated by the hypothesis. Moreover, the estimated odds ratios tend to grow larger as the number and length of the trips increase. A typical point estimate for the age-adjusted odds ratio of multiple sex partners among men making between one and five short trips is around two, whereas among men making six or more trips, some of them long, many of the odds ratios exceed three. Thus, the finding that more travel (in terms of number of trips, duration of trips, or both) is associated with an increased prevalence of multiple sexual partnerships is among the strongest and most consistent patterns revealed by these data.

Limitations of the Study

Several limitations of the research design and methodology should be borne in mind when interpreting these findings. Perhaps the most important limitation follows from the self-reported nature of the data. HIV epidemiologists and social and behavioral scientists share a healthy skepticism of the accuracy of self-reports of sexual and other sensitive behavior (Aral and Peterman 1996; Fishbein and Pequegnat 2000; Cleland et al. 2004). Some refuse to study self-reported sexual behavior, preferring instead to use perceived risk of HIV infection as a proxy variable (Smith and Watkins 2005). Underreporting of multiple sexual partnerships may be less severe among men than among women (Nnko et al. 2004), which mitigates this limitation to some extent. More insidious than the possibility of overall underreporting (or overreporting), however, is that of differential misreporting. For example, married men generally may underreport extramarital partnerships, whereas never-married men may tend to exaggerate their sexual experiences. Such differential misreporting potentially may distort the results and may be more likely to distort results with respect to certain sociodemographic variables (for example, marriage) than others (for example, travel pattern).

Another limitation is that only one component of behavioral risk for HIV transmission—namely, multiple sexual partnerships—is examined here. Other important components include type of partner, frequency of intercourse, and condom use. These other aspects of behavioral risk for HIV may not have the same sociodemographic correlates as multiple partnerships. For example, although results presented here show that in many countries the prevalence of multiple partnerships increases with education, condom use may also increase with education, with ambiguous implications for the overall relationship between education and HIV risk. Obtaining a complete picture of the social contexts of men's behavioral risk for HIV acquisition and transmission in sub-Saharan Africa would require addressing all major components of behavioral risk and their potentially complex and contradictory relationships with sociodemographic variables. The work presented here is one step in that direction. Other work will be necessary. In the meantime, care should be taken not to equate having multiple sex partners with HIV risk.

A third limitation involves the issue of concurrency. Investigators have argued on the basis of network theoretical considerations and the findings of simulation studies that not merely the number of partnerships in a population but also the extent to which partnerships are concurrent as opposed to serial determine how aggressively HIV spreads (Morris and Kretzschmar 1997). Therefore, knowing how prevalent concurrent partnerships are in various populations would be useful, as would knowing what sociodemographic variables are correlated with concurrent partnerships. Unfortunately, until recently the questions included in most DHS questionnaires were insufficient to permit unambiguous conclusions about the concurrent or serial status of two or more partnerships reported by respondents. Indeed, the DHS program has been criticized on this point (Cleland et al. 2004), and the most recent surveys have used an updated questionnaire that includes more detailed

information on the timing of partnerships. Most of the surveys used here, however, did not include these updated questions; thus, I was unable to distinguish concurrent from serial partnerships.

A final limitation is that no one-to-one relationship exists between the three constructs considered here: men's authority over women, their control of economic resources, and their exposure to or freedom from social control mechanisms. These constructs do not have simple one-to-one relationships with the sociodemographic variables available from the DHS datasets. Marriage, for example, is not identical to authority over women. Some husbands may have little authority over their wives (Cornwall 2003), whereas other men may exercise considerable authority over women outside of marriage. Likewise, household wealth, education, and occupation are imperfect proxies for men's control of fungible economic resources, and urban residence, living arrangements, and travel patterns are incomplete indicators of men's exposure to social control mechanisms. More direct measures of some of these constructs are available but also have their limitations. Husbands' and wives' reports of roles in household decisionmaking in various domains may provide a (partial) basis for a more direct assessment of men's authority over their wives, for instance, but would fail to capture men's authority over women in other institutional settings such as the workplace. A series of survey questions that would assess men's control of fungible economic resources would be easy to devise. To my knowledge, however, such questions are not currently part of any major epidemiological or social scientific research program being conducted in the region. Meanwhile, the assessment of men's exposure to social control mechanisms would, presumably, be a more complex enterprise, requiring detailed knowledge of what those mechanisms are and how they operate in various settings. The development of such assessments, and the requisite descriptive knowledge on which they could be based, is one promising avenue for future research.

Conclusion

The data presented here highlight the heterogeneity of men's self-reported sexual behaviors in sub-Saharan Africa. At the country level, the proportion of men reporting that they have had two or more sex partners in the past 12 months ranges between 1 percent in Ethiopia and 28 percent in Cameroon. Sweeping generalizations about the sexual behavior of men in sub-Saharan Africa are, therefore, to be avoided.

The sociodemographic patterns of multiple partnerships within countries provide considerable support for the view that men's exposure to (or escape from) family-and village-based social control mechanisms plays an important role in determining the likelihood that they will have multiple sex partners. Such partnerships are more common among urban residents, men who live alone, and men who spend considerable time traveling away from home. Patterns also provide some support for the importance of men's control of fungible financial resources. In several countries, men residing in wealthier households, men with higher levels of education, and men with wage-paying jobs are more likely to report having multiple sex partners. In contrast, little support is garnered for the hypothesis that men's authority over their wives is of primary importance. Multiple partnerships are less common among monogamously married men than among never-married men in most countries. This finding does not imply that husbands do not commonly have wide-ranging authority over their wives in sub-Saharan Africa; nor does it mean that increasing women's autonomy or authority would fail to generate reductions in multiple partnerships. It does indicate, however, that other marriage-related factors, perhaps including social controls of husbands' extramarital sex, must also be considered.

Additional research should be conducted to delineate the nature of formal and informal social control mechanisms relevant to men's multiple sexual partnerships and other sexual practices in sub-Saharan Africa. Programs intended to reduce the spread of HIV and other sexually transmitted infections through behavior change may be able to build upon, enhance the effectiveness of, or operate synergistically with those mechanisms. The promise of such approaches can only be realized fully, however, if informed by a rich understanding of these complex, multilevel, potentially countervailing, and fundamentally local social processes.

Acknowledgments

Appendix

Table A1

Percentage distribution of study respondents, by eight sociodemographic characteristics, according to country

Variable	Burkina Faso	Cameroon	Côte d'Ivoire	Ethiopia	Ghana	Guinea	Kenya	Lesotho	Malawi	Mali	Niger	Rwanda	Senegal	Tanzania	Zambia
Age															
15–19	31.0	26.8	20.9	25.2	25.9	28.9	26.6	30.3	22.2	25.6	22.8	25.2	29.4	25.2	24.4
20–24	19.8	20.7	21.8	20.1	15.8	20.9	21.1	20.5	19.9	17.6	17.8	21.6	20.4	18.8	18.3
25–29	14.8	17.3	18.3	13.9	17.0	12.8	15.5	15.1	20.9	16.4	16.5	14.4	16.6	17.3	18.6
30–34	12.3	12.4	13.6	13.7	13.9	11.7	12.2	11.9	14.9	14.0	13.0	11.5	11.6	13.9	13.8
35–39	9.6	9.2	11.1	11.6	10.5	11.4	11.2	9.2	8.8	10.8	10.8	10.0	8.2	11.0	11.6
40–44	6.3	7.3	8.0	8.3	8.5	8.0	8.5	6.5	8.2	9.3	9.9	9.0	8.2	7.7	8.1
45–49	6.1	6.4	6.4	7.3	8.4	6.4	4.9	6.4	5.2	6.3	9.2	8.3	5.5	6.1	5.3
Marital status															
Never married	53.8	46.3	52.1	45.7	47.7	50.5	50.1	57.5	37.0	46.5	40.8	50.1	55.8	43.7	41.5
Currently married	40.6	44.3	26.5	50.8	41.1	38.6	44.7	36.7	58.9	47.9	56.5	29.9	33.4	50.5	52.4
Unmarried cohabiting	3.7	na	15.2	0.5	5.2	5.2	1.0	0.2	0.9	3.2	0.2	17.7	6.8	na	0.4
Formerly married	1.8	9.5	6.2	3.0	6.1	5.6	4.3	5.5	3.2	2.5	2.5	2.2	4.0	5.8	5.6
Household wealth															
Poorest	15.1	12.3	16.6	18.0	15.9	14.7	14.3	16.2	12.3	na	13.6	18.0	14.0	15.5	na
Poorer	18.7	16.2	18.6	19.1	17.7	15.9	17.0	17.9	19.6	na	17.0	18.0	13.7	18.8	na
Middle	20.8	18.7	20.2	17.6	19.3	16.3	18.6	20.1	21.2	na	20.9	20.2	17.7	18.4	na
Richer	14.8	23.7	21.1	19.9	22.1	19.8	22.2	22.5	21.2	na	19.1	20.4	22.9	20.8	na
Richest	30.6	29.2	23.6	25.4	25.1	33.4	27.9	23.2	25.7	na	29.4	23.4	31.6	26.4	na
Education															
None	59.9	8.2	32.9	39.3	14.2	43.2	4.9	14.6	10.5	60.2	63.9	16.3	38.5	10.9	4.7
Primary/incomplete	11.1	20.1	22.4	31.6	11.1	17.7	34.4	41.8	52.5	13.4	17.1	58.4	26.6	19.7	28.6
Primary/complete	8.5	16.0	3.0	7.3	5.8	1.3	22.9	13.8	9.0	3.7	2.2	12.5	3.2	58.0	21.3
Secondary/incomplete	14.4	45.9	32.7	15.6	52.4	31.5	11.4	20.4	25.7	17.6	13.1	8.9	25.9	8.3	28.7
Secondary/complete	6.1	9.9	9.0	6.2	16.5	6.4	26.4	9.4	2.3	5.1	3.6	3.8	5.8	3.1	16.7
Employment															
Unemployed	23.5	8.5	11.3	3.8	8.5	7.3	9.1	37.6	29.4	13.7	31.8	37.2	20.1	5.1	18.9
In school	8.9	24.1	17.3	12.1	19.5	25.9	21.1	22.9	16.6	12.2	6.2	12.0	17.0	13.4	15.9
Agricultural	44.0	27.5	35.5	70.8	34.8	35.0	29.0	20.8	26.9	41.0	24.7	30.9	14.5	52.6	34.6

Variable	Burkina Faso	Cameroon	Côte d'Ivoire	Ethiopia	Ghana	Guinea	Kenya	Lesotho	Malawi	Mali	Niger	Rwanda	Senegal	Tanzania	Zambia
Sales	7.1	na	7.6	5.6	5.5	8.5	8.1	na	7.8	9.9	11.3	na	10.3	12.9	na
Skilled manual	na	na	na	2.8	18.3	15.2	na	8.7	8.5	8.4	12.9	5.2	28.4	9.3	9.6
Professional, technical, managerial	na	na	7.8	2.1	7.1	na	6.3	na	na	8.5	na	na	6.5	na	na
Unskilled manual	na	14.8	13.5	na	na	na	15.2	na	na	na	na	7.6	na	na	na
Services	na	8.6	na	na	na	na	na	na	na	na	5.6	na	na	na	11.0
Other	16.4	16.5	7.1	2.9	6.2	8.1	11.2	10.0	10.8	6.3	7.6	7.0	3.2	6.7	10.0
Residence															
Urban	27.8	59.8	47.8	16.0	46.5	44.0	25.6	22.3	21.9	37.2	28.0	17.9	58.7	31.1	41.5
Rural	72.2	40.2	52.2	84.0	53.5	56.0	74.4	77.7	78.1	62.8	72.0	82.1	41.3	68.9	58.5
Travel pattern															
No trips	60.5	na	51.3	71.3	42.4	52.5	51.9	61.3	65.0	na	45.8	75.6	na	na	47.7
1–5 trips, <1 month	16.8	na	22.6	18.4	28.1	23.9	22.2	15.3	18.6	na	16.4	14.5	na	na	28.4
1–5 trips, >1 month	14.3	na	14.3	5.2	14.4	15.2	12.4	13.7	9.0	na	31.0	6.6	na	na	14.8
6+ trips, <1 month	5.5	na	7.4	4.1	10.0	5.6	9.0	4.6	4.9	na	3.5	2.1	na	na	6.9
6+ trips, >1 month	2.9	na	4.4	1.0	5.1	2.9	4.5	5.2	2.5	na	3.2	1.2	na	na	2.3
Household position															
Living alone	3.4	10.7	7.2	1.8	16.8	2.8	8.9	6.9	5.3	5.1	2.7	3.9	2.3	4.2	2.5
Head of 2-person household	4.6	6.2	4.7	3.8	5.1	3.4	4.5	4.1	5.8	5.2	2.9	4.1	1.3	4.3	3.8
Head of 3+ person household	35.3	31.3	30.3	45.9	34.4	30.1	34.9	24.0	51.7	42.0	43.9	45.8	14.3	41.0	47.1
Son/grandson of household	41.3	27.9	26.3	38.0	32.8	42.4	38.6	52.7	23.3	30.3	39.4	34.0	45.4	32.7	25.9
Other	15.4	23.8	31.5	10.5	10.9	21.2	13.1	12.3	13.9	17.3	11.1	12.3	36.7	17.8	20.6

na = not available.

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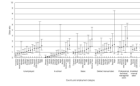
Figure 1.
Age-adjusted odds ratios (point estimates) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to employment status (reference category = agricultural workers)

Note: For all countries, the reference group is men working in agriculture. The proportion of men working in agriculture reporting multiple sex partners and omnibus tests of the null hypothesis of no employment-category variation in the proportion reporting multiple partners, by country, are as follows. **Burkina Faso:** 12.58, p = 0.0000. **Cameroon:** 31.21, p = 0.0000. **Côte d'lvoire:** 21.15, p = 0.0021. **Ethiopia:** 1.80, p = 0.0141. **Ghana:** 10.57, p = 0.0018. **Guinea:** 27.59, p = 0.8182. **Kenya:** 9.88, p = 0.0000. **Lesotho:** 24.35, p = 0.0001. **Malawi:** 7.36, p = 0.1595. **Mali:** 10.30, p = 0.0015. **Niger:** 1.31, p = 0.0033. **Rwanda:** 3.22, p = 0.0141. **Senegal:** 8.72, p = 0.1461. **Tanzania:** 26.69, p = 0.0000. **Zambia:** 18.43, p = 0.0000.

Table 1

Percentage of men surveyed who reported having had multiple sex partners in the 12 months prior to the survey, by country and survey year

| Country/survey	Percent	(N)	SE
Ethiopia (2005)	1.0	(5,300)	0.2
Niger (2006)	2.0	(2,786)	0.3
Rwanda (2005)	2.4	(4,372)	0.3
Malawi (2004)	6.3	(2,903)	0.6
Senegal (2005)	7.7	(3,137)	0.8
Ghana (2003)	8.6	(4,214)	0.5
Kenya (2003)	10.4	(3,193)	0.6
Burkina Faso (2003)	10.8	(2,823)	0.9
Mali (2001)	11.5	(2,595)	0.8
Tanzania (2003)	18.9	(5,359)	0.7
Zambia (2001–02)	18.9	(1,878)	1.0
Guinea (2005)	20.2	(2,267)	1.1
Lesotho (2004)	21.1	(2,446)	1.1
Côte d'Ivoire (2005)	21.9	(4,256)	1.2
Cameroon (2004)	27.8	(4,576)	0.8

Table 2

Age-adjusted odds ratios (AORs) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to marital status (reference category = never married)

Country	Omnibus p-value	Monogamously married	Unmarried cohabiting	Formerly married [a]
Burkina Faso	0.0000	0.45[*]	1.09	1.79
Cameroon	0.0031	1.05	[b]	1.54[*]
Côte d'Ivoire	0.0000	0.60[*]	1.47[*]	1.22
Ethiopia	0.8910	0.71	1.27	0.76
Ghana	0.0202	0.85	1.59	1.28
Guinea	0.0011	0.51[*]	1.38	0.48
Kenya	0.0000	0.94	1.44	3.58[*]
Lesotho	0.0782	0.78	3.66	0.92
Malawi	0.5536	0.93	0.98	1.60
Mali	0.0002	0.36[*]	1.18	0.80
Niger	0.0009	0.24[*]	[b]	0.83
Rwanda	0.0000	0.98	4.12[*]	3.09
Senegal	0.0000	0.85	4.04[*]	1.47
Tanzania	0.0000	1.35[*c]	[b]	2.73[*]
Zambia	0.0394	1.03	2.48	2.00[*]

[*] Significant at p ≤ 0.05.

[a] "Formerly married" category includes those who are divorced, separated, or widowed.

[b] Unmarried cohabiting men are grouped with married men in Cameroon, Niger, and Tanzania.

[c] All of the other statistically significant AORs in this table are consistent with the "exposure to social controls" hypothesis; this is the only statistically significant AOR consistent with the "authority over wives" hypothesis.

Table 3

Age-adjusted odds ratios (AORs) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to DHS wealth-index quintile (reference category = poorest)

Country	Omnibus p-value	DHS wealth-index quintile			
		Poorer	Middle	Richer	Richest
Burkina Faso	0.0000	1.46	1.25	1.14	4.04[*]
Cameroon	0.0000	1.69[*]	2.23[*]	2.20[*]	3.11[*]
Côte d'Ivoire	0.0003	1.29	1.49	1.94[*]	2.73[*]
Ethiopia	0.7798	1.70	1.07	1.04	1.05
Ghana	0.0002	1.04	1.80[*]	1.83[*]	2.24[*]
Guinea	0.0962	1.31	1.45	1.82[*]	1.44
Kenya	0.0136	1.25	0.87	1.31	1.73[*]
Lesotho	0.3157	0.92	0.97	0.93	1.28
Malawi	0.7353	1.08	1.36	1.26	0.97
Niger	0.0048	1.62	2.49	2.48	7.51[*]
Rwanda	0.0226	3.77[*]	2.79[*]	2.18	2.08
Senegal	0.0043	0.75	1.15	0.94	2.04[*]
Tanzania	0.0403	0.87	0.76[*][a]	0.78	0.67[*][a]

Note: Wealth-index data were not available for Mali or Zambia.

[*] Significant at p ≤ 0.05.

[a] Of the statistically significant AORs in this table, these are the only ones that are contrary to the "control of economic resources" hypothesis.

Table 4

Age-adjusted odds ratios (AORs) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to respondents' educational level attained (reference category = none)

Country	Omnibus p-value	Education			
		Primary incomplete	Primary complete	Secondary incomplete	Secondary complete
Burkina Faso	0.0000	1.90[*]	2.52[*]	2.69[*]	4.28[*]
Cameroon	0.0000	2.47[*]	3.48[*]	4.58[*]	4.63[*]
Côte d'Ivoire	0.0000	2.49[*]	0.74	3.13[*]	6.13[*]
Ethiopia	0.3590	0.70	0.80	1.05	1.79
Ghana	0.0020	1.72	1.75	2.20[*]	2.64[*]
Guinea	0.6363	1.07	1.32	1.26	1.18
Kenya	0.0544	1.44	1.11	0.72	1.15
Lesotho	0.1907	1.22	1.33	1.14	1.72[*]
Malawi	0.2516	1.56	0.94	1.23	2.21
Mali	0.0000	1.43	1.51	1.78[*]	5.87[*]
Niger	0.0050	2.42[*]	2.65	1.92	5.34[*]
Rwanda	0.2789	1.68	1.44	0.77	1.45
Senegal	0.0044	1.22	2.27	2.61[*]	2.33[*]
Tanzania	0.0322	0.87	0.87	0.56[*a]	0.67
Zambia	0.8891	1.26	1.19	1.23	1.06

[*] Significant at p ≤ 0.05.

[a] Of the statistically significant AORs in this table, this is the only one contrary to the "control of economic resources" hypothesis.

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Table 5

Age-adjusted odds ratios (AORs) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to urban (versus rural) residence and household position (reference category = head of a 3+ person household)

Country	Omnibus p-value	Urban residence	Omnibus p-value	Position in household		
				Living alone	Heads 2-person household	Son or grandson
Burkina Faso	0.0000	3.35*	0.0066	2.65*	1.36	1.30
Cameroon	0.0000	1.58*	0.0000	1.95*	1.77*	1.66*a
Côte d'Ivoire	0.1778	1.24	0.1100	0.72	0.66	1.17
Ethiopia	0.4266	1.28	0.1036	3.97*	2.19	2.22
Ghana	0.0004	1.62*	0.0054	1.79*	0.93	1.09
Guinea	0.7118	1.05	0.1055	2.36*	1.05	1.31
Kenya	0.0014	1.59*	0.0000	2.87*	1.38	1.18
Lesotho	0.0007	1.75*	0.0555	2.39*	1.13	1.16
Malawi	0.3540	0.78	0.8793	1.28	1.34	1.25
Mali	0.0000	2.22*	0.0342	1.97*	1.84	2.25*a
Niger	0.0004	4.28*	0.0221	3.93*	1.73	2.33*a
Rwanda	0.8679	1.05	0.5742	0.53	1.24	0.53
Senegal	0.0110	1.67*	0.3845	1.45	0.15	1.12
Tanzania	0.2473	0.89	0.0000	2.03*	1.65*b	1.30*a
Zambia	0.1055	1.26	0.0112	2.96*	1.30	0.90

*Significant at p ≤ 0.05.

[a] Of the statistically significant AORs in this table, these are the only ones contrary to the "exposure to social controls" hypothesis.

[b] Of the statistically significant AORs in this table, this is the only one unrelated to the "exposure to social controls" hypothesis.

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Table 6

Age-adjusted odds ratios (AORs) for men who reported having had multiple sex partners in the 12 months prior to the survey, by country, according to their travel pattern (reference category = no trips)

Country	Omnibus p-value	1–5 trips, all short	1–5 trips, some long	6+ trips, all short	6+ trips, some long
Burkina Faso	0.0001	1.24	1.92*	2.86*	3.94*
Côte d'Ivoire	0.0000	2.28*	1.99*	3.99*	3.03*
Ethiopia	0.0008	1.37	2.25	5.56*	8.11*
Ghana	0.0000	2.06*	2.29*	3.09*	2.42*
Guinea	0.0000	1.88*	1.89*	2.98*	3.70*
Kenya	0.0000	1.58*	2.09*	2.25*	4.03*
Lesotho	0.0000	1.60*	1.96*	2.33*	1.99*
Malawi	0.0000	2.06*	0.85	3.32*	2.44*
Niger	0.4005	0.63	3.94*	2.00	1.10
Rwanda	0.0000	2.39*	2.01*	0.32	0.88
Zambia	0.0817	1.01	1.50*	1.59	0.72

Note: Travel-pattern data were not available for Cameroon, Mali, Senegal, and Tanzania.

*
Significant at p ≤ 0.05.