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## ARTICLES

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### **Women's Autonomy and Timing of Most Recent Sexual Intercourse in Sub-Saharan Africa: A Multi-Country Analysis**

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*Since the 1994 Cairo International Conference on Population and Development, there has been increasing interest in promoting women's empowerment, particularly for sexual and reproductive health. Women's ability to negotiate the timing of intercourse with an intimate partner has not been extensively studied. This study explored the relationships between married women's autonomy and the time since most recent sexual intercourse in Ghana, Malawi, Mali, Rwanda, Uganda, and Zimbabwe using the Demographic and Health Surveys. Significant variation both within and between countries in the timing of most recent sex was found. A strong relationship between women's decision-making autonomy and time since last sexual intercourse in all six settings, even after controlling for factors such as the husband living elsewhere, age, marital duration, and other sociodemographic variables, was found. Men's decision-making autonomy was not associated with the time since last intercourse. Understanding how women's position in the household influences their sexual activity may be an essential piece in protecting the sexual rights of women and helping them to achieve a sexual life that is both safe and pleasurable.*

Since the International Conference on Population and Development in Cairo in 1994, there has been increasing interest in promoting women's empowerment and gender equality, particularly for sexual and reproductive health (United Nations, 1994). On the 15th anniversary of the Cairo conference, the issues of women's empowerment, universal access to family planning, and sexual health continue to be salient in many developing nations. The research base for the impact of women's empowerment programs on health-related outcomes continues to be mixed. At the same time, evidence concerning women's decision-making ability about the timing and frequency of sexual intercourse remains relatively unexplored.

#### **Women's Empowerment and Sexual and Reproductive Health**

Some studies have shown that women's autonomy may change throughout the life course (Gipson &

Hindin, 2007; Hindin, 2000a) and that women's autonomy levels can vary substantially by setting (Hindin, 2006). Evidence on the importance of women's empowerment for improving sexual and reproductive health outcomes continues to be mixed. Some studies have found women's autonomy associated with improved outcomes such as child health (Fantahun, Berhane, Wall, Byass, & Hogberg, 2007), contraceptive use (Woldemicael, 2009), and longer birth spacing (Upadhyay & Hindin, 2005). Other studies have pointed to problems associated with autonomous decision making on the part of women, such as increased acceptability and reporting of domestic violence (Hindin, 2000b; Hindin & Adair, 2002) and men not attending antenatal care visits with their wives (Mullany, Hindin, & Becker, 2005).

#### **The Importance of Sexual Frequency: A Sociodemographic Perspective**

Coital frequency is related to the timing and spacing of births; however, many demographers considered coital frequency to be relatively unimportant in predicting

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fertility. For example, demographers Kingsley Davis and Judith Blake (1956) developed an analytical framework to explore the social factors related to fertility over ½ century ago. Coital frequency was relegated to an intermediate variable that was not considered important in explaining differences in fertility levels between societies. In part, coital frequency was considered unimportant due to poor quality of available data (Davis & Blake, 1956).

Evidence that coital frequency is important for fertility transitions has emerged, primarily for countries in Asia. This evidence stems from research on the shift to romantic marriages from arranged marriages. For example, coital frequency has been shown to increase when marriages are between people who are more “familiar” or “intimate” or those in which women are more comfortable with their partners. This change in frequency led to earlier first births in marriage (Fricke & Teachman, 1993; Hong, 2006).

### **Factors Associated with Sexual Frequency**

A number of studies have considered factors related to sexual frequency. A recent review considered women’s reports on sexual frequency throughout the world by reviewing existing studies and summarizing key results (Schneidewind-Skibbe, Hayes, Koochaki, Meyer, & Dennerstein, 2008). In general, it was found that older age, having at least one child, being in a relationship of longer duration, being currently pregnant, lower fertility intentions, and lower contraceptive use were the key sociodemographic factors related to less frequent sexual activity. In a study of Hong Kong Chinese couples, Cheung et al. (2008) found that interest in sex was the strongest predictor of coital frequency, and that standard demographic factors were not consistently related to frequency. In addition, the authors found a lower than expected correlation between sexual satisfaction and sexual frequency.

There have been several studies that considered frequency of sex in sub-Saharan Africa. Westoff (2007) examined multiple rounds of the Demographic and Health Surveys, which were conducted approximately five years apart, between the years of 1995 and 2005. He found that, over time, the percentage of women who reported sexual activity in the past four weeks declined in Eastern and Southern Africa, but remained constant in West Africa. He posited that the HIV epidemic and its spread was a potential explanatory factor for lower sexual frequency in Eastern and Southern Africa (Westoff, 2007). Brown (2000) found that there was substantial variation in sexual frequency in sub-Saharan Africa, with West Africa having lower rates than Eastern and Southern Africa. Although postpartum abstinence explained some of the lower rates in West Africa, this practice was not a full explanation for the observed variation (Brown, 2000).

Another set of factors that could be related to sexual frequency are sexual satisfaction or sexual pleasure. Throughout sub-Saharan Africa, limited attention has been paid to the nature of conjugal relationships, although recent evidence suggested the importance of gender norms and couple communication within relationships (Dodoo & Frost, 2008; Miller et al., 2009). Sexual pleasure for women has received limited attention in public health, even among researchers focusing on sexual and reproductive health (Dixon-Mueller, 1993; Higgins & Hirsch, 2007; Philpott, Knerr, & Maher, 2006).

Until the recent advent of microbicide feasibility studies for the prevention of HIV, women’s sexual pleasure in Africa had been relatively unexplored (for a notable exception, see Spronk, 2005). Although the intent of these studies was often to simply determine whether microbicides would be acceptable to women and their partners, in the process of assessing acceptability, the research revealed the importance of relationship quality, communication, and intimacy. For example, in Zimbabwe and Malawi, Woodson and Alleman (2008) found that women generally reported that men’s pleasure during sex was more important than their own pleasure. For some women in this study, sexual pleasure was the absence of pain. Many women experienced pain with intercourse due to norms around “dry sex,” which is a sexual practice in which women use herbs or other methods to inhibit or remove vaginal lubrication. A recent study by Hilber et al. (2010) found that women engage in vaginal practices, including drying, which they believe will improve hygiene, improve genital health, and increase sexual pleasure (primarily for men). To our knowledge, there has been no research conducted in sub-Saharan Africa that investigates the intersection of women’s autonomy and sexual pleasure, practices, or timing.

This study had two goals. First, we explored whether there was variation in the timing of most recent sexual intercourse reported by women in six geographically representative nations in sub-Saharan Africa. We considered variation within each nation, as well as variation between nations. Second, we examined potential factors related to time to most recent sex. In particular, we were interested in whether women’s autonomy was related to time to most recent sex. We used women’s autonomy in household decision making as a proxy for women’s empowerment in their relationships, despite recognition that household decision making is just one aspect of women’s empowerment (Beegle, Frankenberg, & Thomas, 2001; Lee-Rife, 2010; Mumtaz & Salway, 2009).

### **Method**

For our analysis, we used the most recent data available from the Demographic and Health Surveys in

Ghana (2008), Malawi (2004–2005), Mali (2006), Rwanda (2005), Uganda (2006), and Zimbabwe (2005–2006). The countries were chosen to geographically represent the regions in sub-Saharan Africa. We excluded all women who reported being single, divorced, widowed, or in a polygamous union from the analysis. In addition, women who were pregnant or women who identified themselves as visitors in the household in which they were surveyed were dropped from the analyses. These restrictions, along with missing data on key covariates, resulted in a final analytic sample of 1,944 of 4,916 surveyed women in Ghana; 5,556 out of 11,698 women in Malawi; 5,308 out of 14,583 women in Mali; 3,927 out of 11,321 women in Rwanda; 2,812 out of 8,531 in Uganda; and 3,594 out of 8,907 women in Zimbabwe.

### Measures

*Outcome variable: Time since most recent sex.* To measure time since most recent sex, we used the question from the Demographic and Health Surveys that asked respondents to indicate the day, week, month, and year that they last had sexual intercourse. Sexual activity was assessed as a continuous variable of time (by day) since most recent sex. We also estimated the frequency of sex using the median timing of most recent sex at the population level. Other studies (e.g., Blanc & Rutenberg, 1991) have suggested that it is possible to estimate the median frequency of sexual intercourse based on reports of the timing of last intercourse. Median sexual frequency was calculated to be twice the time to last sex. Therefore, for example, if women in a country reported a median time since last sex as one week, the median time between episodes of sex was twice as long or two weeks in that country.

*Key independent variables: Household decision making.* In the surveys, respondents were asked to indicate the person in the household that typically has the final say on the following decisions: respondent's health care, large household purchases, household purchases for daily needs, and the respondent visiting family and friends. For example, in Ghana, the exact question regarding decision making for respondent's health care that was used in the survey was, "Who usually makes decisions about health care for yourself: you, your husband/partner, you and your husband/partner jointly, or someone else?" Similar phrasing was used for the other questions on decision making in Ghana. Identical or near-identical questions were asked in each of the other five countries. For some countries, respondents were asked about additional decisions; however, to maintain congruency, we only included the decisions that were asked in every country. Women who reported that someone other than themselves, their partner, or themselves and their partner jointly had the final say on any decision were dropped

from the analysis. With the four questions on decision making, we created three summative scales measuring the number of decisions in which the woman only, partner only, and woman and partner jointly had the final say. Thus, each respondent had three decision-making scores, ranging from zero to four.

*Other covariates.* Studies have shown that a number of sociodemographic and relationship factors are related to the timing of sexual intercourse including age, parity, and duration of relationship (Schneidewind-Skibbe et al., 2008; Stewart, Morrison, & White, 2002). The covariates that were controlled for in the multivariate analysis included urban or rural residence, respondent's education, partner's education, respondent's age, difference in age between partner and respondent, wealth, parity, husband's residence, and marital duration.

The difference in age between the respondent's partner and the respondent was calculated and dichotomized into similar age (partner <3 years older than respondent) and older (partner  $\geq$ 3 years older than respondent). Wealth was a composite measure of the assets, building material, water availability, and sanitation facilities of the household. Individuals were ranked and divided into wealth quintiles based on their household's score from the composite measures. Partner's residence was assessed as a dichotomous variable of whether the partner lives with the respondent or lives elsewhere. Marital duration was coded as a categorical variable in five-year increments. For parity, we created a dichotomous variable comparing women with no births to all others since it is normative for couples to have at least one child in all of these settings (women with one or more children were coded as "0," and women with no children were coded as "1").

### Statistical Analysis

The analysis was conducted using STATA 10 (StataCorp, College Station, TX). All analyses were conducted with sampling weights using the *svy* command in STATA. The analysis was conducted in four parts. First, we described the data, including the mean values and percentage distributions for the outcome variables and the covariates. Second, we described the distribution of the timing of most recent sexual intercourse overall, frequency of sex, and the distribution of these data by women's decision-making patterns. Next, we conducted unadjusted and adjusted hazard analyses with time since most recent sex as the outcome, and with women's autonomous household decision making as the main independent variable. We utilized a block modeling strategy to assess how the different groups of common variables attenuated the association between decision making and most recent sex. However,

since the attenuation was not meaningful with the addition of each block, we presented only the unadjusted coefficients, as well as the full model.

Finally, we conducted multiple sensitivity analyses to assess the robustness of our findings. For example, to examine the possible differences between observed associations of time since most recent sex and autonomy, we examined women who co-reside and do not co-reside with their spouses. If husbands did not co-reside with their wives, it is likely that the most recent sex will have been longer ago, particularly if the men live in a different community from their wives. We also conducted sensitivity analyses by age group, as other studies have found older women may have sexual intercourse less frequently and may also be more empowered. We wanted to assess whether the relationship between autonomy

and time since last sex was consistent across the age range in our data. In addition, we assessed whether excluding women with the following conditions changed our findings: women in polygamous unions, women reporting postpartum abstinence, and women who had their most recent sexual intercourse more than 2 *SDs* from the mean of that country.

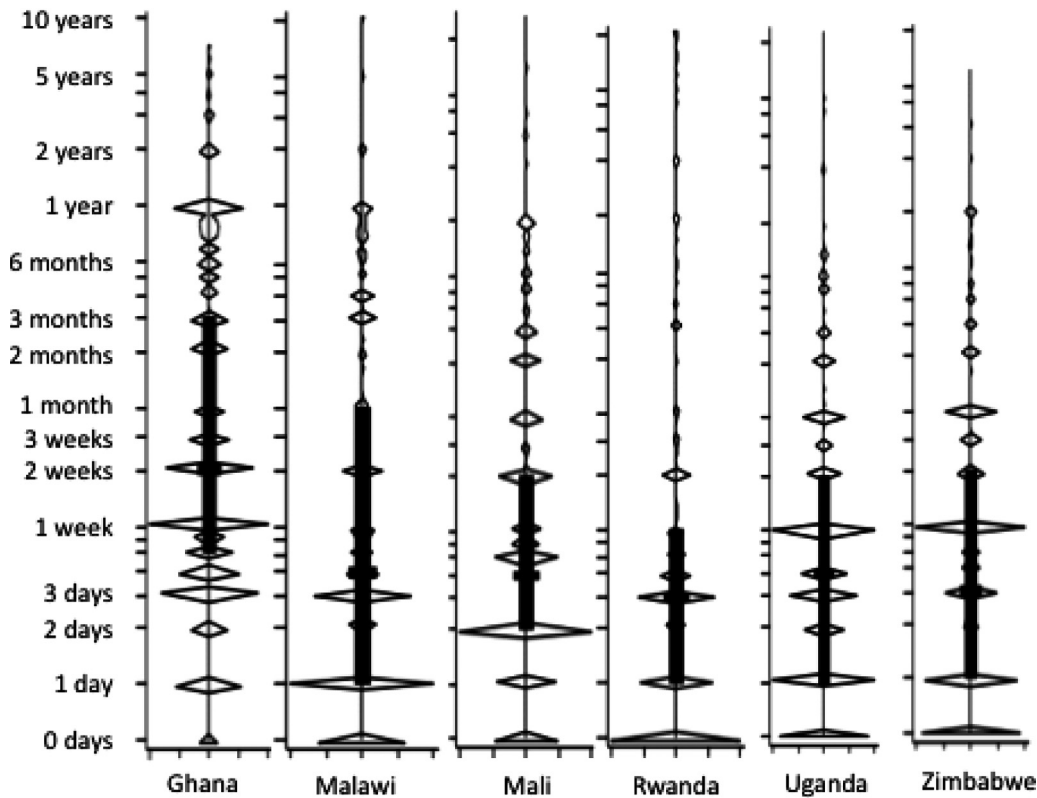
## Results

Table 1 shows the mean values and the percentage distributions of women by selected variables in each of the six countries. The majority of women, ranging from 61% in Ghana to 88% of women in Rwanda, reported sexual intercourse in the last month. Patterns

**Table 1.** Mean Values and Percentage Distributions of Married Women<sup>a</sup> across Six Countries by Selected Variables: Demographic and Health Surveys

Variable	Ghana	Malawi	Mali	Rwanda	Uganda	Zimbabwe
Sexual intercourse in past 4 weeks (%)	61.0	75.0	79.9	87.5	81.0	80.4
Decision-making scores						
Woman-only decision making						
Score 0–4	1.09	0.59	0.67	0.99	0.80	0.81
Husband-only decision making						
Score 0–4	1.00	2.59	2.93	1.35	1.52	0.40
Joint decision making						
Score 0–4	1.92	0.82	0.4	1.66	1.68	2.79
Residence (% urban)	45.8	18.7	36.3	14.1	14.0	37.3
Age of respondent	32.9	29.4	29.8	32.8	30.6	30.3
Husband's age	39.5	35.1	40.5	38.0	36.3	36.8
Age difference (%)						
Husband <3 years older	23.0	20.9	4.6	38.4	28.1	19.6
Husband ≥3 years older	77.0	79.1	95.4	61.6	71.9	80.4
Education of respondent (%)						
No education	25.9	25.1	80.2	28.6	23.6	4.8
Incomplete primary	17.1	52.8	10.0	50.7	49.0	30.1
Complete primary	5.3	9.8	1.6	11.1	10.9	6.0
Incomplete secondary	40.5	7.4	7.1	7.1	12.4	54.7
Complete secondary	7.4	4.2	0.5	1.9	0.4	0.7
Higher	3.9	0.6	0.7	0.6	3.8	3.8
Husband's education (%)						
No education	18.6	13.7	75.9	26.4	8.1	2.9
Incomplete primary	5.6	44.5	8.6	46.0	49.5	25.3
Complete primary	2.3	16.0	1.8	15.4	13.3	3.1
Incomplete secondary	46.0	11.0	9.5	8.3	19.0	58.7
Complete secondary	16.5	13.1	1.4	2.4	1.6	3.1
Higher	11.0	1.7	2.8	1.6	8.6	7.0
Wealth (%)						
Poorest	16.2	13.7	17.1	20.1	20.0	18.4
Poorer	19.0	20.7	18.0	20.6	21.2	18.5
Middle	17.4	22.1	20.0	20.0	21.0	16.9
Richer	23.0	21.4	19.1	20.4	17.6	24.5
Richest	24.4	22.1	25.7	19.0	20.2	21.7
Living children	3.0	3.1	3.3	3.6	4.0	2.8
Nulliparous (%)	7.0	6.1	8.7	4.0	3.9	5.8
Husband lives in house with respondent (%)	75.9	92.9	90.5	91.2	91.9	75.6
Marital duration (mean years)	3.2	2.9	3.2	3.0	3.2	2.9
Respondent is employed (%)	89.2	58.5	57.4	72.7	86.7	38.7
Number of respondents	1,944	5,556	5,308	3,927	2,812	3,594

<sup>a</sup>Inclusion criteria: married or cohabitating, monogamous unions, household resident at the time of the survey, and not pregnant.



**Figure 1.** Distribution of most recent sexual activity in each of the six African countries studied. *Note.* Solid bars indicate the 25th, 50th, and 75th percentiles. Areas of the diamonds indicate the proportion of the sample reporting each time from most recent sexual activity. The *y* axis is on a logarithmic scale to accommodate the wide range of responses.

of decision-making power varied by country, with husbands having the final say on more decisions in Malawi and Mali than in other countries. Ghanaian and Rwandan women reported having the final say in more decisions than women in the other countries, whereas Zimbabwean women reported the most joint decision making.

Figure 1 shows the full distribution of the timing of most recent sex in the six countries. It was particularly noteworthy that, although we see some similar median times across countries, there was a significant amount of variation within a given country in the timing of most recent sex. In Ghana, which seems to have the most aberrant pattern, there were few women who reported sex in the last two days (as evidenced by the small size of the base and one-day markers, and there is rounding by participants to one week and two weeks). In Ghana, a substantial number of women reported their most recent sex as occurring one year before the survey date. In Malawi, Rwanda, Uganda, and Zimbabwe, we found a substantial proportion of women who reported sex in the last day before the survey; but in Uganda and Zimbabwe, there were a substantial proportion of women who reported last sex as one week before the survey.

Table 2 shows that the median time since most recent sex varied from three days in Rwanda and Zimbabwe to 14 days in Ghana. Intercourse occurred once every six

days in Rwanda and Zimbabwe; once every eight days in Malawi, Mali, and Uganda; and once every 28 days in Ghana. Interestingly, other multi-country studies using the earlier rounds of the Demographic and Health Surveys found that, compared with other countries in Africa, Ghanaians reported a lower sexual frequency (Blanc & Rutenberg, 1991).

Table 2 also shows the mean and median times since most recent sex by the number of household decisions in which the woman had the final say. In addition, the percentage of women reporting zero to four decisions is displayed. The majority of women in every country, except Ghana, did not have a final say on a single household decision. The only country in which over 10% of women had the final say on all four household decisions was Rwanda. A very consistent pattern was observed across all six countries—as the number of decisions in which a woman had the final say increased, the mean and median time since most recent sex also increased by three- to 100-fold. To further examine this relationship, we used time-to-event or survival analysis to examine whether household decision making was related to women's reports of the timing of last sexual intercourse.

Based on the unadjusted models and adjusted models of factors associated with the timing of most recent sexual intercourse (Tables 3 and 4), the more decisions a woman reported making on her own, as compared

**Table 2.** Mean and Median Times Since Most Recent Sex by Country and the Number of Decisions in Which Women Report Having the Final Say: Demographic and Health Surveys

Country	Time Since Most Recent Sex: <i>M, Mdn (5th percentile, 95th percentile)</i>	Time Since Most Recent Sex by No. of Household Decisions Made by Women (% of Women): <i>M, Mdn (5th percentile, 95th percentile)</i>
Ghana	108.9, 14 (1, 365) days	0 decisions (42.8%): 84.6, 14 (1, 365) days 1 decision (25.8%): 94.8, 14 (1, 365) days 2 decisions (18.7%): 119.2, 14 (1, 730) days 3 decisions (7.0%): 168.8, 30 (1, 730) days 4 decisions (5.7%): 247.2, 35 (4, 1,460) days
Malawi	54.4, 4 (0, 305) days	0 decisions (65.5%): 44.7, 4 (0, 244) days 1 decision (21.4%): 51.2, 4 (0, 274) days 2 decisions (7.2%): 81.1, 3 (0, 274) days 3 decisions (2.7%): 112.7, 7 (0, 365) days 4 decisions (3.1%): 165.3, 30 (0, 730) days
Mali	45.1, 4 (0, 213) days	0 decisions (67.5%): 35.6, 4 (0, 183) days 1 decision (17.4%): 36.6, 3 (0, 183) days 2 decisions (6.7%): 39.3, 5 (0, 244) days 3 decisions (2.8%): 57.1, 5.5 (0, 365) days 4 decisions (5.6%): 186.4, 14 (1, 1,095) days
Rwanda	79.5, 3 (0, 183) days	0 decisions (53.6%): 12.2, 2 (0, 30) days 1 decision (19.0%): 9.1, 2 (0, 30) days 2 decisions (11.2%): 9.8, 2 (0, 30) days 3 decisions (4.4%): 49.0, 3 (0, 61) days 4 decisions (11.9%): 570.6, 30 (0, 3,285) days
Uganda	39.3, 4 (0, 213) days	0 decisions (52.7%): 26.4, 3 (0, 152) days 1 decision (25.1%): 37.6, 4 (0, 213) days 2 decisions (12.4%): 42.9, 4 (0, 274) days 3 decisions (5.5%): 48.6, 7 (0, 305) days 4 decisions (4.1%): 193.0, 30 (1, 730) days
Zimbabwe	30.1, 3 (0, 152) days	0 decisions (55.3%): 24.0, 3 (0, 91) days 1 decision (20.7%): 25.2, 3 (0, 122) days 2 decisions (13.5%): 32.5, 3 (0, 213) days 3 decisions (5.5%): 59.4, 7 (0, 274) days 4 decisions (5.0%): 78.8, 21 (1, 365) days

**Table 3.** Unadjusted Hazard Ratios of Time Since Most Recent Sex, in Days

Variable	Ghana	Malawi	Mali	Rwanda	Uganda	Zimbabwe
Decision-making scores (reference = joint)						
Woman-only decision making						
Score 0–4	0.88***	0.89***	0.90***	0.77***	0.88***	0.89***
Husband-only decision making						
Score 0–4	1.03	1.03**	1.06***	1.10***	1.04*	0.98
Partner's residence (reference = partner lives in house with respondent)	0.60***	0.50***	0.35***	0.23***	0.60***	0.45***
Marital duration	1.01	1.01	1.00	0.90***	0.96***	0.99
Parity (reference = 1 or more children)	1.69***	1.47***	1.07	1.58***	1.40***	0.99
Residence (reference = urban)	1.03	0.82*	0.97	1.02	0.96	0.76***
Age of respondent	1.00	1.00	1.00	0.98***	0.99***	1.00
Age difference (reference = less than 3 years older)	0.98	0.99	0.99	0.93*	1.00	0.92†
Education of respondent	1.07***	1.03	1.02	1.04*	1.07***	1.09***
Education of partner	1.04**	1.01	1.02	1.02	1.03*	1.06***
Wealth (reference = poorest)						
Poorer	1.25**	1.07	1.04	1.19**	1.26***	1.18**
Middle	1.18*	1.01	0.99	1.24***	1.40***	1.13*
Richer	1.22**	0.98	1.00	1.30***	1.36***	1.43***
Richest	1.48***	1.05	1.05	1.23**	1.48***	1.46***
Respondent is employed	1.03	0.93*	0.89***	0.97	0.98	1.24***
Number of respondents	1,944	5,556	5,308	3,927	2,812	3,594

\* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . † $p \leq .10$ .

**Table 4.** *Adjusted Hazard Ratios of Time Since Most Recent Sex, in Days*

Variable	Ghana	Malawi	Mali	Rwanda	Uganda	Zimbabwe
Decision-making scores (reference = joint)						
Woman-only decision making						
Score 0–4	0.90***	0.92***	0.94*	0.90***	0.91***	0.91***
Husband-only decision making						
Score 0–4	1.02	0.98	0.98	0.97*	0.99	0.95*
Partner's residence (reference = partner lives in house with respondent)	0.57***	0.53***	0.33***	0.28***	0.62***	0.43***
Marital duration	1.04	1.03	1.02	1.02	0.98	1.02
Parity (reference = 1 or more children)	1.85***	1.56***	1.34***	1.30 <sup>†</sup>	1.40***	1.18*
Residence (reference = urban)	1.30***	0.87 <sup>†</sup>	0.92 <sup>†</sup>	1.13*	1.14	0.97
Age of respondent	1.00	1.00	0.99 <sup>†</sup>	0.98***	0.99	0.99
Age difference (reference = less than 3 years older)	0.94	0.99	0.90	0.87***	0.98	0.88**
Education of respondent	1.06**	1.02	1.03	1.04*	1.02	1.06**
Education of partner	1.02	1.00	1.01	1.02	1.00	1.05*
Wealth (reference = poorest)						
Poorer	1.29**	0.97	1.10 <sup>†</sup>	1.11*	1.24***	1.14*
Middle	1.42***	0.97	1.02	1.12*	1.43***	1.14*
Richer	1.50***	1.04	0.99	1.20***	1.42***	1.13 <sup>†</sup>
Richest	1.75***	1.00	1.01	1.23***	1.55***	1.06
Respondent is employed	1.07	0.95	0.90**	1.01	1.12 <sup>†</sup>	1.21***
Number of respondents	1,944	5,556	5,308	3,927	2,812	3,594

\* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . <sup>†</sup> $p \leq .10$ .

to joint decision making, the less likely she was to have sex (relative hazard  $< 1$ ) and the longer it was since she last had sexual intercourse. In contrast, in all countries except Zimbabwe and Ghana, there was a statistically significant, positive relationship between husband's decision making and more recent sexual intercourse, as compared to joint decision making. In the adjusted model, all of the observed relationships between women's decision making and recent sexual activity hold. The adjusted relationship between husband's decision making and the timing of most recent sexual intercourse was no longer significant, except in Zimbabwe and Rwanda in which a weak, negative association was observed ( $p < .10$ ; see Table 4).

Several of the covariates were also found to have statistically significant associations with the timing of most recent sexual activity. The association between husband's residence and recent sexual activity was very strong, with less frequent sex being reported by respondents whose husbands lived elsewhere, compared to women whose husbands resided in the same house. This association remained strong even after adjusting for all other covariates. In the unadjusted analysis, a statistically significant, negative association between marital duration and recent sexual activity was observed in Rwanda and Uganda only. After adjustment for other covariates, the association between marital duration and recent sexual activity was not statistically significant in any country; however, the hazard ratios for every country were positive, except in Uganda.

No consistent pattern was found between the other sociodemographic variables and recent sexual activity across countries. For example, in the unadjusted models (see Table 3), wealth was associated with recent sexual

intercourse in Ghana, Rwanda, Uganda, and Zimbabwe. No association between wealth and recent sexual activity was observed in Malawi or Mali. After controlling for other covariates, the strong association remained in Ghana, Rwanda, and Uganda. For other variables, such as residence (urban vs. rural) and respondent's employment status, the association with recent sexual activity was not in the same direction across all six countries.

We conducted several sensitivity analyses to examine the robustness of our findings. We explored the relationship between age and the timing of most recent sex using stratified models. These models showed slight attenuation of the association between women's decision-making autonomy and the timing of most recent sex, but all associations remained in the same direction. Similarly, stratifying by husband's residence had little impact on the reported associations between women's decision making and the timing of most recent sex. We reanalyzed our data, removing women whose most recent sex was greater than 2 *SDs* from the mean, as well as women who reported postpartum abstinence, and these changes had no substantive impact on the results (data not shown). We also reexamined our results to include women who were excluded due to being part of a polygamous union, and the inclusion of these women did not change the observed association between women's decision-making autonomy and time since most recent sex (data not shown).

## Discussion

In each of the six countries studied, the timing of most recent sexual intercourse varied considerably

across women and between nations. As may have been expected from prior studies (Brown, 2000), overall we found that Ghana had the lowest percentage of women to report sexual intercourse in the past month (61%). However, we did not find consistently lower rates in West Africa compared with Eastern and Southern Africa, as Mali's rates were similar to Uganda and Zimbabwe. In addition to significant variation between nations, we found variation within countries (see Figure 1).

Time since last sexual intercourse was strongly related to women's autonomous decision-making power. We found that women who had the final say in more decisions were less likely to report more recent sexual activity. The association was very strong, with median time to most recent sex varying from three- to 100-fold between women who reported the final say in zero decisions compared with women who made four out of four decisions. In contrast, for men, making autonomous decisions were not related to the timing of most recent sex in any of the six countries after multivariable adjustment. To our knowledge, this was one of the first studies to examine these associations.

Most standard sociodemographic variables were not consistently associated with the timing of most recent sexual intercourse. For example, older women were no more or less likely to report more recent sexual intercourse in five of the six countries. Marital duration was not related to the timing of most recent sex in any of the multivariate models. Higher parity was associated with more recent sexual intercourse in all of the countries, except Rwanda. Wealth, employment status, rural or urban residence, and partner characteristics were inconsistently or unassociated with the timing of sexual intercourse in the six countries.

There are some limitations to this study that should be taken into consideration. First, we only included six countries in the analysis; however, we purposely selected countries from different regions throughout sub-Saharan Africa to allow us to assess for similarities and differences between regions. We were also limited in our ability to assess the validity of women's self-reports on sexual activity; however, other studies have found reasonably reliable reports of sexual frequency in other African settings (Lagarde, Enel, & Pison, 1995) and using the Demographic and Health Survey data (Blanc & Rutenberg, 1991). Using cross-sectional data was another limiting factor. We are unable to fully explain the association we found between decision making and recent sexual activity and what the mechanism may be between women's greater autonomy and a longer interval between sexual intercourse. We did not have data on women's decision making around sexual intercourse, their preferences on the timing or frequency of sex, or their sexual satisfaction.

Despite these limitations, the findings from this analysis contribute to our understanding of frequency of sexual activity in sub-Saharan Africa and its relationship

to household decision making. Additional studies are needed to further explore the strong association between women's decision-making power and recent sexual activity that was found in our analyses. Qualitative work exploring relationship quality and sexual frequency could shed light on programs designed to promote contraceptive use or HIV-prevention strategies. Longitudinal studies will be especially important in determining directionality of the observed associations. Moreover, new and improved measures of women's empowerment (that take the multidimensionality of the concept into account) are needed. Although the timing of most recent sex is used as a proxy for choice around sexual intercourse, better measures of how and when women and couples choose to have sex, and whether sexual relations are satisfactory, are needed.

Sexual activity has commonly been overlooked in both demographic and family planning research, yet it is evident from our study that a strong association exists between decision making and the time since most recent sexual intercourse in the countries under study. Both demographers interested in promoting contraception and increasing understanding of patterns of child bearing and public health researchers in the burgeoning field of female sexual pleasure should find the results of this study of interest. The study provides several important areas for further inquiry. First, whether women who have the final say in decisions also have the ability to choose the timing and frequency of sex remains an important, unanswered question. Next, from a public health standpoint, exploring whether women who are in control of the timing of sexual intercourse have more pleasure and less pain during sex, have better marital relationships, or better communication should be investigated. Third, with the increased interest in women's empowerment from demographers and social scientists since the 1994 Cairo International Conference on Population and Development, the reported associations in this study provide another avenue for better understanding how women's empowerment may operate. Finally, understanding how women's position in the household influences their sexual activity may be an essential piece in protecting the sexual rights of women and helping them to achieve a sexual life that is both safe and pleasurable (Petchesky, 1997).

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