Title: Attitudinal and behavioral factors associated with extramarital sex among Nigerian men: findings from a national survey

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Abstract

Using couple data from a national survey, this paper examines factors associated with extramarital sex among Nigerian men. We found 15.4% of married men had extramarital sex in the past 12 months. Extramarital sex was significantly associated with men's attitude toward extramarital sex [Adjusted Odds Ratio (AOR)=1.7 (95%CI:1.4-3.0)], early sexual debut [AOR=1.9 (1.6-2.3)], alcohol use [AOR=1.8 (1.4-2.2)], paying sex [AOR=3.5 (2.4-5.0)], and intimate partner violence against wife (IPV) [AOR=1.4 (1.2-1.7)]. Men living in rural areas, in the central and the south were also more likely to have extramarital sex. The findings suggest that extramarital sex is facilitated by a set of sexual-risk behavior such as IPV, alcohol use, and early sexual debut that hint useful implications for HIV prevention programs in Nigeria. Interventions should focus on influencing social norms around protective behaviors for men to avoid risks associated with extramarital sex and IPV; help men to change attitudes toward extramarital sex and IPV, and promote delay in age at first sex among young men.

Key words: Extramarital sex; HIV risk; intimate partner violence; men; Nigeria

Word count: 3450 words

INTRODUCTION

It is estimated that the current HIV prevalence in the general Nigerian population is 3.6% and there are 3.3 million people living with HIV (UNAIDS, 2010; UNGASS, 2010). The HIV epidemic affects all segments of the population and is primarily transmitted through heterosexual intercourse. It is estimated that 9 out of 10 HIV infections occur via heterosexual intercourse (FMOH, 2005). Sexual risk behaviors such as multiple sexual partnerships, sex at early age, and inconsistent condom use with casual partners are key drivers for the spread of the HIV epidemic in Nigeria (FMOH, 2005; Isiugo-Abanihe, 1994; Udoh, Mantell, Sandfort, & Eighmy, 2009; UNAIDS, 2010) . A few studies at small-scale levels estimate that over 50% of married men in Nigeria have extramarital sex (Isiugo-Abanihe, 1994; Orubuloye, Caldwell, & Caldwell, 1997a). The most recent study using nationally representative data from the 2003 demographic and health survey (DHS) found 16.2% of men reporting extramarital sex in the past 12 months (Oyediran, Isiugo-Abanihe, Feyisetan, & Ishola, 2010). The pervasive attitude of male dominance, norms around male sexual performance and gender inequality, is often reported as a contributing factor for extramarital sex and the spread of HIV (Orubuloye, et al., 1997a; Smith, 2007). Predominant masculinity scripts found in rural Nigeria emphasize sexual experimentation and multiple partnerships as a feature of manhood (Izugbara, 2008; (Izugbara, 2008; Omololu, Aderinto, Adeyefa, Adeyemo, & Osotimehin, 2004)). This, combined with the socio-economic dependence of women (Isiugo-Abanile, 2003) and the intersection of economic and gender inequalities, provides an expression of men's economic and masculine status (Smith, 2007).

Studies have consistently found that sexual overlapping significantly contributes to high HIV transmission among women and men in Africa (Cockcroft, Andersson, Ho-Foster, Marokoane, & Mziyako, 2010; Lagarde et al., 2001; Mah & Halperin, 2010; Reniers & Watkins, 2010). HIV transmission depends on acquiring the infection and transmitting the virus to others, which is clearly facilitated by sexual networking and concurrencies (Rothenberg, Potterat, & Gisselquist, 2002).

Mathematical models suggest that multiple sexual partnerships intensify the rapid spread of HIV transmission (Morris & Kretzschmar, 1997). In Africa including Nigeria, women remain at higher risk of HIV infection compared to their male counterparts with 60% of HIV cases being women (UNAIDS, 2010). This reinforces the fact that the probability of transmission of HIV from men to women is higher than from women to men. In fact, in Nigeria, many married women are unable to confront their husbands over infidelity or to protect themselves from HIV infections. If a man cheats on his wife, it is often reported that the wife will be blamed (Smith, 2007). Given the above, UNAIDS has called for innovative strategies directed at men to reduce their sex partners among men in Africa thereby reducing women's risk of contracting the virus (UNAIDS, 2007, 2010).

To effectively respond to this call, it is necessary to understand the socioeconomic, behavioral and attitudinal factors associated with men's extramarital sex. In addition, the common notion that marriage provides women with more autonomy and protection against HIV infection is worthy of further examination. A number of studies on men's extramarital sexual behaviors has been conducted in Nigeria although they mainly interrogated and explored socioeconomic and behavioral correlates and were generally small-studies (Fatusi & Wang, 2009; Isiugo-Abanihe, 1994; Izugbara & Nwabuawele Modo, 2007; Mitsunaga, Powell, Heard, & Larsen, 2005; Orubuloye, et al., 1997a; Orubuloye, Caldwell, & Caldwell, 1997b; Oyediran, et al., 2010). Clearly, these studies have added value to a better understanding of sexual dynamics within the modern Nigerian marriage. However, there are gaps in understanding attitudinal factors that could also shape men's sexual risk behaviors. In addition, there are conflicts in defining sexual concurrency; polygynous men are often included within the "multiple sexual partnerships" category. It is obvious that polygamous men who do not have extramarital sex pose a different risk than monogamous men who have other ongoing sexual relationships. Therefore, the definition of sexual concurrency among married men would rather refer to "extramarital sex" than "multiple sexual partnerships". In addition, there is evidence from South Africa and Asia demonstrating that there is an increased risk of HIV infection among women

experiencing intimate partner violence (IPV) (Dunkle et al., 2004; Kalichman et al., 2007; Kalichman et al., 2005; Modie-Moroka, 2009); and IPV has been linked to greater HIV and STI infection (Adebayo, Fahrmeir, Seiler, & Heumann, 2010; Ezechi et al., 2009; Silverman, Decker, Kapur, Gupta, & Raj, 2007; Silverman, Decker, Saggurti, Balaiah, & Raj, 2008).

To date, no study has examined the relationship between IPV and extramarital sex [or sexual concurrency] in Nigeria. This study explores the attitudinal and behavioral correlates of men's extramarital sexual behaviors including IPV, attitudes toward extramarital sex, transactional sex, alcohol use, age at first sex, and age between husband and wife. .

METHODS

Data

We examined 8,731 married couples with paired (matched) data from the 2008 Nigerian Demographic and Health Survey (DHS) conducted by the National Population Commission of Nigeria and Macro International (MD, USA). The survey used a two-stage cluster design. The first stage identified 888 clusters with a probability proportional to the size. The second stage involved selection of systematic sampling of 41 households per cluster through systematic sampling. Detailed sampling techniques and study procedures can be found elsewhere (DHS, 2008).

For the purpose of this study, the analysis focused on men's extramarital sex using the matched couple data. Because women are more likely to underreport extramarital sex (Adeokun, 1989; Buve et al., 2001) and the prevalence of reported extramarital sex among women was low (2%) in the data, women's extramarital sex was not examined. As the dependent variable is "men's extramarital sex" in the past 12 months, men who did not have sex in the past 12 months (n=432) were excluded, leaving a sample of 8,299 for analysis. In addition, only a subset of men and women were surveyed on intimate partner violence (IPV) and partner's alcohol use (n=6,241). Thus we conducted two analytic approaches: 1) using only complete cases [cases without missing values] for multivariate analysis

(n=6,241), and 2) using the whole sample (n=8,239) with missing values imputed using STATA software version 11.

Variables

The dependent variable indicates whether a man had extramarital sex in the past 12 months. This is a binary variable based on self-reported number of sex partners, excluding their spouse(s), in the past 12 months. Independent variables were identified through literature review and theoretical concepts, including socio-economic characteristics [age, education, wealth, place of residence, religion], knowledge of HIV prevention, paid sex [past year], condom use at last sex, alcohol use, age at sexual debut, attitude towards having extramarital sex, polygyny, age gap between husband and wife, and IPV [physical and sexual violence against wife]. Details of how each independent variable was measured and constructed are in Table 1.

Socioeconomic and demographic factors such as age, education, wealth, religion and place of residence are believed to be associated with extramarital sex (Bingenheimer, 2010; Do & Meekers, 2009; Isiugo-Abanihe, 1994; Mitsunaga, et al., 2005; Oyediran, et al., 2010). It is believed that Christian men are more likely to engage in extramarital sex than Muslim men due to strong religious norms among Muslims against this practice (Isiugo-Abanihe, 1994; Orubuloye, et al., 1997a). Early sexual debut and polygyny are also reported to be associated with extramarital sex (Fatusi & Wang, 2009; Oyediran, et al., 2010). It is also hypothesized that knowledge of HIV prevention may reduce extramarital sex (Do & Meekers, 2009; Isiugo-Abanihe, 1994) however, having extramarital sex may increase perceived risk of HIV infection and therefore, increase condom use and HIV testing (Do & Meekers, 2009). Other factors including alcohol consumption and migration have also been found to be associated with extramarital sex (Kongnyuy & Wiysonge, 2007; Mitsunaga, et al., 2005; Oyediran, et al., 2010).

Statistical analysis

Descriptive and bivariate analyses were used to describe the characteristics of the study population and those who had extramarital sex. Multiple logistic regression analysis was used to assess effects of each independent variable on extramarital sex while controlling for other covariates. Odds ratio, adjusted odds ratio, 95% confidence interval, and levels of significance were reported. Selection of variables into the multivariate regression model was determined through literature and theoretical concepts. A stepwise forward selection technique was used to explore the model; p =0.25 is the criterion for each variable to enter the model. Log likelihood estimates were used to determine whether removing or adding a variable improves the model. Cluster size was adjusted for in all analyses (Robust Standard Error was obtained). All analyses were carried out using Stata Software Version 11.0.

Given that only a subset of women was surveyed on intimate partner violence (IPV) and husband's alcohol consumption, results may be biased and the representative patterns of the sample would be compromised if those without information on IPV were dropped from the analysis. In addition, we did a sub-analysis comparing the subsample of 6421 complete cases and a subsample of 1878 cases that contained the missing values and found that the prevalence of extramarital sex was significantly higher among those with missing values. Therefore, we offered two analysis approaches to handle the missing data. In the first approach, we used only complete cases [cases without missing values; n=6421] for the multivariate regression analysis. In the second approach, we used the whole sample [n=8299] with missing values imputed using multiple imputation (MI). MI is a simulation-based statistical technique for handling missing values. MI yields unbiased point estimates and stable confidence intervals (Rubin, 1996). In STATA, MI consists of 3 steps: 1) a complete data set is generated under a chosen imputation model, 2) analysis was performed separately on each imputation, and 3) all completed-data analyses are combined in one single imputation result. We ran different MI models with different numbers of imputations until we obtained stable results. We report below results from both approaches for comparisons.

RESULTS

Over half [52%] of the study population was in the middle age group [30-44 years old]; 16% in the young age group [15-29 yrs old], and 32% in the older age group [45-59 yrs old]. About three-quarters resided in rural area, one-half resided in the North, one-fifth in the Central [Middle-Belt], and approximately one-third in the South. Over one-third of men (38%) had no education and about one-half had secondary and primary education. Sixty percent of the study population was Muslim, 37.5% was Christian, and 2.5% reported having no religion or following a traditional religion. Ten percent of men had first sex at the age of 15 or younger, 2% paid for sex in the past year, 19% was away from home for at least a month within the past 12 months, and 12% agreed to the statement that husbands have a right to have extramarital sex. About 15% of the currently married men reported having extramarital sex in the past 12 months; only 5% reported using condom at last sex. Looking at couple characteristics, approximately 98% of men were older than their wives; only 2.1% of men had older wives. Regarding the distributions of age gap between husband and wife, 29% of men were 0-5 years, 36% of men were 5 to 10 years, 20% was 10 to 15 years, and 13% was 15+ years older than wife. Fifteen percent of women reported that their husbands drank alcohol and 16% reported that their husbands had physically or sexually abused them. Bivariate analyses suggest that most of the covariates were significantly related to extramarital sex, except knowledge of HIV, migration, and condom use at last sex (Table 2).

Results of the crude and adjusted logistic regression analyses are presented in Table 3. As expected, the direction of the relationships between dependent and independent variables are in the same direction across the crude and adjusted analysis. Adjusted regression results from the model with missing-value cases imputed and from the model with missing-value cases deleted are consistent.

Results of the adjusted multivariate model with missing values imputed show that men aged 30-44 [OR = 1.4; 95% CI= (1.1-1.7)] and men aged 45-59 [OR = 2.1 (1.7-2.6)] were more likely to

have extramarital sex compared to men aged 15-29. Married men from the Central were 2.1 times [1.7-2.5]) and the South were 1.5 times [1.2-1.8]) more likely to report extramarital sex compared to men of the Northern region. Living in rural area was also associated with higher extramarital sex [OR=1.5 (1.3-1.8)]. Household wealth, education and being away from home for more than a month were not significant correlates of extramarital sex. Attitudinal and behavioral factors showed strong effects on extramarital sex. Early sexual debut (OR=1.9 [1.6-2.3]) and paid sex in the past year [OR=3.5 (2.4-5.0)] were significantly related to extramarital sex. Men who reported that husbands have a right to have sex with another woman were 1.7 times [1.4-3.0] more likely to have extramarital sex. Men who reported drinking alcohol [OR=1.8 (1.4-2.2)] and abusing their wives in the past 12 months [OR=1.4 (1.2-1.7)] were more likely to engage in extramarital sex. Lastly, age gap between husband and wife of 15+ years was significantly associated with extramarital sex [OR=1.6 (1.3-2.0)]. Knowledge of HIV prevention and condom use at last sex were not associated with the outcome. Men in a polygynous relationship were less likely to engage in extramarital sex [OR=0.3 (0.2=0.4)].

We explored some potential interactions but no significant results were found. We also explored community-level wealth and education by averaging wealth index scores and educational levels across clusters but no significant result was found.

DISCUSSION

This study found 15.4% of men had extramarital sex among a population-based sample of married couples, which is similar to findings from the DHS 2003 (Oyediran, et al., 2010). Since only a few men used a condom at last sex (5%), men who have extramarital sex continue to put themselves and their wives at risk of HIV and STI infection. We found prevalence of extramarital sex varied significantly across different geographical regions. Men living in the South and the Central (Middle-Belt) and rural areas are more likely to report extramarital sex. The finding that rural men were more likely to engage in extramarital sex contradicts with the finding from previous research (Mitsunaga, et

al., 2005). This may be because the perception of polygamy is more common in the South and the Central as well as in rural areas, creating a favorable environment for this behavior to occur (Orubuloye, et al., 1997b). Another reason may be that traditional norms may be diminished by urbanization with men living in urban areas being more likely to drop their traditional beliefs and adapt to new cultural values.

Extramarital sex increased with the current age of respondents. Age can be considered a predisposing factor and can also be correlated with duration of marriage. The longer men live, the more likely they are to be exposed to more sexual opportunities. This is more so as men are more likely to achieve economic independence with age giving them more chances to socialize outside their home. In a qualitative study, Smith (2007) found that Nigerian men often viewed extramarital sex as an expression of masculine and economic status; they enjoy the feeling of taking care of other women and being able to provide women with material goods (Smith, 2007). The finding that men who were 15+ years older than wives were more likely to engage in extramarital sex suggests that this type of relationship between an older husband and a very younger wife may be more likely to be economically driven i.e. the "sugar daddy" relationship as described by Kuate-Defo (Kuate-Defo, 2004) and Smith (2007). It is important to note that economic and gender inequalities make it difficult for women to negotiate condom use with older and wealthier male partners (Preston-Whyte, 1999).

Male attitude towards extramarital sex was a strong predictor of having extramarital sex, independent from socioeconomic characteristics and knowledge of HIV. This indicates the important impact of social norms on sexual behavior and that extramarital sex may rather be reflective of normative expectations than socioeconomic status. Previous studies in Nigeria indicate that it is widely perceived that men and women are biologically different in their desire for sex, which may affect the actual sexual behavior of men (Orubuloye, et al., 1997b; Smith, 2007). This finding underscores the need for interventions and communication to change attitudes towards extramarital sex. We also found that early sexual debut was a significant independent correlate of multiple sexual

partnerships. This is consistent with findings from a multi-site study in Africa and Asia, an analysis of the 2003 Nigeria DHS data, and other studies (Fatusi & Wang, 2009; Kongnyuy & Wiysonge, 2007; Oyediran, et al., 2010; White, Cleland, & Carael, 2000). These findings suggest that a set of risky sexual behaviors maybe incorporated within early sexual initiators, including having multiple sex partners, or sexual debut may establish a pattern of sexual behavior that continues to affect individuals over their life course. A longitudinal study design would be better to examine this hypothesis.

We also found an association between extramarital sex among men and alcohol consumption. This relationship has been documented by other studies (Hall, Fals-Stewart, & Fincham, 2008; Kongnyuy & Wiysonge, 2007; Oyediran, et al., 2010) and therefore supports the theory that alcohol consumption influences men to engage in higher risk. We did a sub-analysis and found that those who drink alcohol were also more likely to pay for sex *[data not shown]*. Studies also have found that sex under the influence of alcohol is more likely to be unprotected (Hall, et al., 2008). This suggests the importance of condom promotion at bars or public areas where men hang out and among female sex workers.

The finding that extramarital sex was associated with IPV has important implications for prevention of HIV and IPV among women, especially given that research on this topic is limited in Nigeria. IPV against women is an immense public health concern worldwide that has serious consequences for women's physical and mental health (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006). Forced and coerced sex obviously put women at higher risk of HIV transmission; it limits women's ability to have protected sex; and it causes psychological trauma that would negatively change women's behaviors. We found that 16% of women in Nigeria had experienced IPV within the past 12 months, which is among the range of global estimates of 15%-50% (Garcia-Moreno, et al., 2006). Studies in developing countries have found that women experiencing IPV were more likely to be infected with HIV and STIs (Adebayo, et al., 2010; Ezechi, et al., 2009) and men who physically abused their female partners were also more likely to engage in higher risk sex and to be infected with

HIV and STIs (Dunkle, et al., 2004; Silverman, et al., 2007; Silverman, et al., 2008). Given a society where both extramarital sex and IPV are largely perceived as normal (Antai & Antai, 2008; Ezechi et al., 2004; Garcia-Moreno, et al., 2006; Orubuloye, Caldwell, & Caldwell, 1993; Orubuloye, et al., 1997a, 1997b; Smith, 2007), programs to change community and individual attitudes towards these two critical issues are of importance; men need to recognize their civic responsibilities to their partners' health and wellbeing. Randomized-control studies in South Africa and other developed and developing settings have also documented successful approaches in reducing alcohol consumptions, IPV and multiple sexual concurrencies which can be applied to the Nigerian context (Kalichman & Grebler, 2010; Kalichman et al., 2008; Simbayi et al., 2006; Spangaro, Zwi, Poulos, & Man, 2010).

Despite these important findings, this study needs to be interpreted with some caution. A major limitation is that we relied on self-reported number of sex partners in the past year. Social desirability bias may lead men to under-report the number of sex partners. Studies have revealed considerable inconsistencies in individual self-report of sexual behaviors (Adeokun, 1989; Buve, et al., 2001; DHS, 2008). Despite the potential under-reporting, we found a fairly high prevalence of extramarital partnerships. In addition, these findings can only indicate associations rather than causality due to the nature of cross-sectional surveys; extramarital sex and its correlates may be shared by a common set of risk factors. Notwithstanding, the analysis has the advantage of using the most recent and nationally representative data, and demonstrates that men who have extramarital sex are at high risk for HIV infection and transmission. Extramarital sex is facilitated by a set of sexual risks behaviors such as IPV, alcohol use, and early sexual debut that hints at useful implications for HIV prevention programs in Nigeria. Interventions should focus on influencing social norms around protective behaviors for men to avoid risks associated with extramarital sex and IPV; help men to change attitudes toward extramarital sex and IPV, and promote delay in age at first sex among young men.

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Table 1: Definition and measurement of independent variables

Variables	***Definition and measurement***
Age	Age of respondent in 3 categories: 15-29,30-44, and 45-59
Education	Categorical variable indicating respondent's levels of education: 1) no school, 2) primary and secondary school, and 3) higher than secondary school
Household wealth	Measured using household-asset data including electricity, radio, TV, bicycle, motorbike, car, water supply and types of house floor. The wealth index score was constructed using component principal analysis and was divided into 3 quintiles.
Religion	Respondent's religion which was categorized as Christian, Muslim and other
Place of residence	Was defined as urban or rural
Region	Geographical region where respondents residing, which was grouped as: North, Central [middle-belt] and South
Being away from home in the past year	Binary variable indicating whether respondent was away from home for at least a month in the past year
Early sexual debut	Binary variable indicating whether respondent had first sex at the age of 15 and younger
Popygyny	Binary variable indicating whether respondent was in a polygynous relationship
Knowledge of HIV prevention	Knew to reduce HIV infection by having sex with one partner
Paying sex in the past year	Whether respondent paid for sex in the past 12 months
Condom use at last sex	Whether respondents used condom the last time he had sex within the past 12 months
Attitude toward extramarital sex	Binary variable indicating whether the husband agreed or disagreed with the statement: *"Husband has right to have sex with other women"*
Husband's alcohol use	Measured by asking the woman if her husband drinks alcohol
Intimate partner violence (IPV)	Measure by asking the woman if she has been physically or sexually abused by her husband within the past 12 months. IPV includes being slapped, punched, kicked, dragged, forced to have sex, twisted, and threatened with knife or gun. The variable was dichotomized as having one or more than one IPV versus no IPV
Age gap between husband and wife	A 5-level categorical variable: Husband is 0-5 years, 6-10 years, 11-15 years, or more than 15 years older than wife, and husband is younger than wife

Notes: Variables that were explored but excluded from the tables because no relationship was found: 1) having tested for HIV, 2) having any STI within past year, 3) community-level wealth, 4) community-level education, and 5) women's levels of autonomy

Table 2: Factors associated with extramarital sex: bivariate relationship (n=8299)

	Had extramarital sex		***Total sample***
	% (N)	*χ2(sig.)*	*% (N)*
Age (years)		*61.5 ****	
15-29	11.5 (151)		15.8 (1315)
30-44	13.9 (601)		52.3 (4337)
45-59	19.7 (522)		31.9 (2647)
Education		*10.9***	
No education	14.8 (465)		38.0 (3150)
Primary and secondary	16.5 (688)		50.4 (4179)
Higher	12.5 (121)		11.7 (970)
Household wealth		*11.8***	
First quintile	13.7 (309)		27.2 (2259)
Second quintile	16.9 (583)		41.6 (3453)
Third quintile	14.8 (382)		31.2 (2587)
Region		*90.1****	
Central	22.2 (332)		18.1 (1499)
North	12.2 (533)		52.6 (4363)
South	16.8 (409)		29.4 (2437)
Residence		*20.9****	
Rural	12.4 (277)		73.0 (6060)
Urban	16.5 (997)		27.0 (2239)
Religion		*11.7****	
Muslim	14.6 (728)		60.0 (4978)
Christian	16.0 (499)		37.5 (3114)
Traditional/other	22.7 (47)		2.5 (207)
Away from home for at least a month in past year		*0.01*	
Yes	15.3 (242)		19.1 (1586)
No	15.4 (1032)		80.9 (6713)
Early sexual debut		*71.8****	
Yes	25.1 (220)		10.1 (876)
No	14.2 (1054)		89.4 (7423)
In polygynous relationship		*74.1****	
Yes	6.4 (67)		12.6 (1048)
No	16.6 (1207)		87.4 (7251)
Having one partner can reduce HIV transmission		*0.01*	
Yes	15.3 (117)		90.8 (7532)
No	15.4 (1157)		9.2 (767)
Paying sex (past year)		*59.0****	
Yes	38.5 (55)		1.7 (143)
No	15.0 (1219)		98.3 (8156)
Used condom at last sex		*2.1*	
Yes	17.9 (73)		4.9 (409)
No	15.2 (1201)		95.1 (7890)
Husband has right to have sex with other women		*73.9****	
Disagreed	14.1 (104)		88.7 (7363)
Agreed	24.9 (233)		11.3 (936)
Age gap between husband and wife		*54.2****	
Husband 5 yrs older than wife	14.1 (341)		29.2 (2424)
Husband 5-10 yrs older than wife	13.5 (401)		35.7 (2964)
Husband 10-15 yrs older than wife	15.5 (253)		19.6 (1628)

Husband >15 yrs older than wife	22.5 (249)		13.4 (1109)
Husband younger than wife	17.2 (30)		2.1 (174)
Husband drank alcohol		*57.1****	
Yes	18.9 (184)		15.2 (976)
No	10.4 (567)		84.8 (5445)
Intimate partner violence (past year)		*41.7****	
Yes	17.5 (185)		16.4 (1055)
No	10.6 (566)		83.6 (5366)

Notes:

- *Significant levels: *p <0.05; ** p<0.01; *** p<0.001*
- *Husband's drinking and intimate partner violence were reported by the wives [n=6421]*

Table 3: Factors associated with extramarital sex: logistic and multiple logistic regression

	Crude Odds Ratio (95% CI)	*Adjusted Odds Ratio (95% CI)*	
		Model 1: cases with missing values deleted (n=6421)	Model 2: cases with missing values imputed (n=8239)
Age			
15-29	1.0	1.0	1.0
30-44	1.2 (1.0-1.5)*	1.3 (1.0-1.6)*	1.4 (1.1-1.7)*
45-59	1.9 (1.6-2.3)***	1.8 (1.3-2.5)***	2.1 (1.7-2.6)**
Education			
No education	1.0	1.0	1.0
Primary and secondary	1.1 (1.0-1.3)*	1.1 (0.9-1.5)	1.1 (0.9-1.3)
Higher	0.8 (0.7-1.0)	0.9 (0.6-1.4)	0.9 (0.7-1.1)
Household wealth			
Poor	1.0	1.0	1.0
Middle	1.3 (1.1-1.5)**	1.1 (0.8-1.5)	1.1 (1.0-1.3)
Richer	1.1 (0.9-1.3)	1.1 (0.8-1.6)	1.1 (0.9-1.4)
Region			
North	1.0	1.0	1.0
Central	2.0 (1.8-2.4)***	2.1 (1.4-3.0)***	2.1 (1.7-2.5)***
South	1.5 (1.3-1.7)**	1.7 (1.2-2.4)*	1.5 (1.2-1.8)***
Religion			
Christian	1.0	1.0	1.0
Muslim	0.9 (0.8-1.0)	1.2 (1.0-1.7)	1.2 (1.0-1.7)
Traditional/other	1.5 (1.1-2.2)*	1.2 (0.7-2.1)	1.5 (1.0-2.1)
Living in rural area	1.4 (1.2-1.6)***	1.5 (1.1-1.9)*	1.5 (1.3-1.8)***
Away from home for a month in past year	1.0 (0.9-1.2)	------	------
Had first sex at the age of 15 and younger	2.0 (1.7-2.4)***	1.9 (1.5-2.4)***	1.9 (1.6-2.3)***
In polygynous relationship	0.3 (0.2-0.4)***	0.4 (0.3-0.5)***	0.3 (0.2-0.4)***
Agreed that husband has right to have sex with other women	2.0 (1.7-2.4)***	1.9 (1.4-2.4)***	1.7 (1.4-3.0)***
Knew to reduce HIV transmission by having sex with one partner	1.0 (0.8-1.2)	1.0 (0.8-1.4)	1.0 (0.8-1.3)
Paying sex (past year)	3.6 (2.5-5.0)***	4.6 (3.0-7.1)***	3.5 (2.4-5.0)***
Used condom at last sex	1.2 (0.9-1.6)	------	------
Age gap between husband and wife			
Husband 0-5 yrs older than wife	1.0	1.0	1.0
Husband 5-10 yrs older than wife	1.0 (0.8-1.1)	1.1 (0.9-1.3)	1.0 (0.8-1.2)
Husband 10-15 yrs older than wife	1.1 (0.9-1.3)*	1.2 (0.9-1.5)	1.1 (0.9-1.4)
Husband >15 yrs older than wife	1.8 (1.5-2.1)***	2.1 (1.5-2.8)***	1.6 (1.3-2.0)***
Husband younger than wife	1.3 (0.8-1.9)	1.0 (0.6-1.8)	1.0 (0.7-1.6)
Husband drank alcohol	2.0 (1.7-2.4)***	1.5 (1.2-1.8)**	1.8 (1.4-2.2)***
Intimate partner violence (past year)	1.8 (1.5 -2.2)***	1.4 (1.1-1.7)**	1.4 (1.2-1.7)***

Notes: *Significant levels: *p <0.05; ** p<0.01; *** p<0.001*
Husband's drinking and intimate partner violence were reported by the wives