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## Alcohol use and extramarital sex among men in Cameroon

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Published: 3 August 2007

Received: 14 December 2006

*BMC International Health and Human Rights* 2007, **7**:6 doi:10.1186/1472-698X-7-6

Accepted: 3 August 2007

This article is available from: <http://www.biomedcentral.com/1472-698X/7/6>

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### Abstract

**Background:** The spread of HIV in sub-Saharan Africa is believed to be driven by unsafe sex, and identification of modifiable risk factors of the latter is needed for comprehensive HIV prevention programming in the region. Some previous studies suggest an association between alcohol abuse and unsafe sexual behaviour, such as multiple concurrent sexual partnerships and inconsistent condom use in sex with non-spousal non-cohabiting partners. However, most of these studies were conducted in developed countries and the few studies in Africa were conducted among well-defined social groups such as men attending beer halls or sexually transmitted infection clinics. We therefore examined the association between alcohol and extramarital sex (a sign of multiple concurrent sexual partnerships) among men in a population-based survey in Cameroon; a low-income country in sub-Saharan Africa with a high rate of alcohol abuse and a generalised HIV epidemic.

**Methods:** We analyzed data from 2678 formally married or cohabiting men aged 15 to 59 years, who participated in the 2004 Cameroon Demographic and Health Survey, using a multivariate regression model.

**Results:** A quarter of the men (25.8%) declared having taken alcohol before their last sexual intercourse and 21% indicated that the last sex was with a woman other than their wife or cohabiting partner. After controlling for possible confounding by other socio-demographic characteristics, alcohol use was significantly associated with having extramarital sex: adjusted odds ratio (OR) 1.70, 95% confidence intervals (CI) 1.40 to 2.05. Older age (30–44 years: OR 3.06, 95%CI 2.16–4.27 and 45–59 years: OR 4.10, 95%CI 2.16–4.27), higher education (OR 1.25, 95%CI 1.10–1.45), and wealth (OR 1.71, 95%CI 1.50–1.98) were also significantly associated with higher odds of having extramarital sex. The men were more likely to have used a condom in their last sex if it was extramarital (OR 10.50, 95%CI 8.10–13.66). Older age at first sex (16–19 years: OR 0.81, 95%CI 0.72–0.90 and > 19 years: OR 0.74, 95% CI 0.65–0.87) and being the head of a household (OR 0.17, 95%CI 0.14–0.22) significantly decreased the odds of having sex outside of marriage. Religion and place of residence (whether urban or rural) were not significantly associated with extramarital sex.

**Conclusion:** Alcohol use is associated with having multiple concurrent non-spousal sexual partnerships among married men in Cameroon. We cannot infer a causal relationship between alcohol abuse and unsafe sex from this cross-sectional study, as both alcohol use and unsafe sexual behaviour may have a common set of causal personal and social factors. However, given the consistency with results of studies in other settings and the biologic plausibility of the link between alcohol intake and unsafe sex, our findings underscore the need for integrating alcohol abuse and HIV prevention efforts in Cameroon and other African countries with similar social profiles.

## Background

Previous studies suggest an association between alcohol intake and unsafe sexual behaviour [1-4]. Alcohol lowers the cognitive reserve such that people who abuse alcohol are more likely to engage in unprotected sex even with a high risk partner [5]. Corte and Sommers confirmed this association in a recent review, and postulate that alcohol leads to unsafe sex only among persons who have sexual expectancies about the effects of alcohol prior to drinking [6]. This would imply that alcohol leads to unsafe sex for people who have the perception that alcohol will enhance sex or give them courage to approach their sex partners; but have no effect in people who do not have such preconceived ideas. However, it is uncertain whether this hypothesis explains why some studies fail to find an association between alcohol use and unsafe sexual behaviours [7,8].

Most research on the relationship between alcohol use and sexual behaviour has been largely limited to developed countries [9-11], with few studies conducted in sub-Saharan Africa [12-14]. The few studies conducted in sub-Saharan Africa (mostly, in well-defined social settings) have found significant associations between alcohol use and multiple concurrent sexual partnerships and inconsistent condom use with casual partners and sex workers [12-14]. Elsewhere, a study of Vietnamese adolescents found that alcohol use was significantly associated with both engagement in sexual activity and the intention to engage in sexual activity [15].

Research has focused mainly on adolescents, minority groups, migrants, youths, secondary schools and university students [16-20]. Like many other areas of research, men have been largely ignored. Few studies conducted on men have focused on specific groups such as men who have sex with men, men attending beer halls, and truck drivers [21,22], and how alcohol can affect marital life [23]. In a prospective cohort of 14,127 participants in the United States, drinking was found to decrease with age and married men were less likely to drink than unmarried men [24].

Cameroon is a country characterized by both high alcohol intake and high prevalence of HIV [25]. Alcohol consumption in Cameroon is estimated to be 2.6 litres of pure alcohol per capita for men and women older than 15 years [26]. About 41.4% of men and 25.8% of women consume alcohol regularly in Cameroon [26]. The usual diet in Cameroon is rich in alcohol content and excessive alcohol intake is a common finding [27]. Alcohol is consumed for varied reasons, including social, religious, and even medicinal. The trend of drinking patterns is not documented, but applying evidence from elsewhere we expect new drinking patterns to build on old traditional drinking

behaviours along with other social changes [28]. The overall HIV prevalence among resident adult Cameroonians aged 15–49 years is about 5.5%. The prevalence is higher in women (6.8%) than in men (4.1%) [25]. The HIV prevalence varies by marital status: 3.5% among unmarried, 6.2% among married and 18.5% among formerly married (widowed or divorced) persons. The prevalence in monogamous and polygamous families is 6.6% and 5.5% respectively. To sustain a heterosexual HIV epidemic, an (infected) person must have unprotected sex with more than one partner. The only way this can happen in marriage is through extramarital sexual relationships, given that polygamy is not a significant HIV risk factor in our setting. Since alcohol is the most common form of substance abuse in Cameroon [5,26] and is associated with unsafe sexual behaviours in other societies as indicated above, it may be a common and potentially modifiable risk factor for HIV infection in the country. We therefore examined the association between alcohol use and extramarital sex, because men who have such unsafe sexual behaviours are (potential) key agents for the transmission of HIV and other sexually transmitted infections. Although this study focuses on married men, single men who have multiple concurrent sex partners are equally at risk of acquiring HIV infection and (if already infected) of transmitting same to their sex partners.

## Methods

### Design

This cross-sectional and population-based study uses data from the 2004 Cameroon Demographic and Health Survey (DHS). Since the details of the survey methods are published elsewhere [25,29], we provide only a brief description here. Following informed consent, structured interviews were used to obtain information from men aged 15 to 49 years about various socio-demographic characteristics including current sexual activity and alcohol use. The survey was approved by the Ethics Committee of the ORC Macro at Calverton in the USA and by the National Ethics Committee in the Ministry of Health in Cameroon. All information was collected confidentially. We obtained the data from ORC Macro, and have included only married and cohabiting men in our analysis.

### Population and sampling

The survey used a two-stage cluster sampling technique. The country was stratified into 12 domains (i.e. the 10 provinces and the two major cities of Yaoundé and Douala). The provinces were further stratified into urban and rural areas. Each domain was composed of clusters called "enumeration areas", which were established in the 2003 General Population and Housing Census. Within each domain, a two-stage sample was selected. The first stage consisted of selecting 466 clusters (primary sam-

pling units) with the probability of selection proportional to the size; the size being the number of households in the cluster. The second stage involved the systematic sampling of households from the selected clusters. All men aged 15 to 59 years in the selected households were interviewed.

### **Variables**

We selected extramarital sex as the dependent variable and alcohol use as the main independent variable, with potential confounding variables being age of the man, whether the man was the head of the household (or not), level of education, place of residence, age at first sex, socio-economic status, and religion. We defined the variables as follows:

#### *Married men*

Married men as used in this study include all married and cohabiting men.

#### *Extramarital sex*

We defined extramarital sex as the act of having sexual intercourse with another woman other than one's spouse or cohabitating sex partner. Co-habitation or free union is common in Cameroon and some couples have long lasting stable unions without formal marriage (legal or traditional). We excluded all men who were not married or cohabiting from our analysis.

#### *Alcohol use*

Alcohol use was defined as the act of drinking alcohol before the last sexual intercourse. The amount of alcohol taken by the participant was not quantified. But rather, four categories were identified, namely (a) neither the respondent nor his partner took alcohol before the last sex, (b) the respondent took alcohol but the sex partner did not, (c) the sex partner took alcohol but the respondent did not, and (d) both the respondent and his sex partner took alcohol.

#### *Wealth index*

We used the wealth index as a measure of socio-economic status. A score was given to each amenity according to the Health, Nutrition and Population/Poverty Thematic Group of the World Bank [30]. The total score for each household constituted the wealth index score for that household. Each man was assigned the wealth index score of his household [29]. The total score was converted to an ordinal scale with three equal-sized categories based on percentiles of wealth score: < 33.33<sup>th</sup> percentile (poor), 33.33<sup>th</sup> to 66.66<sup>th</sup> percentile (middle), and > 66.66<sup>th</sup> percentile (rich).

#### *Other variables*

Educational attainment was defined as never been to school, primary, and secondary or higher education; age

was stratified into three 15-year age bands (15–29 years, 30–44 years, and 45–59 years); place of residence was defined as rural or urban; and religion as Christians, Muslims, and others.

### **Statistical analyses**

All cases in the DHS data are given weights to adjust for differences in probability of selection and to adjust for non-response in order to produce the proper representation [25]. We used individual weights for statistical analyses in this study, using SPSS version 13.0 for Windows. In the first step of the analyses we described the general characteristics of the study population. We have presented the results as percentages for categorical variables and means (standard deviations) for continuous variables. Secondly, we conducted univariate analyses to examine bivariate associations between each independent variable and extramarital sex using the Chi-square test. Lastly, we constructed a multiple regression model to estimate the relationship between alcohol use and extramarital sex, controlling for potential confounders. The variables entered into the multiple regression model were categorized as follows: age (15–29 years, 30–44 years and 45–59 years), education (primary or less versus secondary or higher), wealth index (low versus high), residence (rural versus urban), religion (Christians versus others), age at sexual debut (< 16 yrs, 16–19 years, and > 19 yrs), head of household (yes versus no), drank alcohol before last sexual intercourse (yes versus no), and condom use during the last sexual intercourse (yes versus no). The cut-off point for wealth index was the median for wealth index variable. All significance tests were two-tailed and statistical significance was defined at the 5% alpha level.

### **Results**

#### **Socio-demographic characteristics of the study population**

A total of 2678 married men aged 15 to 59 years were included in the analysis. The mean age was 37.0 years (standard deviation [SD] 10.5) and the mean age at first intercourse was 18.6 years (SD 4.0). Table 1 shows the socio-demographic characteristics of the study participants. Most participants (45.2%) were aged 30 to 44 years. About 11.5% of the participants had never been to school while 45.5% had at least secondary education. They were evenly distributed between the rural and urban areas: 47.6% and 52.4%, respectively. About two-thirds (67.2%) of the participants were Christians while Muslims constituted almost one-fifth (19.5%). Most of the men were family heads (83.2%), while the rest had different relationships to the family head such as son, son-in-law, grand son, brother, and adopted child. About one-quarter (25.8%) of the men declared that they took alcohol before their last sexual intercourse and one out of five (21%) indicated that his last sex was with a woman other than his wife or cohabiting partner.

**Table 1: Percentage distribution of married Cameroonian men by selected characteristics, Cameroon Demographic and Health Survey 2004**

Characteristic	Percentage
<b>Age (years)</b>	
15–29	28.2
30–44	45.2
45–59	26.6
<b>Education</b>	
No school	16.9
Primary	37.6
Secondary or higher	45.5
<b>Residence</b>	
Rural	47.6
Urban	52.4
<b>Religion</b>	
Christians	67.2
Muslims	19.5
Others	13.3
<b>Age at first intercourse (years)</b>	
< 16	18.7
16–19	46.5
> 19	34.4
<b>Head of household</b>	
Yes	83.2
No	16.8
<b>Drank alcohol before last intercourse</b>	
No	73.3
Yes	26.7

### <sup>s</sup> **Univariate analyses**

We present the unadjusted odds ratios (OR) and their 95% confidence intervals (CI) for the bivariate association between extramarital sex and each independent variable in Table 2. The first category of each independent variable is taken as the reference category (and given an OR of 1.00) and the effect of the other categories on extramarital sex is compared with this reference category.

The odds of having extramarital sex increased with age, educational attainment, and wealth index (all  $p < 0.001$ ). In addition, men resident in urban areas were twice as likely as rural men to have extramarital sex (OR 2.08, 95%CI 1.72 to 2.54). Similarly, condoms were more likely to be used in extramarital sex than in sex within marriage (OR 14.28, 95%CI 12.50 to 20.00). Compared to Christians, Muslims were less likely to engage in extramarital sex (OR 0.59, 95%CI 0.45 to 0.77). Family heads were equally less likely to engage in extramarital sex (OR 0.19, 95%CI 0.15 to 0.23). Older age at sexual debut also decreased the odds of having extramarital sex: OR 0.67 (95% CI 0.54 to 0.85) for age 16–19 years and OR 0.31 (95% CI 0.24 to 0.41) for age 19 years or older, compared to less than 16 years.

On examining the effect of alcohol use before the last sexual intercourse, we found that if only the respondent or his partner took alcohol there was no significant association with having extramarital sex. However, when both partners took alcohol the odds of having extramarital sex increased almost two-fold ( $p < 0.001$ ).

### **Multivariate analyses**

We constructed a multiple regression model based on the factors identified in univariate analyses as having significant associations with extramarital sex. The independent variables entered into the model were age, education, wealth, residence, religion, age at first sex, condom use during last sex, and alcohol intake before last sex. Alcohol use was reduced to two categories according to whether or not the respondent had taken alcohol himself before the last sexual intercourse, irrespective of whether his partner also took alcohol.

Table 3 shows the results of these multiple regression analyses. Alcohol use was significantly associated with increased odds of having extramarital sex, after controlling for potential confounding by age, head of household status, education, religion, age of sexual debut, wealth, and condom use (OR 1.70, 95%CI 1.40 to 2.05).

Other characteristics which were independently associated with increased odds of having extramarital sex included age (30–44 years: OR 3.06, 95%CI 2.16 to 4.27 and 45–59 years: OR 4.10, 95%CI 2.16 to 4.27), higher education (OR 1.25, 95%CI 1.10 to 1.45), and wealth (OR 1.71, 95%CI 1.50 to 1.98). In addition, the odds of using a condom increased during extramarital sex (OR 10.50, 95% CI 8.10 to 13.66). Men who were heads of household were less likely to engage in extramarital sex (OR 0.17, 95%CI 0.14 to 0.22), just like men who first sex when they were older than 16 years (16–19 years: OR 0.81, 95%CI 0.72 to 0.90 and > 19 years: OR 0.74, 95% CI 0.65–0.87). However, after controlling for confounding by other factors, religion ( $p = 0.086$ ) and place of residence ( $p = 0.245$ ) were no longer significantly associated with having extramarital sex.

Many predictor variables were significantly correlated with each other. Man's age was negatively correlated to age at sexual debut ( $p < 0.001$ ). Religion was positively correlated to age at sexual debut ( $p < 0.001$ ). Education was positively correlated to religion ( $p < 0.001$ ), age at sexual debut ( $p < 0.001$ ), and wealth index ( $p < 0.001$ ). However, there was no significant correlation between condom use and drinking alcohol before sex ( $p = 0.40$ ), despite the fact that both factors were significantly associated with extramarital sex.

**Table 2: Bivariate association between extramarital sex and selected characteristics of married Cameroonian men, 2004**

Characteristic	Extramarital sex		OR (95%CI)	p-value
	No	Yes		
<b>Age (years)</b>				
15–29	490	266	1	-
30–44	1001	206	8.95 (7.24–11.06)	< 0.001
45–59	626	87	13.25 (10.13–17.38)	< 0.001
<b>Education</b>				
No school	418	35	1	-
Primary	802	204	3.04 (2.10–4.48)	< 0.001
Secondary or higher	897	323	4.30 (3.00–6.29)	< 0.001
<b>Wealth index</b>				
Poor	794	98	1	-
Middle	674	220	2.64 (2.03–3.46)	< 0.001
Rich	649	244	3.34 (2.34–3.98)	< 0.001
<b>Residence</b>				
Rural	1087	189	1	-
Urban	1029	373	2.08 (1.72–2.54)	< 0.001
<b>Religion</b>				
Christians	1379	420	1	-
Muslims	443	80	0.59 (0.45–0.77)	< 0.001
Others	294	62	0.69 (0.51–0.93)	0.014
<b>Age at first intercourse (years)</b>				
< 16	346	155	1	-
16–19	956	289	0.67 (0.54–0.85)	0.001
> 19	809	114	0.31 (0.24–0.41)	< 0.001
<b>Head of the household</b>				
No	229	221	1	-
Yes	1888	340	0.19 (0.15–0.23)	< 0.001
<b>Drank alcohol before the last intercourse</b>				
None	1540	323	1	-
Respondent only	373	88	1.12 (0.86–1.47)	0.378
Partner only	31	8	1.23 (0.48–2.27)	0.605
Both respondent and partner	169	62	1.75 (1.25–2.42)	< 0.001
<b>Condom use during the last intercourse</b>				
No	2025	225	1	-
Yes	158	270	14.28 (12.50–20.00)	< 0.001

OR, odds ratio; 95%CI, 95% confidence intervals

## Discussion

We observed that drinking alcohol significantly increased the odds of extramarital sex in Cameroon. Overall, 21% of our participants reported that their last sexual intercourse was outside of marriage. This is higher than what has been reported in other African countries, for example, Mitsunaga and colleagues reported in 2003 that 11% of men have extramarital sex within a year in Nigeria [31]. The differences in the prevalence of extramarital sex may either reflect differences in sexual behaviours in different populations [32,33] or be due to the fact that we included cohabiting relationships in our study. Cohabitation is a common feature in Cameroon and sometimes cohabiting couples never get formally married throughout their lives. All the studies, however, prove that extramarital sex remains common despite being an unacceptable practice in almost all societies. In a survey in Australia, most peo-

ple agreed that premarital sex was acceptable, that oral sex was considered normal sex, that sex was important for a sense of well-being, and that extramarital sex was unacceptable [34].

The association between alcohol intake and unsafe sex has been reported elsewhere. Gibney and colleagues reported an association between alcohol use and having sex with commercial sex workers among truck drivers in Bangladesh in 2003 [22] and Tveit and collaborators reported less frequent use of condom among Norwegian men who combined alcohol intake and casual sex in 1996 [34]. More recently, Weiser and collaborators found in a population-based survey in Botswana that men who abuse alcohol were three to four times more likely to have multiple (concurrent) sex partners and unprotected sex and to engage transactional sex than non-drinkers [13].

**Table 3: Factors associated with extramarital sex in Cameroonian men identified by multiple regression analysis**

Characteristic	Odds ratio	95% CI	p-value
<b>Drank alcohol before last intercourse</b>			
no	1	-	-
yes	1.70	1.40–2.05	< 0.001
<b>Head of household</b>			
no	1	-	-
yes	0.17	0.14–0.22	< 0.001
<b>Man's age</b>			
15–29 yrs	1	-	-
30–44 years	3.06	2.16–4.27	< 0.001
45–59 years	4.10	3.50–5.71	< 0.001
<b>Education</b>			
primary or less	1	-	-
secondary or higher	1.25	1.10–1.45	< 0.001
<b>Religion</b>			
Christians	1	-	-
Others	0.90	0.81–1.04	0.086
<b>Age of first intercourse</b>			
< 16 yrs	1	-	-
16–19 years	0.81	0.72–0.90	< 0.001
> 19 years	0.74	0.65–0.87	< 0.001
<b>Wealth index</b>			
low	1	-	-
high	1.71	1.50–1.98	< 0.001
<b>Residence</b>			
rural	1	-	-
urban	1.13	0.90–1.42	0.245
<b>Condom use during last intercourse</b>			
no	1	-	-
yes	10.50	8.10–13.66	< 0.001

CI, confidence intervals

Consistent with the findings of other studies [36–39], we found associations between several other factors and extramarital sex. Having first sexual intercourse before 16 years of age was a predictor of extramarital sex compared to having the first sexual intercourse after 16. In addition, older men were more likely to have extramarital sex than their younger counterparts. Being the head of a household also significantly decreased the odds of having extramarital sex. Four-fifths of our study population were heads of their households. In most African societies, men are the sole bread winners and the heads of their households. Men who were not heads of households were either related to the household head as a son, brother, son-in-law or other relatives. As the head of the household a man is probably less likely to engage in extra-spousal sex because he is more responsible and attached to his spouse(s) than men who are no heads of households.

We did not examine the effect of occupation on extramarital sex, although it has been reported in the literature [40]. However, we used other proxies of socio-economic status such as wealth index and level of education. Education and wealth index were both found to be significantly associated with having extramarital sexual relationships. This finding has not been consistent across the board [36,41]. While no association was found between socio-economic status and extramarital sexual relationships in Zambia [36] this was found to be the case in the United States of America [41]. The association between economic well being and multiple concurrent sexual relationships is to be expected because men with more resources have greater access to women than poorer men [42].

The present study has several limitations. Secondary analysis of data collected for a different purpose is limited by the data available, and information on some useful factors which could confound the relationship between alcohol use and extramarital sex may be lacking. In addition, men who have extramarital sex when drinking may also have lots of extramarital sex when not drinking. Furthermore, due to the cross-sectional nature of this study, the findings can only indicate associations and not causality [43] because unsafe sexual behaviour and alcohol use may have a common set of causal factors which are unknown or difficult to measure [44]. However, the consistency of study results across different settings [9–15,22,34], biologic plausibility [5,45], dose-response relationship [13], and strength of the association suggest that alcohol use is a cause rather than a consequence of unsafe sexual behaviour.

## Conclusion

Alcohol use is associated with having extramarital sex, a sign of multiple concurrent sexual partnerships, among married men in Cameroon. We cannot infer a causal relationship between alcohol abuse and unsafe sex from this cross-sectional study as both alcohol use and unsafe sexual behaviour may have a common set of causal personal and social factors. However, viewed in the context of the results of studies in other countries, the biologic plausibility and dose-response relationship between alcohol intake and unsafe sex, our findings underscore the need for integrating alcohol abuse and HIV prevention efforts in Cameroon and other countries in sub-Saharan Africa with similar social profiles.

## Competing interests

The author(s) declare that they have no competing interests.

## Authors' contributions

EJK conceived the study, extracted the data, did the analyses and interpretation, and wrote the first draft of the

manuscript. CSW participated in the interpretation and critically revised the manuscript for important intellectual content. Both authors read and approved the final manuscript.

## Acknowledgements

The authors are grateful to Measure DHS for providing them with the 2004 Cameroon DHS data.

The authors thank Ulla Larsen, Ron Stall, and Lance Weinhardt for critical review of an earlier version of this manuscript.

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## Pre-publication history

The pre-publication history for this paper can be accessed here:

<http://www.biomedcentral.com/1472-698X/7/6/prepub>