Sexual Concurrency in Uganda, Zambia and Zimbabwe: the role of gender, economic status, and migration

Megan Klein Hattori (megan_klein_hattori@brown.edu), Sarah Braun, Hope Chapman, Carolyn Chuong, Monique Morales, and Sushant Wagley

Since its entrance onto the global scene in the early 1980's HIV has spread to every corner of the world. The universal effects of the epidemic are undeniable; however, no region has been so severely affected as that of sub-Saharan Africa. Despite the continued efforts of domestic and international organization, the region was estimated in the 2007 UNAIDS report to house nearly 67 percent of the 32.9 million people living with HIV globally. Although the average prevalence on the continent is well above the prevalence in the majority of nations worldwide, there are staggering rates in many nations where the prevalence is nearly 20 percent.[1] Much speculation has arisen as to what is driving the extreme global disparities in HIV. Recently attention has focused on the possibility that sexual concurrency—having two or more overlapping sexual partnerships for a prolonged period of time (Mah and Halperin 2008)—could be a key driver of both the uniqueness and severity of the Sub-Saharan epidemic.[2] Micro simulation studies suggest an important role for concurrency in the spread of HIV. Given the devastation brought about by the HIV epidemic the suggestion of a relationship between concurrency patterns and HIV prevalence lends a greater importance to understanding the factors associated with sexual concurrency.

In contrast with regions where marriage is exclusively monogamous, polygamy offers a second model of moral sexual behavior—a model where an individual can maintain long-term sexual relationships with more than one partner. Research suggests that concurrent sexual partnerships contribute more to the spread of HIV than serial monogamy (Morris and Kretzschmar 2000). In contrast, serial monogamy—when individuals have many partners over time, yet only one partner at a time—may be as effective as partner reduction (Morris and Kretzschmar 2000). Finally, even relatively small reductions in annual number of partners—in simulations from 1.7 to 1.3 partners per year—can have dramatic effects on the HIV prevalence rate at the population level (Korenromp et al. 2000).

According to Cassels and colleagues (2008), one factor that contributes to the effect of concurrency on HIV transmission is the destruction of the protective effect of sequencing that

serial monogamy provides. Under serial monogamy an individual's earlier partners are not exposed to infection that the individual picks up from a later partner. If partnerships are concurrent, however, earlier partners remain connected to the individual, and can be exposed when he or she becomes infected by a later concurrent partner. In addition, concurrency reduces the waiting time between infections because partnerships in which a transmission occurs do not have to end before the next one begins (Cassels et al., 2008). These effects of concurrency are amplified by the fact that viral load, and thus infectiousness, varies by stage of infection (Halperin and Epstein, 2004). The probability of transmission peaks at the early stage of infection, defined by the initial spike in viral load and infectiousness, which can last from a few weeks to 6 months. Then, the probability of transmission decreases during the latent stage, when viral load and infectiousness remain low, and increases once more during the symptomatic stage, which includes the onset of AIDS when the viral load rises again (Cassels et al., 2008). Therefore, as soon as one person in a network of concurrent partnerships contracts HIV, everyone else in the network is quickly placed at risk, and more people are exposed during the early peak infectivity period. By contrast, serial monogamy traps the virus within a single relationship for months or years, perhaps beyond the peak of infectivity (Epstein, 2007).

Fidelity or serial monogamy as a means to prevent HIV may, in a manner similar to family planning, be seen as contrary to the local models of sexual behavior and may experience resistance (Watkins 2000). Lengthy periods of postpartum abstinence are often cited as a justification for extramarital relations in Malawi (Watkins 2004). Additionally, having multiple partners can be seen as a symbol of masculinity (Silberschmidt 2001; Watkins 2004). Both men and women justify extramarital affairs when they are not satisfied with their spouses or when conceiving has become difficult (Silberschmidt 2001; Watkins 2004; Hollos and Larsen 2008).

Maintaining multiple partnerships is often identified as a means for poor women to achieve some level of financial security (Watkins 2004; Hattori and Dodoo 2007). Transactional sex—engaging in sexual relations in exchange for money, food, or favors to meet their needs—may be a survival strategy for some poor women (Zulu, Dodoo, and Chika-Ezeh 2002; Dodoo, Sloan, and Zulu 2003; Longfield et al. 2004). Hattori and Dodoo found that among women residing in Nairobi's slums, those with co-wives were more likely to report multiple partners in the past year (Hattori and Dodoo 2007). Women in polygamous unions may have to share their husbands' incomes with co-wives and may experience a greater need to exploit sexual networks

(Hattori and Dodoo 2007). Further, within context of the Nairobi slums, relative economic hardship remained an important predictor: women with greater economic hardships were more likely to report multiple partnerships (Hattori and Dodoo 2007). This is consistent with men's fears in Dar es Salaam that if they can no longer support their family, their wives might begin relationships with other men who can provide them support (Silberschmidt 2001).

The tie between economic status and the number of partners is highlighted in Swidler and Watkins (2007) article about transactional sex in Malawi. They describe transactional sex in Malawi as part of a patron-client system of dependence. Dependence is mostly built upon the women's need for patrons to provide them with material benefits and men's need for clients to display their power, prestige, and social dominance. Patron-client system of dependence may give rise to concurrent relationships as women, due to economic conditions, may not be able to – or may not want to – be a client to only one man. Similarly, wealthy men may be compelled to have many partners due to established community expectations that call for redistribution of his wealth (Swidler and Watkins, 2007). Patron-client dependence is built on the transaction of sex and therefore can give keen insight into understanding economic and social factors that influence concurrency.

Patterns of sexual behavior have important implications for HIV transmission. Ecological and associational evidence from generalized epidemics suggests a consistent pattern of substantial decline in the proportion of men and women who report having had more than one sex partner or one or more casual partners in the previous year, followed by population-level declines in HIV infection occurring three to five years later. No other behavior changes for which there are data, including increased condom use, show this strong pattern of association across multiple generalized epidemics (Green et al., 2009). In order to better understand how to change such sexual behaviors, identification of the determinants of concurrency in a population is crucial. This paper examines concurrent sexual partnerships among men and among women in Uganda, Zambia, and Zimbabwe using recent Demographic and Health Surveys which allow for the measurement of concurrency. The factors related to concurrency under consideration in this paper are gender and domestic relations, economic status, and migration.

BACKGROUND

Upon examination of HIV/AIDS-related sexual decision-making and negotiation in sub-Saharan Africa, studies point to gender norms, economic hardship, and migration as central factors driving multiple-partnered sexual relationships (McGrath et al., 1993; Epstein, 2007; Hunter, 2002; Silbershmitt 2001). Hunter (2002) explores the privileged economic position of men in South Africa, which he argues is rooted in their access to the most lucrative segments of the formal and informal economy, as well as to resources such as housing. Hunter proposes that this economic inequality provides a material basis for transactional sex, in which sexual relationships are underscored by the giving of gifts or cash. One of Hunter's focal arguments is that women approach transactional relations not as passive victims, but in order to access power and resources, whether for subsistence or consumption. Not only are women in transactional relationships more likely than other women to tolerate an unfaithful partner, but they are also more likely to seek out additional concurrent sexual relationships themselves (Epstein, 2007). This argument is supported by McGrath and colleagues (1993) who found that, despite a high level of AIDS awareness, women in Uganda accepted multiple sex partners from economic need. South African researchers achieved similar findings which suggest that women who have transactional sexual relationships may have multiple relationships concurrently, with one man providing money for groceries, another clothes, and so forth (Dunkle et al., 2004). Additionally, researchers in Zimbabwe interviewed teenage girls living in the slums around Harare and found that most were involved in transactional relationships, despite the risk of HIV infection, because their economic difficulties were a greater concern for them than AIDS was. Though few of the girls were truly destitute, their impoverished lives led them to place great value on small gifts of cash, jewelry, makeup, and clothes (Epstein, 2007).

Uganda

Uganda is considered to be one of the earliest and most compelling national success stories in combating the spread of HIV, and some argue that a decrease in multiple sexual partner behavior was primarily responsible for Uganda's success (Green et al., 2006). HIV prevalence in Uganda peaked in the early 1990s, reaching 30 percent in some urban areas, but this rate has since fallen to 5.4 percent among adults aged 15 to 49 (UNAIDS, 2008). Although knowledge of AIDS is universal in Uganda (UDHS, 2006), Opio and colleagues (2008) found that between 2001 and 2005, the proportion of respondents aged 15 to 49 years who reported having sex with

two or more partners in the past year increased from two percent to four percent in women and from 24 percent to 29 percent in men. Furthermore, they found that the proportion of married respondents who reported sex with someone other than a spouse in the 12 months preceding the survey increased slightly for women from two percent in 2001 to three percent in 2005, but substantially for men from eleven percent in 2001 to 18 percent in 2005. These important HIV-related behaviors and knowledge indicators have recently deteriorated, and Opio and colleagues argue that there is a shift toward more risk-taking sexual behaviors among Ugandans. These findings have raised concern as they parallel a halted decline in HIV prevalence and incidence (Opio et al., 2008). Therefore, these results indicate a need to reinvigorate and adopt additional prevention approaches, even in Uganda, a country with longstanding HIV prevention programs and successes.

Canagarajah and colleagues (2001) found that in Uganda women made around 85 percent less in earnings than men, controlling for other factors. According to Ellis and colleagues (2006), the vast majority of women in Uganda work in agricultural subsistence work, and women are more active than men in agriculture. By contrast, men predominate in the formal economy, where they represent 61 percent of employees, while most women are self-employed or work as unpaid family workers. Ellis and colleagues assert that, in addition to their prominence in agriculture, women bear the brunt of domestic tasks, and that women's workdays may be 50 percent longer than men's. They argue, therefore, that time constraints affect women disproportionately, and that business registration or gaining access to banks and other financial institutions that involves travel, waiting, or delays constitute an especially heavy burden for women. Finally, they report that female entrepreneurs face a clear gender bias in access to credit, receiving just nine percent of available credit (and only about one percent in rural areas). While women do have access to informal saving mechanisms and microfinance, the high interest rates, small loan sizes, and short-term nature of the loans mean that women can become trapped in the informal sector and unable to expand their businesses.

Zambia

An estimated 14 percent of the adult population in Zambia is HIV positive. The Zambia Demographic and Health Survey (ZDHS) indicates that women (ages 15-49) have higher HIV prevalence than men with respective 16 percent and 12 percent infection rates (2007).

Kimuna and Djamba's (2005) research among men in Zambia found higher proportion of sex outside of marriage in men aged 15-29 (24 percent) than men aged 30-39 (20 percent) or men 40 or older (12 percent). Qualitative research suggests that men ages 16 to 26 in Zambia had multiple sexual partners because they believed that it was difficult to control their sexual desires due to their young age (Ndubani and Höjer 2001). When asked about reasons behind multiple partnerships, one young man explained "it was good to experiment with manhood before marriage" (2001:110). Ndubani and Höjer (2001) argue that sexual behavior among young men does not differ between rural and urban settings and that perception of manhood still influence sexual behavior.

In Zambia early sexual debut, marital status, and absence from home are important predictors of concurrency (Sandøy et al 2008). Sandøy and colleagues (2008) suggest that the loneliness created by separation from primary partner and increased anonymity and less social control lead to a higher likelihood of having concurrent relationships. Michelo and colleagues' (2006) findings from Zambia associate higher mobility in men with increased risk of infection. Migrant workers are a large population that is at risk of finding multiple partnerships when away from home, putting themselves and members in their network at risk.

Although post-independence reforms had initial success in educating the population and equalize employment opportunities between sexes, the plummeting prices of Zambia's key export, copper, at the start of the 1980's brought about a massive shift in the economy of Zambia. The decline of copper spiked a rise in unemployment to nearly 50 percent in 2000 [10], which in turn had the dual effect economy back towards agriculturally based labor and not only reduced the educational opportunities for all Zambians (especially females) but provided men an employment advantage.[11] Thus, the effects of these economic shifts have undoubtedly affected the economic and social worlds of both males and females in Zambia; this paper will attempt to assess the effects of these forces on concurrency patterns.

Zimbabwe

Zimbabwe is one of seven African countries in which HIV prevalence exceeds 15 percent—the current estimate lies at 18 percent (UNAIDS; DHS). A recent nationally representative survey conducted by Population Services International (PSI) found that eleven percent of all sexually active adults in Zimbabwe reported engaging in a concurrent sexual

relationship in the past month[2] and 13 percent of married or cohabitating respondents reported sex with someone other than the main partner within the past month. The study found sex differences in reporting concurrent relationships. While one in five married or cohabitating men reported another sexual relationship, only five percent of women reported the same (PSI, 2008). However, women ages 15 to 49 face higher rates of HIV prevalence (21 percent versus 15 percent among men of the same age group), a finding echoed across southern and eastern Africa. Women are at increased risk for HIV infection despite reporting engaging in multiple concurrent relationships at a rate lower than men. Although polygamy is not a legally recognized form of marriage in Zimbabwe, it remains fairly common practice; in 1995, 19 percent of currently married women were in a polygamous union (Sibanda, 2000).

A qualitative study of women around Mount Selinda, Zimbabwe found that female children are taught from a young age that they are not as important as their brothers because they will not carry on the family name (Duffy, 2005). Married women reported that only the husband can decide if condoms are used; in addition, he can demand sex at any time regardless of his wife's desire (Duffy, 2005). Gender inequality is also associated with violence against women in Zimbabwe. In a study of one province in Zimbabwe, 42 percent of women reported having experienced psychological abuse throughout their lifetime, 32 percent reported physical abuse, and 37 percent recalled some form of sexual harassment or sexual abuse (Watts et al, 1997). Such violence may limit a woman's ability to refuse sex and influence her engagement in concurrent sex.

A study of nearly 1000 students at the University of Zimbabwe in 2005 also shows large differences between men and women in beliefs of gender equality within sexual decision-making (Terry et al, 2005). These results are important because they show that even among the most highly educated, gender inequality remains entrenched.

Much like gender norms constrain women, they can also place pressure upon men to prove their masculinity (Gupta, 2000). One way of enacting masculinity is by having multiple sexual partners (Sibanda, 2000). Within Zimbabwe, a not uncommon practice is to have a "small house," or an extramarital affair with another woman. For men, social pressure from peers and perceived costs about loss of social status were important drivers in having more than one regular partner (PSI 2008).

Zimbabwean women have historically been placed at an economic disadvantage as a cause of the patriarchal system, low levels of education, and a lack of property inheritance rights (Sibanda 2000). These women today often supplement low incomes with money or gifts from sexual partners other than their husbands (Bassett and Mhloyi, 1991). Material benefits of concurrent sexual partnerships cited by women included food, shelter, school fees, and transport (PSI 2008). Conversely, wealthier women in Manicaland were less likely to engage in transactional sex, to have casual partners, or to have more than one partner in the three years between the baseline and follow-up of the study (Lopman et al, 2007).

Due to the limited employment opportunities for women in Zimbabwe, even the relatively privileged employed women "may be forced to exchange sex for job security" (Bassett and Mhloyi 1991). The findings of these studies point to an important relationship between economic instability and concurrent relationships for women in Zimbabwe.

The patterns of migrant labor in Zimbabwe have greatly influenced the institution of marriage. During colonialism, European settlers expropriated land and many male Zimbabweans were relocated to labor reserves or mines in urban areas. Out-migration of men steadily increased and in the early 1980s, the percentage of men ages 25-44 who moved from rural to urban areas ranged from 50-75 percent (Mazur, 1987). Turmoil due to unsuccessful land reform and resettlement policies has hurt the stability of agricultural production and few opportunities exist for men whose livelihood depends on farming (Uusihakala, 2007). This lack of stability may continue to push men into urban areas in search of economic employment.

Such rural-to-urban migration has led to the "two-legged family" in which the husband and wife do not live together for most of the year. Other sub-Saharan African countries, such as Botswana, Namibia, Mozambique, and South Africa, have seen a similar phenomenon (Sibanda, 2000). Zimbabwean men may also move away from their home to work as haulage truck drivers or long-distance bus drivers. Zambia, Angola, Malawi, and Tanzania exchange goods with South Africa, and Zimbabwe is in a central location of this trade. The developed infrastructure and highway system of Zimbabwe have allowed the country to facilitate this trade and movement between rural and urban areas (Sibanda, 2000).

Such family separation holds strong implications for the sexual behavior of both the husband and wife. Husbands often form regular sexual relationships with partners away from the home in the urban workplace, while truck and bus drivers maintain regular partners at rest stops

or at the destination of their route (Sibanda, 2000). In the absence of their husbands and facing substantial financial crisis, women may begin form sexual partnerships in which they receive money or gifts (Bassett and Mhloyi, 1991).

DATA AND METHODS

All data from the DHS were collected through self-reporting during face-to-face interviews. Due to the sensitive and private nature of sexual behavior, there are limitations to the validity of data collected on this topic as individuals are less likely to accurately and honestly report behaviors. Some argue that self-reports of sexual behavior are inherently unreliable and invalid due to multiple sources of bias, including underreports of stigmatized behaviors and overreports of normative behaviors (Lewontin, 1995). This is supported by Nnko and colleagues' (2004) findings that in population-based surveys on sexual behavior, men consistently report higher numbers of sexual partners than women, which may be associated with male exaggeration or female underreporting, or with issues related to sampling, such as exclusion of female sex workers. Despite these criticisms and concerns, researchers and practitioners continue to rely on self-report methods to assess sexual behavior because ethical and practical considerations limit the use of more direct assessment methods (Weinhardt et al, 1998).

Indicators

We define concurrency as whether or not the respondent reported two or more partners in the past two months. We use an indirect measure of concurrency, where individuals were asked about their most recent sexual partner, including the last time they had sexual intercourse with that partner. If the respondent reported more than one partner in the past 12 months, the respondent was then asked about the partner before their most recent partner, including the last time they had sexual intercourse with that partner. Finally, if the respondent had more than two partners in the past 12 months, the respondent was then asked about this third partner, including the last time they had sexual intercourse with the third partner. For each respondent, we generated a count of how many out of the three possible partners the respondent had sexual intercourse in the past two months. This indirect measure of concurrency is likely to be subject to less of a social desirability bias than a measure that directly asks the respondent the number of sexual partners in the past year. However, indirect measures of concurrency based on reported

dates are subject to estimation and rounding errors for each partner. Limiting our analysis to concurrent sexual acts within the past two months, motivated by the window of peak infectivity, is less subject to the effects of estimation than an analysis that attempts to match sexual encounters that are less recent. This measure of concurrency gives us a snapshot of multiple sexual partnerships in two months.

After describing our sample of women who reported being sexually active in the past 12 months, Table 2 presents the results of the bivariate analysis comparing the percent of respondents reporting two or more partners in the past two months by our variables of interest and background characteristics using the Pearson χ^2 test. The factors associated with concurrent sexual partnerships in the past two months were analyzed using a multivariate logistic regression model to estimate the odds ratios (OR) and 95-per-cent confidence intervals (CI). The results of the multivariate logistic regression model are presented in Table 3.

The DHS questionnaire includes information on the respondents' background characteristics, including age, marital status (never married, currently married [reference category], formerly married), marital structure (monogamous [reference category] or polygamous; co-residential [reference category] or not), fertility (whether the respondent had a child before the second year of marriage [reference category] or not), household amenities and possessions (reference category is the average for the country), level of education (reference category is primary schooling), recent mobility (number of trips away the respondent made in the last 12 months: none [reference category], 1-2 trips, 3-4 trips), labor force participation (if the respondent worked or not [reference category]; if the respondent received any payment for work in cash or not [reference category]), and residence (rural or urban [reference category]). The questionnaire also covers issues related to household decision-making (measured as two dichotomous variables, one indicating if the respondent has final say on any household decisions, and one variable indicating if the respondent makes any household decisions jointly with a spouse, [reference is respondent does not have final say on any decisions]), sexual decision-making (a count variable as to whether the respondent cannot refuse sex or cannot ask spouse to use a condom), and attitudes related to domestic violence (a count variable indicating if the respondent reports that a husband is justified in hitting or beating his wife in the following situations: if she goes out without telling him, neglects the children, argues with him refuses to have sex with him or burns the food) as well as sexual behavior (if the respondent had their first

sex before age 15 or not [reference category]; if any alcohol was consumed in their last sex with any partner or not [reference category]) and knowledge of the three methods to prevent HIV (a count variable).

Table 2: Predicted odds ratio of reporting more than one partner in the past year among Ugandan females ages 15-49 (N=6268)

	OR	95% Confidence Interval	p-value
Current marital status			
Never married	9.89	0.74-132.61	
Currently married (reference)	1.00	-	-
Formerly married	4.69	0.91-24.07	
Cohabitation			
Husband living with woman (reference)	1.00	-	-
Husband staying elsewhere	0.24	0.35-1.67	
Number of other wives			
No other wives (reference)	1.00	-	-
1 or more	0.73	0.29-1.81	
Married for at least 2 years without having children			
Yes	1.38	0.25-7.51	
No (reference)	1.00	-	-
Age			
15-19	1.64	0.57-4.74	
20-29	1.73	0.90-3.35	
30-39 (reference)	1.00	-	-
40-49	0.63	0.23-1.67	
Wealth			
Poorest	0.26	0.07-0.91	
Poor	0.29	0.10-0.87	
Middle (reference)	1.00	-	-
Wealthy	1.16	0.54-2.51	
Wealthiest	1.19	0.52-2.77	
Education			
None	1.90	0.87-4.14	
Primary (reference)	1.00	-	-
Secondary or higher	0.74	0.34-1.59	
Number of trips in last 12 months			
None (reference)	1.00	-	-
1 or 2	1.95	0.97-3.89	
3 or more	2.59	1.29-5.19	**
Place of residence			
Rural (reference)	1.00	-	-
Urban	0.63	0.29-1.38	
Who makes decisions			
Respondent makes decisions alone	2.42	1.03-5.67	*
Respondent's husband makes decisions alone (reference)	1.00	-	-
Respondent and husband make joint decisions	0.30	0.13-0.68	**

Table 3: Predicted odds ratios of reporting more than one partner in the past year (N=6268)

Respondent cannot refuse sex with husband and cannot request condom use with husband			
Yes	0.60	0.14-2.64	
No (reference)	1.00	-	-
Respondent worked in the last 12 months			
Yes	0.66	0.22-1.96	
No (reference)	1.00	-	-
Respondent paid for work in cash or in cash and in kind			
Yes	1.76	0.84-3.68	
No (reference)	1.00	-	-
Alcohol consumption during Sex			
Yes	5.19	2.96-9.12	***
No (reference)	1.00	-	-
First sex before age 15			
Yes	1.89	1.07-3.33	*
No (reference)	1.00	-	-
Knowledge of HIV Prevention	1.19	0.76-1.85	
Respondent believes it is ever acceptable for a husband to hit or beat his wife			
Yes	1.00	0.85-1.18	
No (reference)	1.00	-	-
Transactional sex in the past 12 months			
Yes	5.34	2.87-9.94	***
No (reference)	1.00	-	-

Log likelihood = 510.04

*p<0.05, ** p<0.01, *** p<0.001

Table 3: Predicted odds ratio of reporting more than one partner in the past year among Zambian men ages 15-49			
	Odds Ratio	*p-value*	95% CI
Union status			
Married and co-residing	1.00		
Never married	1.28	.49	.639-2.568
Not co-residents	.768	.42	.403-1.465
Widowed/Divorced	.814	.45	.475-1.393
Polygamous relationship	.688	.22	.378-1.253
Age			
15-19	.899	.72	.054-1.604
20-29	1.75	.001***	1.331-2.308
30-39 (reference)	1.00		
40-49	.591	.01*	.390-.895
Education			
None	1.02	.96	.588-1.755
Primary (reference)	1.00		
Secondary or higher	1.05	.70	.812-1.365
Residence			
Urban	.709	.08	.484-1.037
Rural (reference)	1.00		
Had an early first sex			
First sex 15 or older (reference)	1.00		
First sex before age 15	1.40	.03*	1.041-1.888
Alcohol consumption at last sex			
Consumed	3.48	.001***	2.668-4.453
Not consumed (reference)	1.00		
Transaction during last sex			
Some sort of transaction	4.97	.001***	3.486-7.094
No transaction	1.00		
Employment in the past 12 months			
Employed	1.58	.06	.984-2.592
Unemployed (reference)	1.00		
Wealth index			
Poorest	1.04	.83	.727-1.486
Poor	.620	.03*	.408-.942
Average (reference)	1.00		
Wealthy	1.24	.31	.820-1.873
Wealthiest	.992	.97	.603-1.631
Trips away in the past 12 months			

Table 3: Predicted odds ratio of reporting more than one partner in the past year among Zambian men ages 15-49			
No trips (reference)	1.00		
1 or 2 trips	1.30	.08	.973-1.743
3 or more trips	2.41	.001***	1.841-3.147
Children			
1+ child (reference)	1.00		
No child after 2+ years of marriage	2.72	.03*	1.133-6.524
Prevention knowledge index			
Prevention knowledge	.804	.002**	.702-.921
No prevention knowledge	1.00		
Views on partner violence			
Ok to beat partner	1.07	.08	.993-1.143
Not ok to beat partner	1.00		
p-values: *p<.05; **p<.01; ***p<.001			

Table 4: Predicted odds ratio of reporting more than one partner in the past year among Zambian females ages 15-49

	OR	P-Value
Marital Status		
Not married	1.44E+07	NS (.98)
Married (Reference)	0	0
Widowed/Divorced	2.86E+07	NS (.1.0)
Union Type		
Polygamous	2.01	NS (.41)
Monogamous (Reference)	0	0
Children Last 2 years		
No children past 2 years	1.098	NS (.95)
Children (Reference)	0	0
Age		
15-19	3.34	NS (.10)
20-29	1.14	NS (.81)
30-39	0	NS (.00)
40-49	1.3	NS (.69)
Wealth Status		
Poorest	1.14	NS (.87)
Poor	2.2	NS (.24)
Average (Reference)	0	NS (.00)
Wealthy	0.38	NS (.27)
Wealthiest	0.8	NS (.81)
Education		
No Education	0.861	NS (.83)
Primary (Reference)	0	0
Secondary Education	0.31	NS (.04)
Trips Away		
1-2	2.07	NS (.12)
3 or more	3.24	*(.04)
Residence		
Co-Residing w/ partner	0	0

(Reference)		
Not Co-Residing	1.56	NS (.65)
Location		
Rural (Reference)	0	0
Urban	2.86	NS (.19)
Decision Making		
Respondent makes some decisions alone	2.57	NS (.48)
Husband makes some decisions only (Reference)	0	0
Respondent and husband make some joint decisions	0.08	* (.026)
Sexual Autonomy		
Respondent cannot refuse sex and demand	0	NS (1.0)
Respondent can refuse sex and demand condom (Reference)	0	0
Respondent believes it is ok to beat wife in some circumstances	1.07	NS (.50)
Respondent believes it is never ok to beat wife (Reference)	0	0
Respondent Employed	1.17	**(.014)
Respondent Not Employed (Reference)	0	0
Type of payment for labor		
Cash or some cash and in kind combination	0.81	NS (.70)
No cash or in kind only (Reference)	0	0
Alcohol at Last Sex		
Either partner consumed alcohol	6.69	***(.000)
Neither partner consumed alcohol (Reference)	0	0
Respondent had first sex before age 15		
No (Reference)	0	0
Yes	1.641	NS (.31)

Knowledge of A,B,C HIV Prevention Methods		
Knowledge of 1-2 methods	1.3	NS (.42)
Knowledge of one or more (Reference)	0	0

Table 5: Predicted odds ratios of reporting more than one partner in the past 2 months among Zimbabwean males

	OR	95% Confidence Interval	p-value
Union type			
Never Married	0.58	0.34-0.99	*
Married, co-residing (reference)	1.00	-	-
Married, not co-residing	1.79	1.124-2.841	*
Widowed/Divorced	1.29	0.74-2.24	n.s.
Polygamous	0.99	0.41-2.38	n.s
Age			
15-19	2.83	1.48-5.40	**
20-29	2.28	1.53-3.17	***
30-39 (Reference)	1.00	-	-
40-49	0.87	0.51-1.50	n.s
Education			
None	0.30	0.03-3.34	n.s
Primary (Reference)	1.00	-	-
Secondary/Higher	1.34	0.93-1.94	n.s
Wealth Index			
Poorest	0.97	0.58-1.64	n.s
Poor	0.96	0.58-1.58	n.s
Middle (Reference)	1.00	-	-
Wealthy	0.79	0.47-1.35	n.s
Wealthiest	0.54	0.29-1.03	n.s
Trips Made			
None (Reference)	1.00	-	-
1 or 2	1.74	1.18-2.57	**
3 or More	2.12	1.51-2.96	***
Defacto Location			
Urban	1.57	0.96-2.56	n.s
Rural (Reference)	1.00	-	-
Paid for Sex within Past 12 Months			
Yes	1.79	1.07-2.98	*
No (Reference)	1.00	-	-
No Kids by 2nd Year of Marriage			
No (Reference)	1.00	-	-
Yes	0.00	.00-	n.s
Okay to Beat Woman in any of 5 Situations			
Yes	1.21	1.09-1.35	***
No (Reference)	1.00	-	-
Respondent Worked in Past 12 Months			
Yes (Reference)	1.00	-	-
No	1.97	1.21-3.20	**
Alcohol at Last Sex			
Yes	3.56	2.63-4.84	***
No (Reference)	1.00	-	-

Sex Before Age of 15			
Yes	1.47	0.84-2.60	n.s
No (Reference)	1.00	-	-
Belief in ABC Model Prevention			
Yes	1.10	0.84-2.60	n.s
No (Reference)	1.00	-	-

Source: Demographic and Health Surveys (DHS) 2005-2006 Zimbabwe Report

*p<0.05, ** p<0.01, *** p<0.001

Table 6: Predicted odds ratios of reporting more than one partner in the past 2 months among Zimbabwean females

		OR		95% Confidence Interval		p-value
Movement						
Frequency of trips away in the last month						
None (reference)		1.00	-			-
1-2 trips		0.67		0.35-1.28		-
3 or more trips		0.46		0.20-1.03		-
Work and finances						
Work status						
Does not work (reference)		1.00	-			-
Unpaid work		1.22		0.42-3.56		-
Works for cash or in kind		0.94		0.51-1.75		-
Wealth index						
Rural Poor		0.64		0.24-1.76		-
Rural Average (reference)		1.00	-			-
Rural Wealthy		1.26		0.49-3.24		-
Urban Poor		3.20		1.28-8.04		*
Urban Average		0.85		0.24-2.98		-
Urban Wealthy		1.01		0.30-3.46		-
Domestic relations						
Husband is justified to beat wife if she refuses sex						
No (reference)		1.00	-			-
Yes		1.15		0.59-2.23		-
Can't refuse sex with husband						
No (reference)		1.00	-			-
Yes		1.58		0.57-4.40		-
Alcohol consumption						
Alcohol consumed in last sex						
No (reference)		1.00	-			-
Yes		5.63		3.16-10.04		***
Controls						
Age						
15-19		2.43		0.93-6.34		-
20-29		1.96		0.91-4.22		-
30-39 (reference)		1.00	-			-
40-49		0.75		0.23-2.41		-
Union type						
Married, co-residing (reference)		1.00	-		-	
Not Married		12.79		4.41-37.12		***
Married, not co-residing		0.54		0.13-2.30		-
Has co-wives		2.60		0.86-7.86		-
Widowed, divorced, or separated		27.04		11.02-66.35		***
Education						
None	1.02		0.23-4.59		-	
Primary (reference)	1.00					

Secondary or higher	0.64		0.33-1.25	-
Had an early first sex				
First sex 15 or older (reference)	1.00			
First sex before age 15	1.64		0.72-3.77	-
Transactional sex				
No (reference)	1.00			
Yes				
Knows fidelity can prevent HIV infection				
No		1.00		
Yes		0.47	0.26-0.85	*
Language				
Shona		1.00	-	-
ndebele or other		.76	0.35-1.64	-

Source: Demographic and Health Surveys (DHS) 2005-2006 Zimbabwe Report

*p<0.05, ** p<0.01, *** p<0.001