Intimate Partner Violence and HIV Risk in Kenya

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Abstract: HIV is a prevalent health problem in Kenya, as an estimated 6.1% of the adult population is currently HIV positive. Intimate partner violence has been associated with increased HIV risk in both women and in men in other settings. Using nationally-representative data from 2003 Kenya Demographic and Health Survey that includes information on both HIV serostatus and intimate partner violence to explore whether there is a correlation between physical, sexual, or emotional violence and HIV in currently married Kenyan men and women. Although I find that men whose wives report emotional abuse are more likely to be HIV positive, this association is otherwise not significant. Rather, among women, HIV infection is significantly associated with being in a polygamous marriage, as well as the number of years of exposure to premarital sexual activity. Among men, being in a polygamous marriage is associated with a higher rate of HIV, while being circumcised is associated with a lower probability of infection. In both genders, being of Luo ethnicity is also often positively associated with HIV infection.

Introduction

HIV in Kenya is a prevalent health problem. Despite recent statistics that indicate that the prevalence of HIV might be falling, the national prevalence of HIV was still 6.1% at the end of 2005 (UNAIDS 2006). The Kenyan Ministry of Health estimates that excess mortality due to AIDS has decreased life expectancy by 20 years to 46 years at birth (Kenya Ministry of Health 2001).

In the early years of the HIV/AIDS pandemic, the majority of HIV positive individuals in Kenya were men. Women now represent an increasing share of new HIV infections worldwide, including in Kenya, where the HIV prevalence rate in 2006 was 8.3% among women aged 15-49, compared to a 4.3% prevalence rate among men aged 15-49 (UNAIDS 2006). UNAIDS identifies pervasive gender inequalities, including imbalances in social, economic, and sexual power, as increasing a woman's risk of contracting HIV or another STI as she may have reduced ability to negotiate when, with whom, and under what conditions she will have sex (UNAIDS 2005). One particular source of gender-based power differentials is the physical, emotional, and sexual violence men perpetrate against women, a phenomenon associated with increased risk of HIV (Maman et. al. 2000, Jewkes et. al. 2003). Other studies have indicated that, for a variety of reasons explained below, men who abuse their sexual partners are also more likely to be HIV positive. Thus, intimate partner violence might be one factor shaping the HIV epidemic in Kenya.

Although the extent of intimate partner violence is hard to measure accurately, a 2002 baseline survey conducted in Nairobi among women aged 22-29 attending antenatal clinics showed that 51% had experienced lifetime abuse of any type from their intimate partners. Although only 5% reported sexual abuse, over half of these reported that it was their husband who had committed sexual abuse. Very few women reported the abuse to the police, and many wives even reported that it was their marital duty to suffer abuse from their husbands (FIDA Kenya 2002).

Previous work on intimate partner violence and HIV risk

Previous empirical work suggests three mechanisms via which partner violence is related to sexual behavior and STI risk in women. Firstly, sexual abuse and rape directly negate a woman's control over her sexual behavior, and the violence associated with assault often increases the biological transmissibility of the virus (van der Straten et. al. 1998). Secondly, even when a woman is not physically forced into behaviors that could lead to infection with a STI or HIV, the threat of partner violence reduces a woman's negotiating power within a relationship (Santelli et.al.1996) Women under the threat of abuse are less likely to negotiate condom use (Jewkes et. al. 2003, Wingood and DiClemente 1997) and less likely to discuss the risks of sexual behavior with their partners (Lasee and Becker 1997).

Finally, the threat of violence also impedes a woman's ability to access information about her partner's disease status and risk behaviors as well as her own disease status, because the threat of violence and abandonment makes this information more costly to obtain. The threat of violence discourages women from asking their husbands about their risky behaviors, including extramarital partners and HIV status, because they fear violent retribution for their doubt and suspicion (Gupta 2002). Women do not get tested for HIV or disclose their status to their partners because of fear of violence or economic abandonment, especially as women are often violently punished when other family members are found to be HIV positive (Turmen 2003).

Previous literature has also shown that men who abuse their intimate partners are also at higher risk of HIV infection (Dunkle et. al. 2006). Explanations for this associated include that men who abuse their intimate partners are more likely to engage in other risky behaviors that can lead to increased HIV and other STI infection, such as abusing drugs (Gielen et. al. 2002), alcohol (Rao 1997), have more sexual partners (Martin et. al. 1999), or are less likely to use condoms (Gielen et. al. 2002). Patriarchal cultural pressures that encourage early sexual initiation and fatherhood are also associated with increased sexually transmitted infection risk (Varga 2003).

Considering the body of literature on the links between intimate partner violence and sexual risk-taking, there is a gap in the literature in terms of large-scale, population-based studies, particularly outside the United States. Many studies focusing on the links between sexual behavior, violence, and HIV risk utilize small samples of men and

women at high risk of HIV or other STIs, such as urban drug users, women using urban antenatal or sexually transmitted infection centers, and sex workers. Other studies focus on links between intimate partner abuse and subsequent sexual behavior in a more representative study population, but these studies have been conducted in Rwanda, South Africa, the United States, and India, not in Kenya. Furthermore, these studies often focus on one type of violence, such as sexual violence, experience of rape, or physical violence. In this study, I am able to examine the influences of three different types of abuse on HIV risk: emotional violence, sexual violence, and physical violence, as well as control for partner characteristics associated with increased risk of HIV transmission and partner violence, such as economic status, male circumcision, marital history, and a partner's sexual behaviors.

Conceptual Framework

Previous work has indicated that physical partner violence has important consequences for the spread of HIV because of its influence on the sexual decision-making process (Johnson and Hellerstadt 2002). Previous authors have applied the Health Belief Model [HBM], a psychosocial model of behavior change, to sexual behavior in light of HIV and other STIs (Maskay and Juhasz 1983; Jurich et. al. 1992), and I believe this model is useful when thinking about sexual behavior, sexual decision-making, intimate partner violence, and HIV risk. The Health Belief Model, briefly, explains that individuals will be motivated to change their sexual behavior in response to HIV risk if they correctly perceive the seriousness of these illnesses and their own risk of contracting these illnesses, identify few barriers to behavior change, and believe they have personal ability to change their behaviors. Previous empirical findings have indicated that intimate partner violence can impede behavior change among men and women at most of these stages, thus leading to a higher risk of HIV infection.

Previous work shows that intimate partner abuse can impair a woman's general capacity to assess risks (Bolger et. al. 1998), either because physical injury can directly harm the brain (Mezey et. al. 2005) or because physical, sexual, and emotional abuse often leads to depression, anxiety, and other mental health conditions (Pico-Alfonso et. al. 2006). Perhaps because of reduced risk assessment capacity, previously abused

women are more likely to engage in sexual and non-sexual risk behavior that may bring short-term benefits at the expense of serious long-term sexual health consequences, such as seeking out additional sexual partners as a source of emotional fulfillment (Luster and Small 1997), or turning to sex work in order to afford money for alcohol and other drugs (Zierler et. al. 1991). Alcohol or drug abuse among men would also decrease their ability to assess the riskiness of their sexual behaviors, such as the decision to use a condom or to employ a sex worker. As noted above, intimate partner violence can also impede a woman's ability to garner information about her specific risk on contracting HIV from her husband, as women facing the threat of further abuse are less likely to question their partners regarding their personal sexual behaviors and HIV status (Maman et. al. 2000).

Intimate violence against women can increase risky sexual behavior and HIV because it presents a barrier to behavior changes that involve partner cooperation, such as condom use, by reducing a woman's negotiating power within intimate relationships (Blanc 2001), which leaves women less likely to negotiate safe sex behaviors even when aware of the risk of HIV and other STIs (Santelli et. al. 1996). The health 'costs' associated with immediate abuse from their partners likely seem especially high relative to the health 'benefit' of protecting oneself against a disease that will kill only after many years. Previous work has also indicated that past experience of intimate partner violence lowers a woman's feelings of control and self-efficacy, even when the threat of abuse is removed, and thus no longer presents an immediate barrier to behavior change (Umberson et. al. 1998; Carlson 1997). This lack of personal efficacy can result in unsafe sexual behavior, even when women have adequate knowledge of the risks of unsafe sex (Hulton et. al. 2000).

Among men, barriers to behavior change include cultural norms that promote a patriarchal view of male sexuality, the social organization of marriage and family as male-dominated, and personal distaste associated with using condoms. While intimate partner violence likely does not prevent men from changing their behavior in the same way that it may constrain women's options, the costs associated with violating cultural norms could keep men from adapting behaviors that would otherwise be beneficial, such as using condoms or reducing their number of sexual partners.

Thus, the Health Belief Model as applied to intimate partner violence and the sexual decision-making process, as well as previous empirical findings, would predict that HIV rates should be elevated both among women who have experienced abuse at the hands of their husbands, as well as among men whose wives report abuse, albeit for different reasons.

Data and Methods

This study utilizes data from the 2003 Kenya Demographic and Health Survey (DHS), a population-based national survey of women aged 15-49 (Kenya Ministry of Health 2004). In addition to a rich array of demographic and economic variables, the survey includes biomarker data from anonymous blood HIV seroprevalence testing, collected from a sub-sample of 50% of the total number of households in the larger Kenya DHS. Men aged 15-54 in the same 50% sub-sample were interviewed as well. In order to control for partner characteristics, marital histories, and sexual behavior, I limit my sample size to women and men for whom their spouse is also surveyed.

Women who reported being married at least once were asked whether their husbands had ever 'humiliated' them [which I use as my measure of emotional violence], whether their husbands had ever forced them to have sexual intercourse against their will, and whether their husbands had ever committed a series of physically violent acts against them. In order to measure the effect of experiences of partner violence, I construct three binary variables, one for each different type of intimate partner abuse: emotional, physical, and sexual. Binary variables for sexual abuse and emotional abuse are coded 1 if an individual reports having ever experienced these types of abuse at the hands of their husbands, 0 otherwise. The binary variable for physical violence is coded 1 if women report having ever been kicked, pushed, slapped, punched, strangled, or attacked with a knife or other weapon by their husbands, 0 otherwise. I use logistic regression of experience of each type of abuse in turn to examine the effect of each type of violence on HIV status independently of the others.

In each regression, I control for a number of personal characteristics of the individual that are likely associated with intimate partner violence, HIV risk, or both. For

both men and women, I control for an individual's own age, ethnicity [currently coded as 1 for Luo ethnicity, 0 otherwise], religion [Christian, Muslim, or Catholic], years of education, employment status, number of years of premarital sexual activity[1], age at first marriage, number of marriages[2], whether in a polygamous union, total children ever born, whether that individual has ever engaged in transactional sex [in exchange for gifts or money], whether that individual has ever discussed HIV risk with his or her spouse, whether the husband of the couple is circumcised, whether the husband drinks alcohol, and whether the woman of the couple is currently pregnant. For women, I also control for whether her first marriage was to a man more than ten years older than she was, as well as for whether it was arranged. As for partner characteristics, I control for a respondent's partner's age, years of education, whether the respondent's partner has ever engaged in transactional sex, the number of years of premarital sexual activity [see footnote 1], age at first marriage, total number of marriages or wives [see footnote 2], and total children ever born. I also include an indicator variable coded 1 if either member of the couple self-reports a STI infection, genital sores, or genital discharge within the last 12 months. I control for household wealth using an index of assets and house quality according to the methods of Filmer and Pritchett (2001), divided into quintiles. Finally, I control for region [Nyanza, Nairobi, and all other regions, reflecting the two regions of the country with the highest HIV prevalence rates (Johnson and Way 2006)] and whether the household is located in an urban area. I also use the included probability sampling weights for the HIV sample. My final analysis sample contains 875 men and 877 women; sample characteristics are listed in Appendix 1.

Results

These results indicate that, when controlling for other factors of a respondent's own personal characteristics, sexual behaviors, economic circumstances, marital and

[1] Please note there is likely measurement error in this variable. I only code individuals as engaging in premarital sexual activity if they report an age at first sex that is younger than the reported age at first marriage. Thus, individuals who engaged in sexual activity prior to marriage, but within the same age year as the marriage, are coded as not engaging in premarital sexual activity.

[2] For women, this variable is only available as having had been either married only once or more than once.

sexual history, as well as a partner's characteristics, personal history, and behaviors, physical intimate partner violence [Table 1] and sexual intimate partner violence [Table 2] are not a significant correlates of HIV risk in this population, for either men or for women. Table 3 indicates that, although emotional violence is not significantly associated with HIV risk among women, men whose wives report being 'humiliated' by their partners are 2.6 times as likely to be HIV positive, a significant association.

Factors that are significantly correlated with increased HIV risk among women in this sample is the number of years these women engaged in premarital sexual activity, as well as whether she is in a polygamous marriage and from the Luo ethnic group. Tables 1, 2, and 3 indicate that women in polygamous marriages are anywhere from 3.0-3.3 times as likely to be HIV positive. Tables 1, 2, and 3 also indicate that each additional year of premarital sexual activity increases the odds of being HIV-positive by 1.2. A woman is significantly less likely to be HIV positive if she is also currently pregnant, perhaps because it is more difficult to get pregnant if one is HIV positive (Nguyen et. al. 2006).

Among men, Tables 1, 2, and 3 indicate that being in a polygamous marriage is associated with a 3.4-3.6 increase in the odds of being HIV positive. Being of the Luo ethnic group is also associated with an elevated risk of HIV. Tables 1, 2, and 3 also indicate the strong negative associated between male circumcision and HIV risk among males, as males who have been circumcised are between 0.2 and 0.3 times as likely to be HIV positive as males who have not been circumcised.

Discussion

These results indicate that women who have been abused emotionally, physically, or sexually by their husbands are not significantly more likely to be HIV positive than women who have not been abused by their partners. These findings somewhat contradict previous empirical research that shows a clear positive correlation between HIV and intimate partner violence. One possible explanation for this finding is that it could be that married women have little choice regarding their sexual behaviors, regardless of abuse experience. De Walque (2006), for instance, finds that condom use is very low among married couples. Or, an alternate explanation is that, in the Kenyan context, other factors

such as premarital sexual experience simply matter more for HIV risk than partner violence. Among men, those whose wives report that they have been abused sexually or physically by the respondent are no more likely to be HIV positive than husbands whose wives do not indicate abuse. Having a wife who reports emotional violence, however, is a significant positive predictor of HIV infection in this sample.

The institution of polygamous marriage, in this survey of married couples, is associated with higher HIV infection among both women and men. This finding is not surprising; a polygamous marriage introduces both the male and the female members of the household to concurrent sexual partnerships even when no members of the household are engaging in extramarital relationships. Morris and Kretzschmar (1997) indicate that concurrent partnerships are highly conducive to the transmission of HIV among a population, much more so than sequential monogamous sexual partnerships. This finding could be due to the fact that HIV transmission rates decline within a few weeks following initial infection due to lowered viral load, until an individual again experiences a high viral load as he or she progresses to AIDS (Coutinho et. al. 2001).

These results indicate that premarital sexual activity is a stronger correlate of HIV infection among women than is an abusive marital relationship, although it is impossible to know from the DHS whether these premarital relationships were also marked by sexual coercion or violence. It is quite possible that intimate partner violence plays an important role in the transmission of HIV to women during her premarital, sexually active years. As Luke (2003) points out, premarital sexual relationships in Kenya, especially those between younger girls and older men, are often marked by economic inequalities and intimate partner violence, and often lead to higher rates of HIV infection, even when girls choose to begin and stay in these relationships. Furthermore, young women in these relationships often find themselves unable to engage in HIV protective strategies due to economic and age-based power differentials (Longfield et. al. 2004). It is also likely that at least some of these early sexual experiences were forced; the rate of sexual assault in Kenya is quite high, and women in the survey report ages of sexual debut as young as eight. Thus, even though marital intimate partner violence is not correlated with HIV risk among married men and women in this survey, this conclusion

does not discount the possibility that intimate partner violence could be associated with HIV risk in other relationship contexts in Kenya.

Among men, male circumcision was a strong negative predictor of HIV risk, a result that supports findings from recent randomized trials of circumcision (Bailey et. al. 2007; Gray et. al. 2007). These findings suggest that male circumcision could be a powerful tool in the fight against HIV transmission, one that does not depend on repeated partner cooperation or long-term behavior change. It should be noted, however, that these results indicate that women whose husbands are circumcised are equally likely to be HIV positive as women whose husbands are not circumcised, indicating that male circumcision may protect males more than females. This result should be explored further using a sample of women whose only lifetime sexual partner was their husband.

These results certainly should not be taken to suggest that intimate partner violence among married couples is not a legitimate health concern in its own right, as it is associated with myriad other physical and mental health problems among women. Rather, these results indicate that, in terms of HIV correlates in Kenya among married couples, other factors seem to matter more, apart from emotional violence and HIV risk among males. Thus, focusing on reducing intimate partner violence among married couples as a barrier to HIV prevention might not be the most effective approach, as it is not marital partner violence itself that seems to be correlated with HIV risk among men and women, but rather other sexual behaviors and marital customs, such as premarital sexual activity and polygamous marriage, that have a stronger association with HIV risk, particularly in an environment where other protective behaviors, such as using condoms, are very rarely employed among married women even when they are not facing the threat of partner abuse (de Walque 2006).

Data Limitations

These data suffer from a number of potential reporting biases and other limitations. Recall bias refers to reporting bias that might arise when respondents recall more recent events more accurately than events further in the past. Because women are reporting on lifetime intimate partner violence incidence, women might be more prone to remember and report on more recent events, rather than incidents that occurred many

years ago. In addition to recall bias, abusive events are often under-reported because individuals feel ashamed, want to forget the event, or psychologically repress the memory of a traumatic experience (Ellsberg et. al. 2001). If Kenyan women under-report violent events differentially based on their own or their husband's HIV status, this differential reporting could lead to biased conclusions. It is impossible to know whether either of these types of bias are occurring with these data, but should be kept in mind when interpreting the results.

While this study includes relatively few self-reported sexual behavior variables, focusing instead mainly on marital histories, it does include self-reports of the age of sexual debut. In addition to being subject to recall bias, these ages of sexual debut could either be prone to upwards or downwards revision, depending on an individual's gender, cultural beliefs regarding premarital sexual activity, or perhaps depending on whether one chose the timing of sexual debut, or whether an individual's first sexual experience was coerced or forced. However, I think it is unlikely that women in this sample are downwardly revising their ages at sexual debut, which would upwardly bias the coefficient on female premarital sexual experience.

Finally, all data presented in this study are cross-sectional only, and thus the associations presented here are correlational only, not causal.

References

Bailey R C, Moses S, Parker C B, Agot K, Maclean I, Krieger J N, Williams C F, Campbell R T, and Ndinya-Achola J O (2007). "Male circumcision for HIV prevention in young men in Kisumu, Kenya: A randomized controlled trial." *The Lancet* 369(9562):617-619.

Blanc A (2001). "The effect of power in sexual relationships on sexual and reproductive health: An examination of the evidence." *Studies in Family Planning* 32(3): 189-213.

Bolger K, Patterson C, and Kupersmidt J (1998). "Peer relationships and self-esteem among children who have been maltreated." *Child Development* 69(4): 1171-1197.

Carlson B (1997). "A stress and coping approach to intervention with abused women." *Family Relations* 46(3): 291-298.

Coutinho F A, Lopex L F, Burattini M N, and Massad E (2001). "Modelling the natural history of HIV infection in individuals and its epidemiological implications." *Bulletin of Mathematical Biology* 63(6): 1041-1062.

De Walque D (2006) "Who gets AIDS and how? Determinants of HIV infection and sexual behaviors in Burkina Faso, Cameroon, Ghana, Kenya, and Tanzania." *World Bank Working Paper #WPS 3844*. Washington DC: World Bank.

Dunkle K L, Jewkes R K, Nduna M, Levin J, Jama N, Khuzwayo N, Koss M P, and Duvvury N (2006). "Perpetration of partner violence and HIV risk behavior among young men in the rural Eastern Cape, South Africa." *AIDS* 20(16): 2107-2114.

Ellsberg M, Heise L, Pena R, Agurto S, and Winkvist A (2001). "Researching domestic violence against women: Methodological and ethnical considerations." *Studies in Family Planning* 32(1): 1-16.

FIDA Kenya (2002). *Domestic Violence in Kenya: Report of a Baseline Survey Among Women in Nairobi*. Nairobi: FIDA Kenya.

Filmer D and Pritchett L (2001). "Estimating wealth effects without expenditure data—or tears." *Demography* 38(1):115-132.

Gielen A C, McDonnell K A, and O'Campo P J (2002). "Intimate partner violence, HIV status, and sexual risk reduction." *AIDS and Behavior* 6(2): 107-116.

Gray R H, Kigozi G, Serwadda D, Makumbi F, Watya S, Malugoda F, Kiwanuka N, Moulton L H, Chaudhury M A, Chen M Z, Sewankambo N K, Wabwire-Mangen F, Bacon M C, Williams C F, Opendi P, Reynolds S J, Laeyendecker O, Quinn T C, and Wawer M J (2007). "Male circumcision for HIV prevention in men in Rakai, Uganda: A randomized trial." *The Lancet* 369(9562): 617-619.

Gupta G R (2002). "How men's power over women fuels the HIV epidemic: It limits womens' ability to control sexual interactions." *British Medical Journal* 26(324): 183-184.

Hulton L, Cullen R, and Wamala Khalokho S (2000). "Perceptions of the risks of sexual activity and their consequences among Ugandan adolescents." *Studies in Family Planning* 31(1): 35-46.

Jewkes R, Levin J B, and Penn-Kakana L (2003). "Gender inequalities, intimate partner violence, and HIV preventative practices: findings of a South African cross-sectional study." *Social Science and Medicine* 56(1): 125-134.

Johnson P and Hellerstadt W (2002). "Current or past physical or sexual abuse as a risk marker for sexually transmitted disease in pregnant women." *Perspectives on Sexual and Reproductive Health* 34(2):62-67.

Johnson K and Way A (2006). "Risk factors for HIV infection in a national adult population: Evidence from the 2003 Kenya Demographic and Health Survey." *Journal of the Acquired Immune Deficiency Syndrome* 42: 627-636.

Jurich J, Adams R, and Schulenberg J E (1992). "Factors related to behavior change in response to AIDS." *Family Relations* 41(1):97-103.

Kenya Ministry of Health (2001). *AIDS in Kenya*. Nairobi: Kenyan Ministry of Health.

Kenya Ministry of Health and ORC Macro (2004). *Kenya 2003 Final Report*. Calverton, MD: ORC Macro.

Lasee A and Becker S (1997). "Husband-wife communication about family planning and contraceptive use in Kenya." *International Family Planning Perspectives* 23(1): 15-20 and 33.

Longfield K, Glick A, Waithaka M, and Berman J (2004). "Relationships between older men and younger women: Implications for STIs/HIV in Kenya." *Studies in Family* Planning 35(2): 125-134.

Luster T and Small S (1997). "Sexual abuse history and number of sex partners among female adolescents." *Family Planning Perspectives* 29(5): 204-211.

Maman S, Campbell J, Sweat M D, and Gielen A C (2000). "The interactions of HIV and violence: Directions for future research and interventions." *Social Science and Medicine* 50(1): 459-478.

Martin S L, Kilgallen B, Tsui A O, Maitra K, Singh K K, and Kupper L L (1999). "Sexual behaviors and reproductive health outcomes: associations with wife abuse in India." *Journal of the American Medical Association* 282: 1967-72.

Maskay M and Juhasz A (1983). "The decision-making process model: Design and use for adolescent sexual decisions." *Family Relations* 32(1):111-116.

Mezey G, Bacchus L, Bewley S, and White S (2005). "Domestic violence, lifetime trauma, and psychological health of childbearing women." *BGOJ: An International Journal of Obstetrics and Gynecology* 112(2): 197-204.

Morris M and Kretzschmar M (1997). "Concurrent partnerships and the spread of HIV." *AIDS* 11(5): 641-648

Nguyen R H, Gange S J, Wabwire-Mangen F, Sewankambo N K, Serwadda D, Wawer M J, Quinn T C, and Gray R H (2006). "Reduced fertility among HIV-infected women associated with viral load in Rakai district, Uganda." *International Journal of STDs and AIDS* 17(12): 842-46.

Pico-Alfonso M, Garcia-Linares M, Celda-Navarro N, Blasco-Ros C, Echeburea E, and Martinex M (2006). "The impact of physical, psychological, and sexual intimate male partner violence on women's mental health: Depressive symptoms, posttraumatic stress disorder, state anxiety, and suicide." *Journal of Women's Health* 15(5):599-611.

Rao V (1997). "Wife-beating in rural south India: a qualitative and econometric analysis." *Social Science and Medicine* 44(8): 1169-1180.

Santelli J S, Kouzis A C, Hoover D R, Polacsek M, Burwell L G, and Celentano D D (1996). "Stages of behavior change for condom use: The influence of partner type, relationship, and pregnancy factors." *Family Planning Perspectives* 28(3): 101-107.

Turmen T (2003). "Gender and HIV/AIDS." *International Journal of Gynecology and Obstetrics* 82: 411-418.

Umberson D, Anderson K, Glick J, and Shapiro A (1998). "Domestic violence, personal control, and gender." *Journal of Marriage and the Family* 60(2): 442-452.

UNAIDS (2005). "Violence against women and HIV/AIDS: Critical intersections. *Information Bulletin Series* Number 1

UNAIDS (2006). http://www.unaids.org/en/Regions_Countries/Countries/kenya.asp Accessed September 21, 2006.

Van der Straten A, King R, Grinstead O, Vittinghoff E, Serufilira A, and Allen S (1998). "Sexual coercion, physical violence and HIV infection among women in steady relationships in Kigali, Rwanda." *AIDS and Behavior* 2(1): 61-73.

Varga C A (2003). "How gender roles influence sexual and reproductive health among South African adolescents." *Studies in Family Planning* 34(3): 160-172.

Wingood G M and Diclemente R J (1997). "The effects of an abusive primary partner on condom use and sexual negotiation practices of African-American women." *American Journal of Public Health* 87(6): 1016-1018.

Zierler, S., Lisa Feingold, Deborah Laufer, Priscilla Velentgas, Ira Kantrowitz-Gordon, and Kenneth Mayer. 1991. "Adult survivors of childhood sexual abuse and subsequent risk of HIV infection." *American Journal of Public Health* 81(5): 572-575.

Table 1: The Effect of Physical Intimate Partner Violence on HIV Risk [adjusted odds ratios]

Variable	Males	p-value	Females	p-value
respondent characteristics				
wife reports ever experiencing physical partner violence from husband	0.8		0.5	
current age [years]	1.0		0.9	
education [years]	1.0		1.0	
Luo ethnicity	3.4	+	3.9	+
Catholic	0.8		0.6	
Muslim	1.5		0.8	
[Christian/other is reference]				
currently employed	1.1		0.6	
premarital sexual activity [years]	1.1		1.2	*
age at first marriage [years]	0.9		0.9	
number of marriages[1]	0.9		2.1	
first marriage arranged	n/a		0.6	
first marriage to a man more than 10 years older	n/a		0.5	
children ever born	0.8	+	1.1	
has talked to partner about HIV	1.8		1.0	
ever engaged in transactional sex	1.6		0.7	
household/couple characteristics				
urban area	1.1		0.7	
Nairobi	2.0		2.6	
Nyanza	1.9		1.6	
wife is pregnant	0.4		0.1	**
husband is circumcised	0.3	*	0.6	
husband drinks alcohol or uses illegal drugs	1.8		2.0	+
polygamous	3.6	+	3.3	*
partner characteristics				
partner's age [years]	1.0		1.1	
partner's education [years]	0.9		1.0	
partner currently employed	0.6		0.9	
partner's premarital sexual activity [years]	1.0		1.0	
partner's age at first marriage	1.1		0.9	
partner's total number of marriages[1]	1.7		1.3	
partner's total children ever born	1.2		0.8	
Either partner reports STI in the past 12 months	1.5		1.4	
partner has ever engaged in transactional sex	2.5		0.9	
N	875		877	

1. this variable is a number for men, a binary variable indicating 'once' or 'more than once' for women

p-values: + indicates p < .1, * p < .05, ** p < .01, *** p <.001

Table 2: The Effect of Sexual Intimate Partner Violence on HIV Risk [adjusted odds ratios]

Variable	Males	p-value	Females	p-value
respondent characteristics				
wife reports husband ever forced her to have sex	1.5		0.5	
current age [years]	1.0		0.9	
education [years]	1.0		1.0	
Luo ethnicity	3.2	+	4.3	*
Catholic	0.8		0.6	
Muslim	1.6		1.0	
[Christian/other is reference]				
currently employed	1.1		0.6	
premarital sexual activity [years]	1.1		1.2	*
age at first marriage [years]	0.9		0.9	
number of marriages[1]	0.8		2.1	
first marriage arranged	n/a		0.6	
first marriage to a man more than 10 years older	n/a		0.6	
children ever born	0.9		1.0	
has talked to partner about HIV	1.7		1.1	
ever engaged in transactional sex	1.5		0.7	
household/couple characteristics				
urban area	1.2		0.7	
Nairobi	1.9		2.8	+
Nyanza	1.8		1.4	
wife is pregnant	0.4		0.1	**
husband is circumcised	0.3	*	0.6	
husband drinks alcohol or uses illegal drugs	1.6		1.9	+
polygamous	3.4	+	3.0	+
partner characteristics				
partner's age [years]	1.0		1.1	
partner's education [years]	0.9		1.0	
partner currently employed	0.6		1.1	
partner's premarital sexual activity [years]	1.0		1.1	
partner's age at first marriage	1.1		0.9	
partner's total number of marriages[1]	1.7		1.3	
partner's total children ever born	1.1		0.8	
Either partner reports STI in the past 12 months	1.4		1.4	
partner has ever engaged in transactional sex	2.7		0.9	
N	876		877	

1. this variable is a number for men, a binary variable indicating 'once' or 'more than once' for women

p-values: + indicates p < .1, * p < .05, ** p < .01, *** p <.001

Table 3: The Effect of Emotional Intimate Partner Violence on HIV Risk [adjusted odds ratios]

Variable	Males	p-value	Females	p-value
respondent characteristics				
wife reports husband has ever 'humiliated' her	2.6	*	1.1	
current age [years]	1.0		0.9	
education [years]	1.0		1.0	
Luo ethnicity	3.3	+	3.9	+
Catholic	0.8		0.6	
Muslim	1.8		1.0	
[Christian/other is reference]				
currently employed	1.5		0.6	
premarital sexual activity [years]	1.0		1.2	*
age at first marriage [years]	1.0		0.9	
number of marriages[1]	0.8		2.0	
first marriage arranged	n/a		0.6	
first marriage to a man more than 10 years older	n/a		0.6	
children ever born	0.9		1.0	
has talked to partner about HIV	1.6		1.1	
ever engaged in transactional sex	1.5		0.8	
household/couple characteristics				
urban area	1.2		0.7	
Nairobi	1.7		2.5	
Nyanza	2.0	+	1.4	
wife is pregnant	0.4		0.1	**
husband is circumcised	0.2	*	0.5	
husband drinks alcohol or uses illegal drugs	1.6		1.7	
polygamous	3.5	*	3.0	+
partner characteristics				
partner's age [years]	1.0		1.1	
partner's education [years]	0.9		1.0	
partner currently employed	0.6		1.0	
partner's premarital sexual activity [years]	1.0		1.0	
partner's age at first marriage	1.1		0.9	
partner's total number of marriages[1]	1.5		1.2	
partner's total children ever born	1.1		0.8	
Either partner reports STI in the past 12 months	1.4		1.4	
partner has ever engaged in transactional sex	2.3		0.9	
N	876		877	

1. this variable is a number for men, a binary variable indicating 'once' or 'more than once' for women

p-values: + indicates p < .1, * p < .05, ** p < .01, *** p <.001

Appendix A: Sample Summary Statistics		
Variable	**Male Sample**	**Female Sample**
respondent characteristics		
% HIV positive	7.0	8.7
% wife reports ever experiencing physical partner violence from husband	39.5	40.8
% wife reports husband ever forced her to have sex	13.7	14.0
% wife reports ever being 'humiliated' by husband	15.9	16.0
current age [years]	35.8	29.3
education [years]	8.0	6.9
% Luo ethnicity	13.0	12.8
% Christian or other religion	66.8	71.0
% Muslim	6.6	6.4
% Catholic	26.7	22.6
% currently employed	94.5	66.2
premarital sexual activity [years]	7.1	2.2
age at first marriage [years]	23.9	18.9
number of marriages[1]	1.3	7.1
% first marriage arranged	n/a	12.9
% first marriage to a man more than 10 years older	n/a	18.8
children ever born	4.3	3.5
% has talked to partner about HIV	86.1	67.4
% ever engaged in transactional sex	18.6	1.1
household/couple characteristics		
% urban area	19.8	19.2
% Nairobi	7.9	7.5
% Nyanza	15.8	16.1
% other region	76.3	76.4
% wife is pregnant	14.4	14.8
% husband is circumcised	86.3	85.7
% husband drinks alcohol or abuses drugs	35.7	35.9
% polygamous	12.0	11.5
partner characteristics		
partner's age [years]	29.4	35.6
partner's education [years]	6.8	8.1
% partner currently employed	65.5	94.5
partner's premarital sexual activity [years]	2.1	7.0
partner's age at first marriage	18.9	23.9
partner's total number of marriages[1]		1.3
partner's total children ever born	3.5	4.2
% partner has ever engaged in transactional sex	1.2	18.6
N	875	877