

# Multiple Sexual Partnerships Among Poor Urban Dwellers in Kampala, Uganda

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**Background:** This study examined 2 issues of current importance for AIDS prevention in Uganda: the frequency of multiple sexual partnerships and whether optimistic perceptions about the severity of AIDS are associated with riskier sexual behavior.

**Methods:** Four hundred five men and women aged 20–39 from 2 poor neighborhoods of Kampala were interviewed about their sexual behavior over the prior 6 months and about other partners during current relationships. They also completed a 7-item scale measuring perception of the severity of HIV/AIDS.

**Results:** About 21.2% of men and 2.9% of women reported ongoing concurrent partnerships; 28.8% and 6.8% reported more than 1 partner in the past 6 months. About 22.2% of men and 32.4% of women believed their partner had had other partners during the relationship. Overall, 56.1% of men and 57.0% of women reported potentially being involved in a multiple or concurrent partnership. Respondents rating AIDS as more severe were more likely to be monogamous.

**Conclusions:** Multiple sexual partnerships may be more common in Uganda than generally supposed, and optimism about the severity of AIDS is associated with having multiple partners. These findings have important implications for HIV/AIDS epidemiology and prevention.

**Key Words:** AIDS severity, HIV, multiple sexual partnerships, prevention, Uganda

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## INTRODUCTION

The course of the AIDS epidemic in Uganda has captured international attention. Uganda was one of the first countries to experience a generalized HIV epidemic with widespread heterosexual transmission. It was also one of the first countries to be successful in substantially reducing HIV incidence and prevalence,<sup>1,2</sup> although prevalence has now stagnated at about 7% of the adult population.<sup>3</sup> More recently, Uganda has been a leader in rolling out antiretroviral treatment in Africa. Insofar as the AIDS epidemic in Uganda has tended to presage events in other African countries, lessons learned from current experience in Uganda are likely to be useful both in Uganda and elsewhere.

A substantial decrease in the proportion of Ugandans engaging in multiple sexual partnerships seems to have been a major factor responsible for the declines in HIV rates in the 1990s, and failure to sustain this decrease in multiple partnerships may explain why HIV rates are now flat or increasing.<sup>2,4,5</sup> Recently, a “Modes of Transmission” modeling exercise alleged that transmission within stable heterosexual couples is the largest contributor to new HIV infections, and this assumption has strongly influenced prevention strategies as reflected in Uganda’s latest National Strategic Plan.<sup>5</sup> The results of such modeling exercises are highly dependent on the data used to generate the model, and these data often are not well known. One key parameter is the frequency of multiple sexual partnerships. Like other countries, Uganda used data from their most recent Demographic and Health Survey (DHS), which suggested very low rates of multiple partnerships in the past 12 months, especially for women (1.8% among women aged 15–49).<sup>6,7</sup> DHS data have been criticized for underestimating the frequency of multiple partnerships, but the extent of this bias is unknown. If rates of multiple partnerships were substantially higher than those reported in DHS, transmission through these partnerships would also be much higher than estimated, and the proportion of transmission occurring within stable heterosexual couples would be correspondingly much lower than estimated by modelers.

Another area of controversy has been the impact of the availability of antiretroviral treatment on prevention of HIV transmission. On the one hand, treatment might aid prevention by lowering infected people’s viral loads and providing an opportunity to coach them on avoiding transmission to others.<sup>8</sup> On the other hand, our qualitative research in Uganda has suggested that availability of treatment has caused people to fear AIDS less than they did in the past and that this might

have a disinhibiting effect on behavior that could increase transmission.<sup>9</sup> Similar behavioral disinhibition caused by optimism about the effectiveness of treatment has been reported elsewhere,<sup>10–13</sup> but few studies have examined this phenomenon in Africa as treatment becomes available. We undertook this study in Uganda to examine these issues of current relevance with the hope of contributing useful information to AIDS prevention efforts in that country and other countries with similar epidemics. We conducted the study among poor urban dwellers because multiple sexual partnerships seem to be more common in urban areas and because most Ugandans (both urban and rural) are poor.<sup>6,7</sup>

## METHODS

This was a random sample door-to-door household interview survey conducted in early 2009 in 2 poor peri-urban communities on the outskirts of Uganda's largest and capital city, Kampala. Interviews were conducted by 5 trained social scientists, all of whom had extensive experience with community-based research and interviews involving sensitive information. Adults aged 20–39 (the age group with the highest HIV incidence in Uganda) were eligible. Stratified sampling was applied, with random sampling within each stratum, based upon a goal of recruiting equal numbers of men and women, of respondents ages 20–29 and 30–39, and of residents in each of the 2 communities. The person answering the door was asked to enumerate all household residents, and a respondent was selected by the interviewer based on the sampling scheme, with return visits when necessary.

This was an anonymous study in that no personal identifiers were collected. Respondents were recruited in their homes and interviewed in a private setting of their choice. The study was approved by ethical review boards of the Harvard School of Public Health and the Uganda National Council for Science and Technology. The study also received informal approval from local community leaders. Respondents were given a consent form written in both English and the local language informing them of risks and benefits; this was read to respondents who were illiterate. Signed consent forms were separated from responses to preserve anonymity. There was no payment for participation, and there were no refusals.

Respondents completed a roughly 15-minute interview that included demographics, perceptions regarding HIV/AIDS, and detailed information regarding their sexual activity during the prior 6 months. Sexual behavior questions were intended to measure various types of multiple partnerships. All questions were asked in wording that would apply to anyone with whom the respondent had sex, regardless of the type of relationship. In addition to their own current behavior, respondents were asked if they had had another sexual partner at any time during their current partnership(s) and if they believed that their partner(s) had other partners at any time during their current relationship, with options for “Yes,” “No,” and “Don't know/not sure.” No time limit was placed on these questions, so that other partnerships may have occurred, in some cases, many years earlier.

We assessed perceived severity of AIDS using a 7-item scale based on one used previously in Brazil.<sup>10</sup> Respondents

rated their agreement with 7 statements about AIDS severity, quality of life, and availability of treatment on a 1–5 scale (fully agree to fully disagree.) Examples of items included “People with HIV/AIDS lead a normal life,” “Treatment for HIV/AIDS is available to everyone,” and “AIDS is not as bad as it used to be.” Responses were averaged to create a severity score, with 5 representing the most severe perception of AIDS.

Consistent condom use among those who were sexually active was assessed in 2 ways, which agreed in all but 2 cases. One was to ask respondents if they always used condoms in the past 6 months with the current partner and up to 4 previous sexual partners. The other was to ask the number of times they had sex in the past 6 months with each sexual partner and then to ask how many of those times they used condoms. Condom use was counted as consistent when it was reported as such by both definitions with all partners.

Data were recorded on paper forms, double entered, and subsequently analyzed using Stata version 11.<sup>14</sup> Associations between the AIDS severity score (as a continuous predictor variable) and sexual risk behaviors (as dichotomous outcomes) were examined using multiple logistic regression, adjusting for age and sex, with resulting odds ratios representing differences in risk related to a 1-point difference in the severity score.

## RESULTS

Table 1 shows characteristics of the study participants. The sample consisted of 198 men and 207 women, mean age 29.1 years, evenly divided between the 2 communities. As would be expected for residents of these poor neighborhoods, educational levels were generally low and most respondents worked in unskilled jobs. During the prior 6 months, 88.4% of men and 87.4% of women reported being sexually active. Among those who were sexually active, 26.4% of men and 18.8% of women reported always using a condom.

As shown in Table 2, the prevalence of multiple sexual partnerships varied greatly depending on the definition used. The most restrictive definition was point prevalence of concurrent partnerships: having, at the time of the interview, 2 or more current partners with whom the respondent expected to continue having sex in the future. This was reported by

**TABLE 1.** Characteristics of Study Subjects (Percentages)

	Men (n = 198)	Women (n = 207)
Age		
20–29	50.5	48.8
30–39	49.5	50.2
Education		
Primary or less	30.3	34.8
Some secondary	30.8	45.9
Completed secondary	11.6	4.8
Above secondary	27.3	14.5
Marital status		
Never married	44.4	17.9
Married	43.4	63.8
Separated, divorced, or widowed	10.6	16.4
Cohabiting but unmarried	1.5	1.9

**TABLE 2.** Prevalence of Reported Multiple Sexual Partnerships of Various Types in Poor Neighborhoods of Kampala, Uganda, 2009

Type of Multiple Partnership	Men, n = 198	Women, n = 207
Ongoing concurrent partnerships at time of survey	21.2%	2.9%
Same, but including “don’t know” if partnership is ongoing	23.2%	3.9%
More than 1 sexual partner in past 6 months	28.8%	6.8%
Another partner during current relationship	30.3%	8.2%
Partner had other partners during current relationship	22.2%	32.4%
Same, but including “don’t know”	52.0%	56.5%
Answered yes to any of the above	35.9%	33.8%
Same, but including “don’t know” answers	56.1%	57.0%

21.2% of men and 2.9% of women. These percentages increased slightly to 23.2% and 3.9% when those who responded “don’t know/not sure” about future sex with 1 or more of the partners were included.

For the type of multiple partnership closest to what was reported by DHS, 28.8% of men and 6.8% of women reported having had more than 1 sexual partner in the past 6 months. A slightly higher percentage reported having had another partner at any time during a current relationship. When asked if their partner had had other partners during a current relationship, 22.2% of men and 32.4% women answered “yes,” whereas an additional 29.8% and 24.1%, respectively, answered “don’t know/not sure.” For our most inclusive definition of multiple partnerships, 56.1% of men and 57.0% of women answered “yes” or “don’t know” to any of the questions that measured multiple partnerships.

We also examined respondents’ rating of the severity of HIV/AIDS and whether this was associated with the “ABC” behaviors promoted for AIDS prevention. Average severity score was 3.03 for men and 2.86 for women on a 1–5 scale (5 most severe; standard deviation = 0.65;  $P = 0.02$  for difference between sexes). Older women rated AIDS as less severe ( $P = 0.04$ ) with no age difference among men. How a respondent rated the severity of AIDS was not associated with his or her practice of Abstinence in the past 6 months or consistent Condom use, but Being faithful (reporting exactly one partner in past 6 months; 70% of sample overall) was more common among respondents who rated AIDS as more severe (odds ratio = 1.46 for each severity score point;  $P = 0.04$ .) In other words, those who considered AIDS to be less severe were less likely to stick to a single partner.

## DISCUSSION

These results suggest that many urban Ugandans may be included in one way or another in networks of multiple and concurrent sexual partnerships. Although the proportion reporting definite ongoing concurrent partnerships at the moment of the interview may seem modest, especially for women, this rose to a more substantial 30.3% of men and 8.2% women who reported having had another partner at some time during a current relationship. As in almost all studies of sexual

behavior, more men than women reported having multiple partners, but this was counterbalanced by the fact that women reported that their partners were more likely to have other partners. A sizable proportion of both men and women reported that a current partner had had other partners during the relationship, with an additional similar proportion reporting that they were “not sure.” By the most inclusive definition, more than half of both men and women were potentially involved in multiple partnerships.

Several factors should be borne in mind when comparing our results with those of the 2006 Uganda DHS or the Uganda HIV/AIDS Sero-Behavioural Survey of 2004–2005, which used methods similar to those of DHS.<sup>6,7,15</sup> These were both large nationally representative samples. Of the types of multiple partnerships that we measured, the only one for which the larger surveys report similar information is having more than 1 sexual partner in past 6 months. Even here, questions were not asked in exactly the same way nor did they refer to the same period (the prior 6 months for the present study vs. 12 months for both DHS and the HIV/AIDS Sero-Behavioural Survey). Furthermore, neither large survey reported data specific to urban dwellers aged 20–39, who were the subjects of the present study. Among all Ugandan women (urban and rural) aged 20–39, the percentage reporting more than 1 partner in the past 12 months was 2.0% in DHS and 2.9% in the HIV/AIDS Sero-Behavioural Survey. Results for urban women were only reported for the wider 15–49 age group, and the corresponding percentages were 2.2% and 3.9%. All of these percentages are substantially lower than the 6.8% rate of multiple partners in the past 6 months observed in the present study.

Because having multiple partners is a stigmatized behavior for Ugandan women, they have little or no incentive to over-report this behavior. It is therefore less of a question of determining whether our results or those of DHS and other large studies are “right” than a question of which survey did a better job of minimizing under-reporting. In this regard, DHS’s national scope, large sample size, and extensive list of questions are all disadvantages compared with our study. We were able to do advance preparation to build trust in the 2 communities that we subsequently surveyed, used only highly experienced interviewers who paid meticulous attention to privacy, and kept our interview short to reduce fatigue. DHS, on the other hand, employs large numbers of interviewers working in multiple locations to ask questions about sexual behavior near the end of a very long interview as a grafted-on addition to a study methodology that was never designed to elicit such sensitive information.

In fact, under-reporting of multiple partners by women may persist in our study, even if at a lower level than in DHS. Of the men in our study, 30.3% reported having had another sexual partner during a current relationship, whereas 32.4% of women reported that their male partner had had another partner. These numbers are in remarkable agreement. On the other hand, only 8.2% of women reported having had another sexual partner during a current relationship, whereas 22.2% of men reported that their female partner had had another partner. The men and women interviewed in our study were not necessarily each other’s partners, but this discrepancy suggests

either that women may have underreported additional sexual partners or that many men may incorrectly believe that their female partners have been unfaithful.

Under-reporting of multiple partnerships is important, especially insofar as prevention activities may be misguided by false numbers. If epidemiologic models estimating modes of transmission systematically use numbers for rates of multiple partnerships that are too low, they will systematically overestimate the proportion of infection taking place within stable heterosexual couples. Such modeling exercises have yielded estimates that up to 70% of infections take place within stable heterosexual couples in some African countries, and these numbers have been widely publicized by international organizations.<sup>16</sup> This could result in an over-emphasis on HIV testing to identify discordant couples and condom promotion for such couples with insufficient emphasis on general efforts to reduce multiple partnerships and thereby break up the interlocking networks of concurrent sexual partnerships that are necessary to sustain a generalized heterosexual epidemic.<sup>17</sup> Perhaps it should be no surprise that the DHS report of 1.8% of Ugandan women aged 15–49 having multiple partners is an underestimate because such a low level seems incompatible with Uganda's persistent HIV prevalence of 7% in the general adult population.

Our results regarding perceptions about the severity of HIV/AIDS in Uganda in 2009 are also of interest. First, it is noteworthy that average ratings of severity were near the midpoint of our scale for what remains an incurable and fatal disease that is by far the main killer of young adults in Uganda in the age group of our respondents.<sup>18</sup> In our opinion, less optimistic ratings might have been more realistic. Second, we found at least some evidence of the potential for the type of behavioral disinhibition caused by treatment that has been observed elsewhere in the world<sup>10–13</sup> in that those who rated HIV/AIDS as less severe were less likely to be faithful to a single partner. These quantitative results are consistent with our findings from focus group discussions suggesting behavioral disinhibition caused by the availability of AIDS treatment in Uganda<sup>9</sup> and argue for the need to further study this phenomenon in Africa.

This study has limitations, and the results should be interpreted with caution. Although we believe it was a well-conducted study, it is a relatively small one representing only 1 segment of the Ugandan population. The face-to-face nature of the interviews may have made it impossible to completely eliminate social desirability bias, despite having only experienced interviewers. Because it was a cross-sectional study, it does not tell us anything about how changes in the frequency of multiple partners may have affected Uganda's changing HIV prevalence rate over time. Most importantly, it is based entirely on self-reported behavior that cannot be verified and, for some questions about partners' behavior, could be inaccurate. But many people are probably right about their partner's behavior because believing that one's

partner has other partners is a strong risk factor for HIV seroconversion among African women.<sup>19</sup>

These results suggest that multiple sexual partnerships of one type or another may be much more common in Uganda than generally assumed and that models of transmission based on DHS data may give misleading results. Better methods are needed to monitor the frequency of this key behavior for HIV transmission and also to monitor for potential behavioral disinhibition caused by availability of treatment for AIDS.

## REFERENCES

- Okware S, Opio A, Musinguzi J, et al. Fighting HIV/AIDS: is success possible? *Bull World Health Organ*. 2001;79:1113–1120.
- Stoneburner RL, Low-Beer D. Population-level HIV declines and behavioral risk avoidance in Uganda. *Science*. 2004;304:714–718.
- Uganda AIDS Commission. *Moving Toward Universal Access: National HIV & AIDS Strategic Plan 2007/8–2011/12*. Kampala, Uganda: Uganda AIDS Commission; 2007.
- Kirby D. Changes in sexual behavior leading to the decline in the prevalence of HIV in Uganda: confirmation from multiple sources of evidence. *Sex Transm Infect*. 2008;84(suppl 2):35–41.
- Green EC, Halperin DT, Nantulya V, et al. Uganda's HIV prevention success: the role of sexual behavior change and the national response. *AIDS Behav*. 2006;10:335–346.
- Uganda Bureau of Statistics and Macro International Inc. *Uganda Demographic and Health Survey 2006*. Calverton, MD: Macro International; 2007.
- MEASURE DHS. STATcompiler. ICF Macro. Available at: <http://www.statcompiler.com>. Accessed September 25, 2010.
- Montaner JS, Lima VD, Barrios R, et al. Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study. *Lancet*. 2010;376:532–539.
- Green EC, Kajubi P, Kanya S, et al. Current perceptions of HIV prevalence and multiple partner sex in Uganda [MOPE0590]. Presented at: XVIII International Conference on AIDS; Vienna, Austria; July 19, 2010.
- da Silva CG, Gonçalves D, Pacca JC, et al. Optimistic perception of HIV/AIDS, unprotected sex, and implications for prevention among men who have sex with men, São Paulo, Brazil. *AIDS*. 2005;19(suppl 4):S31–S36.
- Van de Ven P, Rawstone P, Nakamura T, et al. HIV treatments optimism is associated with unprotected anal intercourse with regular and with casual partners among Australian gay and homosexually active men. *Int J STD AIDS*. 2002;13:181–183.
- Elford J, Bolding G, Sherr L. High-risk sexual behavior increases among London gay men between 1998 and 2001: what is the role of HIV optimism? *AIDS*. 2002;16:1537–1544.
- Stall RD, Hays RB, Waldo CR, et al. The gay 90s: a review of research in the 1990s on sexual behavior and HIV risk among men who have sex with men. *AIDS*. 2000;14(suppl 3):S101–S114.
- Stata [computer program]. Release 11. College Station, TX: StataCorp LP; 2009.
- Uganda Ministry of Health and ORC/Macro. *Uganda HIV/AIDS Sero-Behavioural Survey: 2004–2005*. Kampala, Uganda: Ministry of Health; 2006.
- The last 100 HIV infections. *UNAIDS Outlook Report*. Issue No. 2. Geneva, Switzerland: UNAIDS; 2010:14–15.
- Helleringer S, Kohler HP, Chimbi A, et al. The Likoma Network Study: context, data collection, and initial results. *Demogr Res*. 2009;21:427–468.
- Hladik W, Musinguzi J, Kirungi W, et al. The estimated burden of HIV/AIDS in Uganda, 2005–2010. *AIDS*. 2008;22:503–510.
- Munjoma MW, Mhlanga FG, Mapingure MP, et al. The incidence of HIV among women recruited during late pregnancy and followed up for six years after childbirth in Zimbabwe. *BMC Public Health*. 2010;10:668.