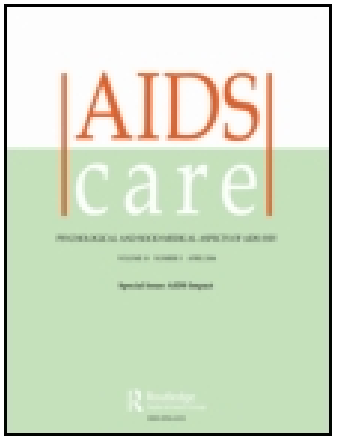

AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/caic20

Women, economic hardship and the path of survival: HIV/AIDS risk behavior among women receiving HIV/AIDS treatment in Uganda

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Published online: 22 Jul 2009.

To cite this article: Ellen MacLachlan, Stella Neema, Emmanuel Luyirika, Francis Ssali, Margrethe Juncker, Charles Rwabukwali, Marie Harvey & Terry Duncan (2009) Women, economic hardship and the path of survival: HIV/AIDS risk behavior among women receiving HIV/AIDS treatment in Uganda, AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, 21:3, 355-367

To link to this article: http://dx.doi.org/10.1080/09540120802184121

AIDS Care
Vol. 21, No. 3, March 2009, 355–367

Women, economic hardship and the path of survival: HIV/AIDS risk behavior among women receiving HIV/AIDS treatment in Uganda

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(Received 19 October 2007; final version received 6 May 2008)

The results are presented from a 2005 survey of 377 women in four HIV/AIDS treatment programs in Uganda. The aim of the study was to explore women's economic hardships and the association with four sexual risk behaviors: whether a woman was sexually active in the last 12 months, whether a condom was used during the last sex act, whether she reported having had a sexual partner in the last six months who she suspected had multiple partners and report of forced, coercive or survival sex in the last six months. Few women were sexually active (34%), likely due to the high proportion of widows (49%). Married women were likely to report forced, coercive or survival sex (35%). Eighty-four percent of women reported condom used at last sex act. Forced, coercive or survival sex was associated with number of meals missed per week (AOR = 1.125, 95% CI 1.11, 1.587, $p < 0.05$). Sex with a partner in the last six months who a woman suspected had multiple partners was also associated with number of missed meals per week (AOR = 2.080, 95% CI 1.084, 3.992). Currently women in Ugandan antiretroviral therapy programs are not likely to be sexually active, except for married women. Many women need to find food and other support, which may put them at risk of forced, coercive or survival sex due to dependency on men.

Keywords: HIV/AIDS treatment; HIV/AIDS prevention; developing countries; sexual risk behaviors; gender inequality; poverty; secondary transmission of HIV

Introduction

Women and HIV risk

In 2006 around three million people died of AIDS around the world. Sub-Saharan Africa accounted for the bulk of these deaths, with 2.1 million deaths in 2006 (UNAIDS, 2006). Since 2001 women have accounted for close to 60% of those living with HIV/AIDS in the region (UNAIDS, 2004). Clearly, of all regions, women in sub-Saharan Africa are the most devastated by HIV/AIDS. No other region in the world displays such an impact on women and girls: 77% of all HIV-positive women in the world live in sub-Saharan Africa (UNAIDS, 2004).

When used consistently and correctly, male condoms are the most effective method of protecting against HIV for sexually active persons (O'Leary & Jemmott, 1995; Stone, 1990). Unfortunately, many men are unwilling to use male condoms and, due to strong gender-based power differentials and conservative social and cultural norms in many societies, women may be unable to negotiate the use of a male condom (Cohen, 2004; Gupta, 2002).

HIV-positive women

Studies have indicated that HIV prevention methods, such as the use of the male condom, are as critical for women who are HIV-positive as they are for women who are not infected (Crepaz & Marks, 2002; McGowan et al., 2004; Moon, Vermund, Tong, & Holmberg, 2001). Attention to prevention in positives in sub-Saharan Africa is especially critical because of the high prevalence of HIV in many African countries and the increasing numbers of people staying alive with HIV due to the expansion of HIV treatment programs in the region (CDC, 1998; UNAIDS, 2007).

The growth of HIV/AIDS treatment programs in developing countries should be a signal to closely examine the risk behaviors of those receiving treatment to ensure that further transmission is minimized (Gayle & Lange, 2004). Research to this effect has

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ISSN 0954-0121 print/ISSN 1360-0451 online

DOI: 10.1080/09540120802184121
http://www.informaworld.com

begun to be conducted in Brazil, South Africa and Uganda regarding antiretroviral (ART) and sexual risk behaviors (Bunnell et al., 2006; Eisele et al., 2007; Petersen, Boily, & Bastos, 2006; Stein, 2005) but few studies specific to HIV-positive women receiving ART in these settings have been published (UNAIDS, 2004).

Structural and environmental determinants

Many of the concerns with traditional behavioral models of HIV risk reduction in women that rely on individual behavior change have resulted in the publication of numerous articles proposing a new paradigm for HIV/AIDS risk. By and large this new paradigm argues for a structural and environmental conceptualization of HIV/AIDS prevention (Decosas, 1996; Farmer, 2003; Lurie, Hintzen, & Lowe, 2004; O'Leary & Martins, 2000; Parker, Easton, & Klein, 2000, 2002; Sumartojo, 2000; Sweat & Denison, 1995; Tawil, Verster, & O'Reilly, 1995; Turshen, 1998).

Termed "political economic" approaches by medical anthropologists and "structural and environmental" approaches by the public health community, these writings explore "the interactive or synergistic effects of social factors such as poverty and economic exploitation, gender power, sexual oppression and racism in creating what can be described as forms of 'structural violence', which directly determines the social vulnerability of groups and individuals" (Farmer, Connors, & Simmons, 1996; Parker et al., 2000). The purpose of this study was to examine such structural factors and their relationship with HIV/AIDS risk behaviors among HIV-positive women in Uganda enrolled in ART programs.

Methods

Participants

Three hundred and ninety-eight women were interviewed during May and June of 2005 at three different ART programs in Kampala (Reach Out Mbuya Parish HIV/AIDS Initiative, the Joint Clinical Research Centre (JCRC) and the Mildmay International HIV/AIDS Centre) and one ART program in Masaka (Uganda Cares). The inclusion criteria were any women (1) aged 18–49 years old; (2) who had been on free ART for six months or longer; and (3) who agreed to participate in the survey. All analyses were done using SPPS statistical software (SPSS for Windows 15.0 – 2005).

Data collection procedures

Non-probability purposive sampling methods were used, meaning that the sampling was a non-random recruitment of a certain quota of specific women in the program who met the study criteria (Patton, 1990). The quota sampling was non-proportional, meaning that all women of the right age and length of time on ART were included in the study until the quota was reached (approximately 100 women from each site). The interviewers visited all the programs at their convenience; however, with the result that the women included in the study depended on which women happened to be at the clinic that day refilling their ART prescription.

At each clinic a program staff person alerted women arriving that researchers were recruiting patients for a study. All the interviewers were female, aged 24–34 years old. Interviewers were trained by the researcher on how to administer each question in the questionnaire, with care given to explanation of the purpose of the question and the possible response categories. Interviewers were trained to respect the confidential nature of the interview and any medical and/or social history divulged during the interview.

Data analysis plan

Bivariate analyses were performed between (1) women's personal characteristics and then (2) women's socio-economic profile and sexual activity and sexual risk behavior outcomes. These analyses included independent *t*-tests, Chi-square and ANOVA to determine whether differences were statistically probable at a 0.05 (two-tailed) alpha level and 95% confidence intervals.

Variables were entered into multinomial logistic regression to determine the contribution of the variables to the outcome dependent variables (1) sexually active; (2) condom use at last sexual intercourse; (3) sex with a man with other partners in the last six months; and (4) forced, coercive or survival sex when controlling for personal characteristics and socio-economic variables. The variables were included in regression models only if they were statistically significant in bivariate analysis.

Measures

The results generated from formative work helped in crafting a detailed questionnaire. The final questionnaire contained both new questions and previously published questions that needed to be adapted to the present population. Adaptation of the questions was assisted by a pilot study of 12 eligible women at the beginning of the study and through in-depth

interviews with several women in the ART programs. The study instrument was translated into Luganda and this translated instrument was used by the interviewers. Descriptions of the key outcome measures and key predictor variables are available in Appendix 1.

Results

A total of 377 completed questionnaires were analyzed. Participants ranged from 18 to 49 in age and from 6 to 107 months in length of ART. The average ART length was 16 months and the average age was 36 (Table 1). About a third ($n = 128$, 34%) of the 377 women were sexually active at the time of the interview (Table 2). Of these 128 women, 96 (84%) reported that a condom was used during the last sexual act (Table 2). In the group of 377 women interviewed 59 (15.6%) reported any forced, coercive or survival sex in the last six months. Of these, 14.9% reported forced or coercive sex and 5% reported survival sex.

Table 1. Personal characteristics of the study sample ($N = 377$).

Age	
18–29 years	15.4%
30–39 years	46.1%
40–49 years	38.5%
Mean age	36.3 Years
Marital status	
Single	14.6%
Married	20.4%
Widowed	49.3%
Divorced or Separated	15.6%
Employed	63.4%
Education level	
0–9 years	64.4%
10–12+ years	34.2%
ART length	
6–12 months	45.6%
12–18 months	27.3%
>18 months	27.0%
Religion	
Catholic	47.2%
Protestant	26.8%
Other	26.0%
Ethnicity	
Muganda	52.8%
Banyankore	13.0%
Banyaruanda	4.2%
Basoga	4.0%
Acholi	3.7%
Iteso	2.9%
Mutooro	2.9%
Other	16.4%

Table 2. Sexual profile of the study sample ($N = 130$).

Sexually active	34.5% (130/377)
Forced, coercive or survival sex	15.6% (59/377)
% with one sex partner (three months)	89% (115/129)
% with one sex partner (six months)	91% (117/128)
Ever used condom	86.1% (112/130)
Condom used at last sex act	73.8% (96/130)
Ever asked partner to use condom	87.7% (114/130)
Partner ever refused condom	46.9% (61/130)
Disclosed HIV status to partner	78.5% (102/130)
Partner is HIV positive	
Yes	56.9% (74/130)
No	5.4% (7/130)
Don't know	10.8% (14/130)
Won't test	24.6% (32/130)
Pregnant during the last year	16.9% (22/130)
Desire children	44.6% (58/130)
In last six months	
Sex with partner with other partners	55.4% (72/130)
Sex with drunk partner	13.8% (18/130)
Sex with partner of unknown HIV serostatus	25.4% (33/130)
Sex with partner she won't see again	14.6% (19/130)
Sex with partner who doesn't know her HIV serostatus	13.8% (18/130)

Sexual activity

Bivariate

Several personal characteristics were associated with being sexually active, including age, marital status, ART length and number of orphans (see Table 3). The strongest of these bivariate associations were marital status and ART length. Three socio-economic factors were associated with sexual activity: whether she was employed or not, household income and total monthly housing costs (see Table 4).

Multivariate

As with bivariate analysis, married women were very likely to be sexually active (AOR = 47.837, 95% CI 8.185, 256.70) but this was not statistically significant for widowed women in multivariate analysis. Also younger women were more likely to be sexually active (AOR = 0.889, 95% CI 0.829, 0.954). No variables

Table 3. Bivariate associations between women's personal characteristics and sexual activity.

	Sexually active 130 (34.5%)	Not sexually active 247 (65.5%)	Sig. P^2
Age (years)			
18–29	50.0	50.0	0.008
30–39	36.2	63.8	–
40–49	26.2	73.8	0.007
Marital status			
Single	23.6	76.4	–
Married	94.8	5.2	0.000
Widowed	13.4	86.6	0.000
Divorced/Separated	32.2	67.8	–
Education level (years)			
0–9	33.7	66.3	–
10–12+	35.7	64.3	–
ART length (months)			
6–12	41.3	58.7	0.011
12–18	39.8	60.2	–
>18	17.6	82.4	0.000
Religion			
Catholic	30.9	69.1	–
Protestant	38.6	61.4	–
Other	36.7	63.3	–
Children			
Mean number of orphans	1.13	2.02	0.000
Mean number of children total	3.64	3.86	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

associated with income (employment, household income or women's personal income) were statistically predictive of whether a woman was sexually active or not in multivariate analysis (see Table 5).

Any forced, coercive or survival sex

Bivariate

Two personal characteristics were associated with any forced, coercive or survival sex: marital status and religion (Table 6). Married women were more likely than women in other marital categories to have reported this (35.1%, $p = 0.000$) and widowed women least likely to have reported it (8.6%, $p = 0.000$). Four socio-economic factors were associated with any forced, coercive or survival sex in the last six months (Table 7): women's personal income level, ability to pay school fees, the number of meals a woman missed per week and ability to pay rent.

Multivariate

For outcome of forced, coercive or survival sex, married marital status accounted for the most variance (AOR = 3.193, 95% CI 1.084, 10.55). Women who reported that they were able to pay their children's school fees were less likely to have reported this kind of sex (AOR = 0.367, 95% CI 0.141, 0.955). The continuous variable of number of meals missed per week was predictive of forced, coercive or survival sex (AOR = 1.251, 95% CI 1.11, 1.587), with women who reported missing more meals more likely to have reported this kind of sexual activity (Table 5).

Condom use at last sex act

Bivariate

Only one of the personal characteristics of women, religion, was associated with condom being used at last sex act (Table 8). No income, hunger status, school fee burden or housing variables were significantly associated with condom use at last sex act.

Multivariate

In multivariate analysis of condom being used at last sex act the total amount of school fees paid was predictive of condom use at last sex act (AOR =

Table 4. Bivariate associations between women's socio-economic factors and sexual activity.

	Sexually active 130 (34.5%)	Not sexually active 247 (65.5%)	Sig. P^2
Employment			
Yes	38.1	61.9	0.034
No	28.3	71.7	–
Household income (UgSh)			
0–50,000	28.7	71.3	0.029
50–100,000	37.8	62.2	–
100–200,000+	39.8	60.2	–
Woman's income	64,000 UgSh	51,000 UgSh	–
No. of meals missed per week	0.92	1.28	–
Borrows food			
Yes	35.1	64.9	–
No	33.8	66.2	–
Has food today			
Yes	35.7	64.3	–
No	32.2	67.8	–
Amount of school fees (one term)	213,000 UgSh	211,000 UgSh	–
Able to pay fees			
Yes	35.2	64.8	–
No	34.5	65.5	–
Total monthly housing cost	36,400 UgSh	26,900 UgSh	0.027
Able to pay rent			
Yes	36.5	63.5	–
No	42.3	57.7	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

1.017, 95% CI 1.000, 1.039). Many of the statistical cells for condom use, however, had very low sample sizes (Table 5).

Sex with partner with multiple partners

Bivariate

None of the personal characteristics of women were associated with engaging in sex with a partner who has multiple partners. The only socio-economic factors that were statistically significant in bivariate analysis were hunger status variables (Table 9).

Multivariate

Married women (AOR = 0.141, 95% CI 0.020, 0.998) and widowed women (AOR = 0.060, 95% CI 0.005, 0.713) were less likely than women in other marital status categories to report sex with a partner with multiple partners. Women in low and medium income brackets were much more likely to report sex with a partner who had several partners (AOR = 33.94, 95% CI 1.12, 1253 for women in the 0–50,000 UgSh bracket and AOR = 65.04, 95% CI 1.00, 4231) than higher income women in multivariate analysis, although this analysis was hampered by small sample size. Women who were employed were more likely than those unemployed to have reported sex with a partner with multiple partners (AOR = 10.30, 95% CI 1.10, 96.46). Finally, women who reported more missed meals were twice as likely as women with fewer missed meals to have had a partner who has other sexual partners (AOR = 2.080, 95% CI 1.084, 6.393) (Table 5).

Discussion

The results of this survey indicate that women receiving HIV/AIDS treatment in Uganda have unique needs and circumstances that should be acknowledged in the design and evaluation of HIV/AIDS treatment programs. Even though the average length in HIV treatment for the women studied was 16 months, only one third of the women interviewed reported that they were sexually active. This finding likely reflects the high number of widows in the study, and divorced and separated women, who have not had sexual partners for many years.

Table 5. Results of multinomial logistic regression.

	Sexually active		Forced, coercive or survival sex		Condom use at last sex act		Sex w/partner w/multiple partners	
	AOR[a]	95% CI	AOR[a]	95% CI	AOR[a]	95% CI	AOR[a]	95% CI
Personal characteristics								
Age	0.889	0.829, 0.954	0.988	0.923, 1.056	1.002	0.820, 1.224	0.929	0.824, 1.047
Marital status								
Single	0.459	136, 1.552	0.938	0.246, 3.575	0.261	0.007, 9.614	1.141	0.082, 15.807
Married	.47.837††	8.185, 256.70	3.193*	1.084, 10.55	0.935	0.035, 24.74	0.141*	0.020, 0.998
Widowed	0.416	0.154, 1.123	0.492	0.156, 1.554	0.174	0.006, 5.308	0.060*	0.005, 0.713
Div/Sep	0[b]	0[b]	0[b]	0[b]				
Education	0.965	0.863, 1.080	1.015	0.905, 1.138	1.238	0.775, 1.971	0.987	0.821, 1.188
ART length	0.975	0.925, 1.028	0.989	0.935, 1.047	1.012	0.790, 1.297	1.010	0.890, 1.148
No. of children total	1.171	0.945, 1.452	1.084	0.858, 1.371	0.752	0.283, 2.001	0.941	0.620, 1.428
No. of orphans total	0.857	0.636, 1.155	0.935	0.709, 1.232	0.569	0.242, 1.340	1.233	0.722, 2.106
Religion								
Catholic	0.712	0.322, 2.170	0.807	0.304, 2.144	23.124	0.382, 1400	0.661	0.135, 3.245
Protestant	0.602	0.473, 3.629	1.492	0.535, 4.161	0.055	0.002, 1.6770[b]	0.446	0.090, 2.202
Other	0[b]	0[b]		0[b]				
Income								
Employment	1.885	0.725, 4.901	1.284	0.476, 3.467	10.48	0.245, 447	10.30*	1.10, 96.46
Household income (UgSh)								
0–50,000	2.216	0.341, 13.254	0[c]		0[c]		33.94*	1.12, 1253
50–100,000	1.273	0.186, 8.703	0[c]		0[c]		65.04*	1.00, 4231
100–200,000+	0.810	0.109, 6.010	0[c]		0[c]		19.16	0.326, 1126
Woman's income	1.004	0.998, 1.009	1.004	1.000, 1.008	1.000	0.988, 1.011	1.002	0.994, 1.010
Housing								
Total housing cost	0.995	0.983, 1.007	1.000	0.987, 1.012	0.987	0.943, 1.032	0.992	0.972, 1.014
Able to pay rent	0.973	0.404, 2.346	0.590	0.222, 1.569	0.073	0.001, 7.628	0.392	0.081, 1.905
Education								
Total school fees	0.998	0.996, 1.007	0.999	0.997, 1.001	1.017*	1.000, 1.039	0.999	0.997, 1.002
Able to pay fees	0.973	0.404, 2.346	0.367*	0.141, 0.955	1.327	0.158, 11.175	0.410	0.083, 2.020
Hunger status								
No. of missed meals	1.057	0.827, 1.351	1.251*	1.11, 1.587	0.815	0.337, 1.974	2.080*	1.084, 3.992
Borrows food	0.850	0.371, 1.945	0.777	0.322, 1.875	0.249	0.010, 5.987	0.808	0.136, 4.790
Has food today	1.404	0.606, 3.250	0.724	0.312, 1.679	2.285	0.129, 40.59	1.386	0.301, 6.393

*$p < 0.05$, †$p < 0.005$, ††$p < 0.0005$.

[a]Controlling for all other factors in table.

[b]This parameter is set to zero because it is redundant.

[c]This parameter is set to zero due to zero cells.

Table 6. Bivariate associations between women's personal characteristics and any forced, coercive or survival sex.

	Any forced, coercive or survival sex (6mo) 59 (15.6%)	No forced, coercive or survival sex (6mo) 318 (84.4%)	Sig. P^2
Age (years)			
18–29	15.5	84.5	–
30–39	17.2	82.8	–
40–49	13.8	86.2	–
Marital status			
Single	12.7	87.3	–
Married	35.1	64.9	0.000
Widowed	8.6	91.4	0.000
Divorced or Separated	15.3	84.7	–
Education level (years)			
0–9	16.0	84.0	–
10–12+	15.5	84.5	–
ART length (months)			
6–12	15.7	84.3	–
12–18	18.4	81.6	–
>18	12.7	87.3	–
Religion			
Catholic	10.1	89.9	0.005
Protestant	21.8	78.2	–
Other	19.4	80.6	–
Children			
Mean number of orphans	1.56	1.74	–
Mean number of children total	3.85	3.77	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

Nevertheless, the finding that so few women were sexually active was unexpected. The limited number of sexually active women made it more difficult to determine factors associated with sexual risk behaviors because of insufficient sample size. A further explanation for the low sexual activity is that the ART programs in Uganda began in the mid 2000s with an urgent demand for treatment from middle-aged women in the later stages of AIDS who had many dependents. The number of dependents likely motivated women to seek treatment to stay alive. In fact, so far in many ART programs women comprise 60% or more of the recipients (Kiguba et al., 2007) which testifies to women's intense motivation to stay alive.

Although most women were not sexually active, half of the sexually active women in this sample were married women. Thus, many of the analyses done in this study around sexual behavior may reflect the behaviors of married women. For example, among all sexually active women condom use was fairly high. However, on the negative side, forced, coercive or survival sex was common, and especially among married women.

Sexual exchange partnerships

Overall the results suggest that at least some of the women in the sample were engaging in short-term sexual exchange partnerships, or survival sex, in order to support themselves and their dependents. Or women may be coerced or forced into sex if they find themselves in situations where they are economically dependent on a man and cannot deny him.

Evidence for these kinds of relationships in the study was that women who reported more missed meals had a higher prevalence of forced, coercive or survival sex (in bivariate and multivariate analyses) and sex with a partner with multiple partners (in bivariate and multivariate analyses), even though they were less sexually active overall. In addition, women able to pay school fees (in multivariate analysis) and women able to pay housing costs (in bivariate analysis) reported fewer instances of forced, coercive or survival sex. Finally, women who reported needing to borrow food to get by reported more partners who had multiple partners than those that did not need to borrow food (in bivariate analysis).

Table 7. Bivariate associations between women's socio-economic factors and any forced, coercive or survival sex.

	Any forced, coercive or survival sex (6mo) 59 (15.6%)	No forced, coercive or survival sex (6mo) 318 (84.4%)	Sig. P^2
Employment			
Yes	17.6	82.4	–
No	12.3	87.7	–
Household income (UgSh)			
0–50,000	12.9	87.1	–
50–100,000	22.2	77.8	–
100–200,000+	15.1	84.9	–
Woman's income	76,250 UgSh	51,450 UgSh	0.022
No. of meals missed per week	1.76	1.04	0.010
Borrows food			
Yes	17.3	82.7	–
No	13.1	86.9	–
Has food today			
Yes	14.5	85.5	–
No	18.2	81.8	–
Amount of school fees (one term)	184,000 UgSh	217,000 UgSh	–
Able to pay fees			
Yes	20.1	79.9	0.009
No	10.3	89.7	–
Total monthly housing cost	35,500 UgSh	29,100 UgSh	–
Able to pay rent			
Yes	13.8	86.2	0.009
No	28.2	71.8	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

Higher school fees was also associated with higher condom use rates in multivariate analysis, possibly indicating that women who seek out casual relationships in order to support herself and her children usually use condoms or are able to convince their short or long-term partner to use a condom. However, condom use results were very limited by a low sample size.

In any case, there are several reasons why women may need to engage in transactional types of relationships. The majority of women had an enormous economic burden: an average of 132 US dollars in school fees per term, an average of 11 US dollars for food per week, and 19 US dollars in rent to pay (Tables 10 and 11) or a total of 170 US dollars per month in a country where the average monthly income is 30 US dollars. The current exchange rate is 1$US = 2,016 UgSh.

It is interesting to note that in bivariate analysis the results indicated that women who were able to pay school fees were more likely to report forced, coercive or survival sex whereas in multivariate analyses being able to pay school fees had a protective effect. It may be that the bivariate association reflected the woman's marital status, with married women much more likely to be able to pay school fees due to a spouse but also more likely to experience forced, coercive or survival sex. With marital status controlled for in multivariate analysis, however, this association disappeared.

The risks of partnered women

Additional findings, however, seem to conflict with the conclusion that a woman's economic needs drive her sexual risk behavior. Ultimately the findings from this study present a more complicated picture of the relative role of economic burden in the sexual risk behaviors of this population. For example, some conflicting findings are that employed women are more sexually active than unemployed women (in bivariate analysis) and more likely to use a condom or have sex with a partner with multiple partners (in multivariate analysis). In addition, women with low

Table 8. Bivariate associations between women's personal characteristics and condom use at last sex act.

	Condom last sex act ($N=130$) 96 (73.8%)	No condom last sex act ($N=130$) 18 (13.8%)	Sig. P^2
Age (years)			
18–29 years	92.0	8.0	–
30–39 years	81.4	18.6	–
40–49 years	83.3	16.7	–
Marital status			
Single	72.7	27.3	–
Married	87.3	12.7	–
Widowed	79.2	20.8	–
Divorced/Separated	87.5	12.5	–
Education level (years)			
0–9	85.5	14.5	–
10–12+	86.0	14.0	–
ART length (months)			
6–12	78.3	21.7	–
12–18	91.9	8.1	–
>18	88.2	11.8	–
Religion			
Catholic	93.3	6.7	0.023
Protestant	72.2	27.8	0.021
Other	84.8	15.2	–
Children			
Mean number of orphans	1.13	1.83	–
Mean number of children total	3.75	3.89	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

household income are less sexually active (in bivariate analysis) and the higher a woman's personal income (in bivariate analysis) the more she reported forced, coercive or survival sex.

Although superficially these results seem to conflict with the discussion of impoverished women, many of these results probably reflect the risks of married women or women with long-term partners. One indication of this is that many of the conflicting results are from bivariate analyses and not from multivariate analyses where marital status and other factors are controlled. For example, it seems likely that the bivariate finding that a higher women's income is associated with women's reports of forced, coercive or survival sex is due, in part, to the economic contribution of a spouse and, thus, reflects the risks of marriage or close partnership with a man. Similarly, the result that women with lower incomes had lower levels of sexual activity most likely reflects the high number of non-sexually active women in the sample and their low income due to not having spousal or partner support. Employed women's higher sexual activity in bivariate analyses may reflect that the highest proportion of employment was found among married women.

Other evidence of the risks of partnered women is that the bivariate association that indicates that the ability to pay school fees is associated with increased forced, coercive or survival sex most likely reflects a woman's partnered status and thus her increased risk of forced, coercive or survival sex. In multivariate analysis the ability to pay school fees shows a protective effect against this outcome. The risks of married women were confirmed in multivariate analysis; married women in the sample were three times more likely than unmarried women to experience forced coercive or survival sex.

Overall this study shows that socio-economic status is a difficult marker for women's HIV/AIDS risk behavior. The study reveals a paradox that both economic hardship and economic prosperity can result in increased risk for women (Piot, Greener, & Russell, 2007). The important difference may be that economic prosperity, because it is most likely the

Table 9. Bivariate associations between women's socio-economic factors and sex with a partner who has other partners.

	Sex w/ partner who has other partners ($N=130$) 72 (55.4%)	No sex w/partner who has other partners ($N=130$) 53 (41.0%)	Sig. P^2
Employment			
Yes	60.0	40.0	–
No	51.4	48.6	–
Household income (UgSh)			
0–50,000	55.3	44.7	–
50–100,000	57.6	42.4	–
100–200,000+	65.7	34.3	–
Woman's income	73,000 UgSh	54,500 UgSh	–
No. of meals missed per week	1.28	0.52	0.009
Borrows food			
Yes	67.1	32.9	0.005
No	41.3	58.7	–
Has food today			
Yes	56.3	43.7	–
No	60.5	39.5	–
Amount of school fees (one term)	199,000 UgSh	239,000 UgSh	–
Able to pay fees			
Yes	63.2	36.8	–
No	51.9	48.1	–
Total monthly housing cost	34,000 UgSh	40,300 UgSh	–
Able to pay rent			
Yes	51.5	48.5	–
No	69.0	31.0	–

Note: P^2 values from chi-square test for categorical variables or one-way ANOVA for continuous variables.

result of a union with a man, is accompanied by strong gender power differentials that may ultimately put women at high risk due to an inability to negotiate condom use. On the other hand, poor women who engage in survival sex because they do not have a spouse or long-term partner may be more able to negotiate condom use; however, this possibility is only scantily supported by the data and would

Table 10. Socio-economic profile of the study sample ($N=377$).

Household income	
0–50,000	45.3%
50–100,000	23.9%
1–200,000+	24.7%
Woman's income	55,304 UgSh
No. of meals missed per week	1.16
Borrows food	61.3%
Has food today	67.6%
Number of food dependents	4.90
Weekly food costs	17,000 UgSh
Number of children at home	3.79
Has orphans to care for	56.5%
Number of orphans	1.71
School fees paid per term	211,000 UgSh
Misses school fees	43.8%

Table 11. Standard of living indicators of the study sample ($N=377$).

Monthly housing costs	32,200 UgSh
Misses rent (%)	27.3
Concrete floor (%)	78.5
Screened windows (%)	43.8
Intact roof (%)	67.4
Household items (%)	
Electricity	48.3
Radio	73.5
Television	30.8
Bicycle	14.9
Refrigerator	18.0
Motorcycle	2.7
Crime concern (%)	
Not concerned	17.5
A little concerned	26.0
Very concerned	54.1
Crime victim (in last month) (%)	9.0

need further study. Certainly research exists that supports marriage as being the most likely union to have strong gender power differences (Rwabukwali et al., 1994) that would limit a woman's ability to protect herself. Other authors have found that there are certain circumstances when a married Ugandan woman may take other sexual partners, including economic need, desire for greater sexual satisfaction, or revenge on a husband with other partners (McGrath et al., 1993). The interplay, therefore, between marriage, concurrent long-term partnership and how poverty drives women's sexual behaviors and experiences of forced, coerced or survival sex needs much more research (Epstein, 2007).

Acknowledgements

The authors would like to acknowledge the Makerere Institute of Social Research (MISR) at Makerere University and the Kampala and Masaka HIV/AIDS treatment centers that made this research possible: Reach Out Mbuya Parish HIV/AIDS Initiative, JCRC – Joint Clinical Research Centre, The Mildmay Centre and Uganda Cares of Masaka.

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Appendix 1: Study measures

Key outcome measures

1. *Sexually active*. Women were considered sexually active if they reported any sexual partner within the previous 12 months. This measure was included in the survey due to the high likelihood in this setting that women receive abstinence counseling in their respective ART programs. It is also included because of the common, normative use of abstinence as an HIV prevention measure in Uganda, for both men and women. Sexual activity should not, however, be considered a risk behavior because sexually active persons can protect themselves to the point that they are essentially at zero risk.
2. *Sex with a man with multiple partners*. Women were asked "During the past 6 months, have you had sexual intercourse with a man who you knew or suspected was having sex with other women?". This was adapted from the "WHO Multi-country Study on Women's Health and Domestic Violence against Women" and is used here because of the cultural context of Uganda, where multiple, concurrent sexual partnerships are known to substantially increase HIV (Epstein, 2007; WHO, 2005). Men are more likely than women to engage in multiple, concurrent sexual partnerships. These relationships are also common among women, however, it was not asked of women in this study. Only a small percentage of women had no idea whether or not their partner had multiple partners.
3. *Condom use at last sex act*. Women were asked "The last time that you had sex with your current/most recent partner did you use a condom?" in order to assess prevalence of unprotected sex and to minimize recall bias (DiClemente et al., 2004).
4. *Forced, coercive or survival sex*. The prevalence of forced, coercive or survival sex was measured using five questions, mostly adapted from the "WHO Multi-country Study on Women's Health and Domestic Violence against Women" and also using other published materials (Kaye, Mirembe, & Bantebya, 2002; Koenig et al., 2004; WHO, 2005). These questions were: (1). Has your main partner forced you to have sex with him even when you didn't feel like it (by using physical force, threats, intimidation, withholding economic support, etc.) in the last six months? (2). Has a man fondled you or touched your body when you didn't want in the last six months (by using physical force, threats, intimidation, blackmail, deception, etc.)? (3). Has a man forced you to have sex with him even when you didn't feel like it (by using physical force, threats, intimidation, withholding economic support, etc.) in

the last six months? (4). Have you let a man fondle you or touch your body in the last six months in order to get some goods in return (e.g., food, clothing, money)? (5). Have you let a man have sex with you in the last six months in order to get some goods in return (e.g., food, clothing, money)? Although questions 4 and 5 related to survival sex are somewhat conceptually different from questions 1–3, all five measures were collapsed into a continuous "count" variable of a "Yes" response to any of the five situations due to the small sample of women who reported any of these experiences.

Key predictor measures

1. *Personal characteristics*. The personal characteristics assessed were: age, marital status (divorced and separated were collapsed due to low numbers), education level, ART length (number of months in the ART program; three categories were created), religion (collapsed to Catholic, Protestant and Other due to low numbers in several categories) and children (number of children total and number of orphans). Orphan was defined as at least one parent being dead and not biologically related to the woman.
2. *Socio-economic factors – Income*. Women were asked several questions about income. They were considered employed if they had any current source of income, including farming, casual labor and gifts/donations. Women were asked to estimate total household income using the question "What is your monthly household income? (Probe for all members of household combined)". Then she was asked her monthly income using the question "How much money do you yourself have to spend as you wish each month (whether it is your own or given to you by a spouse/partner)?".
3. *Socio-economic factors – Housing*. Each woman was asked to estimate household housing costs "What are your TOTAL monthly housing costs (whether you pay it or someone else)? (Include electricity and water): (in Ugandan Shillings)" and whether they are able to pay rent "In the last six months has your household always been able to pay housing costs?".
4. *Socio-economic factors – Education*. Each woman was asked how much she spends on school fees for all children combined (if the woman had children) "What is the total amount of school fees that need to be paid each term (whether you pay it or someone else; for all children combined)?: (in Ugandan Shillings)" and whether or not the household had trouble paying these school fees regularly "How many times in this school term would you say you were unable to pay school fees?".
5. *Socio-economic factors – Hunger Status*. Each woman was asked three questions aimed at measuring hunger status. These questions were partially adapted from the PhD dissertation of Paulina Lorenzana (Lorenzana & Mercado, 2002). Women were asked "In the last week how many meals did you miss? (number of meals)" then "Do you ever borrow food from a neighbor or obtain food on credit to get by?" and finally "Do you have enough food for yourself and your family right now (today)?".