

Gender inequities in sexual risks among youth with HIV in Kigali, Rwanda

F S Test MPH*, **S D Mehta** PhD MHS[†], **A Handler** Dr PH MPH*, **E Mutimura** PhD[‡], **A M Bamukunde** BSN[‡] and **M Cohen** MD[§]

*School of Public Health, Division of Community Health Sciences; [†]School of Public Health, Division of Epidemiology/Biostatistics, University of Illinois at Chicago, 1603 W Taylor St, Chicago, IL 60612, USA; [‡]Women's Equity in Access to Care & Treatment, Avenue Karisimbi, Dorona House, Kigali, Rwanda; [§]Departments of Medicine, Stroger Hospital and Rush University, 2255 W Harrison St, Suite C, Chicago, IL 69612, USA

Summary: Understanding the experiences of youth living with HIV (YLH) is necessary for implementing interventions that mitigate HIV transmission. We conducted a survey of sexual behaviours and sources of knowledge among 107 youths aged 16–24 attending two HIV clinics in Kigali, Rwanda. Respondents were 72% women and 28% men, with median age 18 years. Of those sexually active in the past six months, 56% reported inconsistent condom use; 53% of sexually active respondents reported having sexually transmitted infection (STI) symptoms in the past six months. The median age difference between respondent and first sex partner was nine years for women, and 0.5 years for men ($P = 0.006$). Women more frequently reported being forced to have sex (29% girls versus 6.5% boys, $P = 0.011$) and exchanging sex for money (66% girls versus 17% boys, $P = 0.033$). Strengthening female YLH's financial and material resources may reduce the number of sexual partners, asymmetries within partnerships and risk of HIV transmission.

Keywords: HIV, youth, adolescent, sexual behaviour, gender disparities, Africa

INTRODUCTION

As of 2007, there were 1.2 billion young people aged 15–24 worldwide, with an estimated 10 million of these living with HIV. Of these, two-thirds live in sub-Saharan Africa (6.2 million), with 76% of them being women.¹ While youth HIV prevalence differs markedly between regions, women consistently carry a disproportionate burden of HIV infection.² Gender differentials in HIV prevalence and incidence among youth have been observed across sub-Saharan Africa. Female youth are as much as eight times more likely to be HIV infected than their male counterparts.³ A growing body of sub-Saharan African studies connects youths' gender-related socialization and power within relationships to risky sexual behaviour.^{4–7} These studies suggest that adolescents' relationship dynamics are characterized by unequal decision-making between partners, poor communication about sex, lack of anticipation of sex and gender-based differences in the motivation to become sexually involved – for girls, emotional or material support versus physical pleasure and social status for boys.⁵

At the same time, the rollout of antiretroviral therapy (ART) has made it possible for both perinatally HIV-infected infants and sexually HIV-infected youth to live well into adulthood, thereby increasing the number of youth living with HIV (YLH) in dating and sexual relationships. While treatment, care and support programmes are often organized around adult and paediatric medical concerns, the sexual and reproductive health needs of the growing group of YLH may not

be addressed by current programmes.⁸ Understanding the experience of YLH is crucial for the planning and implementation of appropriate clinical care and social support services. For these youth, ART adherence and consistent condom use is critical to prevent dual or recombinant HIV infection and the transmission of HIV to seronegative partners.^{9,10}

In 2005, Rwanda had an HIV prevalence rate of 3% in the general population aged 15–49 years; however, prevalence in urban areas (7.3%) was markedly higher than in rural areas (2.2%).¹¹ Notably, the prevalence in young women aged 15–24 years living in urban areas was 3.9% compared with 1.1% for young men in urban areas. Considering that Rwanda is the most densely populated country in Africa and has a relatively young population, with 43.5% under the age of 15 years, a large percentage of the population has already reached or will reach sexual debut in the coming decade.¹¹ The goals of this study were to determine the demographic and behavioural characteristics of youth patients seeking care in an HIV clinic in Kigali, Rwanda as well as their attitudes towards condoms and condom use, self-efficacy to communicate about and negotiate condom use, knowledge of safer sex practices and HIV transmission, and sources of information on HIV, sexually transmitted infections (STIs) and contraceptives.

METHODS

We conducted a cross-sectional study to characterize adolescent patients receiving care in an urban HIV clinic as part of an effort to determine whether specific reproductive and sexual health needs were being met. This study was approved by the

Correspondence to: Dr Supriya D Mehta
Email: supriyad@uic.edu

Rwandan National Ethics Committee and the Institutional Review Board at the University of Illinois at Chicago. Study participants were identified and recruited from the Women's Equity in Access to Care and Treatment's (WE-ACTx) Centreville and Nyacyonga clinics in Kigali. Eligibility criteria were age 16–24 years and receiving medication or support services from WE-ACTx. Enrolment was based on convenience sampling and was conducted from 21 June to 13 August 2010 at peak clinic hours to maximize recruitment of potentially eligible patients.

Owing to the sensitive nature of the questions, face-to-face interviews for data collection were conducted in a private office at the clinic by eight WE-ACTx specially trained trauma counsellors and nurses in the local language (*Kinyarwanda*). Participants were compensated 500 RWF (~\$0.85) and reimbursed for transportation. Informed consent was obtained from participants aged 18–24 years and those considered emancipated minors. For participants aged 16 and 17, informed consent to participate in the study was sought from the parents/guardians first, followed by assent to participate by the individual adolescent.

Patients were interviewed with a closed-ended survey designed to elicit information on demographics, mode of HIV acquisition, age at HIV diagnosis, sexual risk behaviours, alcohol use, STI history, sexual abuse, sources of information on HIV/STIs and contraception, most consistent and trusted source of information on HIV/STIs and contraception, attitudes towards condoms and condom use, self-efficacy to negotiate condom use and communicate with partners, and knowledge of safer sex practices and pregnancy prevention. Questions regarding attitudes and self-efficacy were adapted from the Kaiser Family Institute's SexSmarts surveys.¹² Questions addressing information sources and knowledge of safer sex practices and pregnancy were modified from a national survey for adolescents commissioned by The National Campaign to Prevent Teen and Unplanned Pregnancy (USA) and based on a theoretical model developed by the Guttmacher Institute.¹³ Surveys were translated into *Kinyarwanda* and pre-tested in separate male and female cognitive group interviews with WE-ACTx peer youth leaders and were modified appropriately.

Statistical analyses were performed using SAS 9.2 (SAS Institute Inc, Cary, NC, USA). Continuous normally distributed data were compared using Student's *t*-tests and non-normally distributed data were compared using the non-parametric Mann-Whitney-Wilcoxon test for categorical data. Categorical data were examined by chi-square or Fisher's exact test when cell counts were less than five.

RESULTS

Of approximately 200 eligible WE-ACTx patients at the time of study, 113 patients were approached to participate in the study, and 107 (94.7%) were enrolled (6 were unavailable for interview because they had left the clinic or did not provide parent/guardian consent). Demographic data are summarized in Table 1 by gender.

Sexual history and sexual risk behaviours

The median age at consensual sexual debut was 17 years (range 10–22) and did not differ significantly for women compared

Table 1 Patient characteristics by gender

	Total sample (N = 107)	Women aged 16–24 years (N = 76), n (%)	Men aged 16–24 years (N = 31), n (%)	P value
Age (years)				
16–19	68 (64%)	43 (57%)	25 (81%)	0.02
20–24	39 (36%)	33 (43%)	6 (19%)	
Lives alone				
Yes	20 (19%)	17 (22%)	3 (10%)	0.13
No	87 (81%)	59 (78%)	28 (90%)	
Lives with (not mutually exclusive)				
One or more parent(s)	53 (61%)	35 (59%)	18 (64%)	
Siblings, no parents	28 (32%)	21 (36%)	7 (25%)	
Friends	10 (12%)	6 (10%)	4 (14%)	
Other(s)*	10 (12%)	6 (10%)	4 (14%)	
Has a child/children				
Yes	18 (17%)	18 (24%)	0 (0%)	<0.01
No	89 (83%)	58 (76%)	31 (100%)	
Median years of schooling (IQR)	6 (4–8)	5 (3–8)	7 (5–8.5)	0.02
Works for a wage				
Yes	25 (24%)	20 (26%)	5 (17%)	0.45
No	81 (76%)	56 (74%)	25 (83%)	
Missing	1			
Median age at HIV diagnosis (IQR)	14 (12–17.5)	14 (12–18)	14 (12–14.5)	0.05
Acquired HIV				
Perinatally	57 (61%)	32 (49%)	25 (93%)	<0.01
Sexually	31 (33%)	29 (44%)	2 (7%)	
Other	5 (5%)	5 (7%)	0 (0%)	
Missing	14			

P values calculated using chi-squared or Fisher's exact test (when cell sizes were less than 5), and Mann-Whitney-Wilcoxon test for continuous variables

IQR = interquartile range

*Other(s) include husband, boyfriend, aunt, cousin, grandmother, godfather, nieces/nephews, sister-in-law, stepmother

with men (Table 2). However, of the 38 sexually active respondents, 30 women (94%) and three men (50%) reported that they believed they started having sex before their friends ($P = 0.02$, data not shown). Most participants reported their first consensual sex partner was a boyfriend/girlfriend or spouse (66% of women and 83% of men, data not shown). Women had a median age difference of nine years at first sex between themselves and their partners, while men had a half-year difference ($P = 0.006$). Over one-fifth (22%) of subjects reported they had felt pressure from a potential and/or current partner to have sex and this did not differ by gender (data not shown). Twenty-one women (66%) and one boy (17%) reported receiving money in exchange for sex. Women who ever engaged in transactional sex were significantly more likely to have more lifetime sexual partners (median of 3.6 versus 1, $P = 0.03$) and more likely to have inconsistent condom use in the past six months (67% versus 20%, $P = 0.13$) (Table 3).

Of the 38 sexually active patients, 22 (58%) reported they had been asked to have sex without a condom. Of the 15 respondents who reported inconsistent condom use in the past six months (as defined as condom use less than always), the most common reasons given were that their partner refused to use or allow them to use a condom (73%), they felt safe without a condom (40%), they wanted to become pregnant or get their partner pregnant (33%), and they did not have a condom (27%). Of the 32 women who were sexually active,

Table 2 Sexual risk behaviours for patients by gender

	Total sample (N = 107)	Women aged 16–24 years (N = 76), n (%)	Men aged 16–24 years (N = 31), n (%)	P value
Consensual sex				
Yes	38 (36%)	32 (42%)	6 (19%)	0.01
No: virgin	59 (55%)	35 (46%)	24 (77%)	
No: forced only	10 (9%)	9 (12%)	1 (3%)	
Forced sex				
Yes	24 (22%)	22 (29%)	2 (6%)	0.01
No	83 (78%)	54 (71%)	29 (94%)	
	Sample, sexually active (n = 38)	Women aged 16–24 years (N = 32), n (%)	Men aged 16–24 years (N = 6), n (%)	P value
Median age at consensual sexual debut (IQR)	17 (15–18)	17 (15–18)	16 (15–17.5)	0.88
Age asymmetry at first sex				
Median age difference (IQR)	7 (3–10)	9 (5–11)	0.5 (–0.75–3.25)	0.01
% ≥ 5 years	25 (66%)	24 (75%)	1 (17%)	0.01
% ≥ 10 years	14 (37%)	13 (41%)	1 (17%)	0.38
Median number of partners				
Lifetime (IQR)	2.5 (1–5)	3 (1–6)	3 (2–4.75)	0.79
Past 6 months (IQR)	1 (0–1)	1 (0–1)	1 (0.25–1)	0.48
Ever offered in exchange for sex (not mutually exclusive)				
A meal/food	12 (32%)	10 (31%)	2 (33%)	0.03
Go out on a date	11 (29%)	10 (31%)	1 (17%)	
Money	22 (58%)	21 (66%)	1 (17%)	
Clothes	9 (24%)	8 (25%)	1 (17%)	
Cell phone, cosmetics, jewelry	12 (32%)	11 (34%)	1 (17%)	
Condom use (past 6 months) (n = 27)				
Always	12 (44%)	10 (43%)	2 (50%)	1.00
Less than always	15 (56%)	13 (57%)	2 (50%)	
Skipped (no sex past 6 months)	11			

P values calculated using chi-squared or Fisher's exact test (when cell sizes were less than 5), and Mann–Whitney–Wilcoxon test for continuous variables
IQR, interquartile range

Table 3 Sexually active female patient characteristics and risk behaviours by transactional sex (n = 32)

	Transactional sex (N = 23), n (%)	No transactional sex (N = 9), n (%)	P value
Characteristics			
Median age (years)	22	20	0.32
Median years of schooling	3	3	0.56
Works for a wage			0.70
Yes	13 (57%)	4 (44%)	
No	10 (43%)	5 (56%)	
Has a child			0.44
Yes	12 (52%)	3 (33%)	
No	11 (48%)	6 (67%)	
Acquired HIV sexually			0.23
Yes	18 (78%)	5 (56%)	
No	5 (22%)	4 (44%)	
Risk behaviours			
Condom use (past 6 months)			0.13
Less than always	12 (67%)	1 (20%)	
Always	6 (33%)	4 (80%)	
Skipped (no sex past 6 months)	5	4	
Median lifetime partners	3.6	1	0.03
Median age at sexual debut (IQR)	16.5	16	0.57
Age asymmetry at first sex			
≥ 5 years	19 (79%)	5 (56%)	0.18
< 5 years	4 (17%)	4 (44%)	

P values calculated using chi-squared, Fisher's exact test (when cell sizes were less than 5), and Mann–Whitney–Wilcoxon test for continuous variables

*Data are median frequency

only 14 (44%) had received condoms and two (6%) had ever received birth control pills from a nurse or doctor. Of the 18 patients who reported drinking alcohol in the past six months, 11 (61%) drank alcohol in the six hours prior to having sex. While 13 (34%) of the 38 active subjects had ever been diagnosed with an STI, and of which four (11%) had been diagnosed with an STI in the past six months, 20 (53%) reported having one or more STI symptoms in the past six months (pain during urination, vaginal or urethral discharge, or a sore on their genitals; data not shown).

Most consistent and trusted of information sources

Even though most subjects (83%) had been receiving medical services from WE-ACTx for more than a year, only just over half (59%) of patients reported that their doctor or nurse was their most consistent source of information on HIV/STIs. However, 85 patients (83%) reported their doctor or nurse was their most trusted source of information on HIV/STIs. Peers and partners were infrequently cited as most trusted information source on HIV/STIs and contraception. The second most frequently cited consistent source of information for HIV/STIs and contraception was the radio (Table 4).

Communication, attitudes and self-efficacy

Overall, self-efficacy was high among respondents. Sixty-eight women (90%) and 24 men (77%) said they would be able to refuse to have sex if their partner does not want to put on a condom or does not want them to put on a condom.

Table 4 Patients' most consistent and trusted sources of information by gender

	Most consistent source on HIV/STI ($P = 0.53$)			Most consistent source on condoms ($P = 0.23$)			Most trusted source on HIV/STI ($P = 0.30$)			Most trusted source on condoms ($P = 0.14$)		
	Total	Women	Men	Total	Women	Men	Total	Women	Men	Total	Women	Men
Doctor, nurse, counsellor	60 (59.4)	42 (57.5)	18 (62.3)	50 (51.6)	40 (56.4)	10 (38.5)	85 (82.5)	63 (85.1)	22 (75.9)	68 (67.3)	53 (72.6)	15 (53.6)
Friends, partner	12 (11.9)	9 (12.3)	3 (10.7)	5 (5.2)	4 (5.6)	1 (3.9)	1 (1.0)	1 (1.4)	0 (0)	3 (3.0)	1 (1.4)	2 (7.1)
TV, radio	19 (18.8)	16 (21.9)	3 (10.7)	34 (35.1)	23 (32.4)	11 (42.3)	7 (6.8)	3 (4.1)	4 (13.8)	21 (20.8)	14 (19.2)	7 (25.0)
Other*	10 (9.9)	6 (8.2)	4 (14.3)	8 (8.3)	4 (5.6)	4 (15.4)	10 (9.7)	7 (9.5)	3 (10.3)	9 (8.9)	5 (6.9)	4 (14.3)
Missing	6			10			4			6		

P values calculated using Fisher exact scores when cell sizes were less than 5

*Other includes the Internet, books, magazines and family

Fifty-seven women (79%) and 22 men (92%) said they are able to correctly use a condom. However, 91 respondents (88%) said that alcohol makes having sex easier and only 30 women (42%) and seven men (30%) said they were able to remember to use a condom after drinking alcohol (data not shown).

The majority of respondents said worrying about transmitting HIV had a lot of influence on their relationships (74% of girls and 77% of boys). Most respondents reported they could afford to buy condoms (65%) and/or had access to free condoms (64%), though 26 participants (40%) reported feeling less pleasure from sex when they or their partner use a condom. Forty-seven women (78%) and 12 men (60%) felt their partner would think they engage in sex with multiple partners if they asked to use a condom. Furthermore, 38 women (54%) and 17 men (63%) felt that using a condom is a sign of not trusting your partner. Overwhelmingly, both women and men (92%) acknowledged that women feel more pressure to engage in sex than men and 85% felt that it was mainly a woman's responsibility to make decisions about using contraceptives (data not shown).

DISCUSSION

While some studies^{14,15} have found a reduction in sexual risk taking among people living with HIV/AIDS (PLWHA) after diagnosis, other studies¹⁶⁻¹⁸ have documented high-risk sexual behaviours among PLWHA who are aware of their sero-status, especially those with partners who are also HIV-positive. Consistent with findings from Obare and Birungi¹⁹ and Birungi *et al.*⁸ regarding YLH in Uganda, and findings from Anand *et al.*²⁰ among PLWHA in Kenya and Malawi, less than half of sexually active respondents in our sample reported consistent condom use in the past six months. Despite relatively high reported self-efficacy to refuse sex without a condom and use a condom correctly, respondents reported some negative attitudes towards condoms and difficulty in negotiating condom use after drinking alcohol. Inconsistent condom use likely explains why roughly half of sexually active respondents reported at least one STI symptom in the past six months. Since all of these patients had been diagnosed with HIV for at least a year, this is objective evidence for ongoing risk of HIV transmission to seronegative partners and risk of HIV super-infection.

The gap between most trusted and most consistent sources of information suggests the need for nurses and counsellors to more proactively provide information on contraception, ask about consistent condom use and discuss its importance, as well as engage younger patients, specifically before sexual

debut, in a dialogue about pressures to engage in sex to help them develop condom negotiation skills. Since more than one-third of participants considered the radio to be their most consistent source of information on condoms, clinics and both the non-profit and government health sectors could consider partnering with radio stations to deliver accurate health messages. To our knowledge, no previous studies in sub-Saharan Africa have measured the most consistent and trusted sources of information on HIV/STIs and contraception among youth engaged in HIV care. This novel measure could be assessed among other samples of youth and the results could be used to inform and increase the reach of sexual health education and intervention campaigns.

Our results demonstrate the high prevalence of sexual partner age asymmetry and transactional sex among female YLH. Young women who have engaged in transactional sex were more likely to have an age asymmetry of five or more years at first sex, a greater number of lifetime sexual partners and inconsistent condom use in the past six months. While we cannot draw causal conclusions, similar to transactional sex, the associated risk factors themselves are also potentially related to power imbalances and resource needs, or possibly desires. Luke⁶ and Leclerc-Madlala²¹ suggest that as economies expand in sub-Saharan Africa there is also a greater occurrence of transactional partnerships as a way to meet a growing list of needs and wants that range from meals and school fees to designer clothes and acceptance among peers. The high rates of forced sex and exchange of sex for material goods or money, particularly with older partners, suggest a great need for mental health support services as well as income generation activities and continued education to increase economic independence among female youth.^{6,21} While the literature focuses on risk of HIV acquisition in relation to intergenerational and transactional sex among young women, this study establishes the prevalence of age and economic asymmetric partnerships among female YLH and the associated risk of HIV transmission to seronegative partners and HIV super-infection.

However, efforts should not target young women alone; rather, as Leclerc-Madlala²¹ advocates, they should include a dual approach that focuses on empowering women while working to change men's attitudes and behaviour. A cohesive national response with the support of community leadership at all levels may help to promote the development of social sanctions against the practice of cross-generational and transactional sex and change how these relationships are perceived.²¹ In June 2010, Rwanda's Ministry of Youth launched the second phase of the 'SINIGURISHA' (I am not for sale) campaign with a new message targeting business leaders, church authorities, police and teachers, after focus group discussions

indicated the need for the entire community to address the prevalence of asymmetric partnerships among youth. In addition to appearing on billboards, the campaign's messages were broadcast in television and radio spots, and publicized during community events.

The findings in our study are subject to limitations. The urban clinic population limits the applications and generalizations that can be made. Youth HIV clinic patients cannot be directly compared with other YLH who might not access care consistently. While this sample reflects the gender ratio of the overall youth clinic population, the sample (77% women) is skewed and does not offer an adequate comparison of men. In an attempt to limit recall bias in this cross-sectional survey, we only assessed condom use in the past six months. Because this was a convenience sample, some clinic patients were not offered enrolment in this study. Patients may not have attended the clinic because they are non-adherent, someone else picks up their medications, or because they did not have a scheduled appointment during the short duration of the study. Non-enrolled patients may have different behavioural characteristics. Results may be subject to social acceptability bias because interviews were conducted in a formal, clinic setting and because interviewers were WE-ACTx staff. Because this study was not designed to identify predictors of sexual risk behaviours, including age asymmetry between partners and transactional sex, the associations identified are only descriptive and suggest further areas for investigation and intervention. The study was limited by the small sample size; nevertheless, our results on sexual risk behaviours are consistent with those of other studies.^{3-6,19}

Owing to the exploratory nature of the study, we did not collect information on age asymmetry at last sex, type of current relationship(s) or ART adherence. In focus group discussions with WE-ACTx peer youth leaders, these YLH considered questions regarding disclosure of HIV status to sexual partners to be a highly sensitive issue and one that they did not feel participants would report truthfully. As a result, we did not ask respondents if they had disclosed their status to their past or current partners, as we did not want to make participants feel unduly distressed. While some studies in South Africa^{22,23} and Uganda²⁴ have shown a correlation between disclosure and a reduction in sexual risk taking, including increased consistent condom use, two systematic reviews^{25,26} showed there was little evidence that withholding disclosure of one's seropositive status from sex partners was associated with risky sexual behaviour. Crepaz and Marks²⁶ hypothesize that non-disclosers may fear negative consequences from disclosing (e.g. refusal to have sex, loss of privacy, stigmatization) but still attempt to be safe with those uninformed partners. Further research should look to address the impact of HIV status on sexual partnerships, ART adherence, and disclosure of HIV status and its effect on consistent condom use as well as the impact of the type of relationship on consistent condom use.

Despite these limitations, this study demonstrates that age and economic asymmetries in sexual relationships may limit the ability of female YLH to negotiate safe sexual practices, which can lead to increased risk of HIV transmission. The link between economic transaction and sexual risk taking described in the literature suggests that female youth are less likely to suggest or demand condom use within these types of partnerships.^{6,7,21,27,28} Some qualitative studies have highlighted the consensual nature of asymmetric relationships,

whereby adolescent girls exercise agency to extract money and gifts from older men in exchange for sex, and may have multiple sexual partners to maximize the benefits of these relationships.⁶ Notwithstanding, qualitative studies indicate the receipt of money and gifts constrain the negotiation of sexual relations and limit the ability of young women to negotiate safe sex in transactional partnerships because the money, gift or favour offered by the man enables him to dictate the context and dynamic of the sexual encounter.²⁸ Further research needs to account for the possible self-selection of individuals into asymmetrical relationships, whereby young women who are independently more likely to engage in risky behaviours and experience poor health outcomes choose older partners or take an active role in seeking transactional relationships.⁶

Given the need to prevent HIV transmission and superinfection and reduce the high prevalence of sexual risk behaviours, a case emerges for intensified and youth-focused services for YLH in sub-Saharan Africa. Considering the majority of patients reported their health-care provider was their most trusted source of information on HIV/STIs and condoms, yet only about half reported receiving consistent information from them, physicians and nurses should more routinely discuss the importance of consistent condom use with YLH. With the training and support of peer youth leaders, counsellors and nurses associated with WE-ACTx, a feasible intervention would include enhancing girls' communication skills about the expectations and intentions of such transactions and building condom negotiation skills. Ultimately, empowerment alone may not be enough when obtaining financial and material resources is the driving factor in the establishment of relationships defined by age and economic asymmetries.

ACKNOWLEDGEMENTS

The authors would like to thank the following for their support and input at different points during the study period: Dr Eugene Mutimura, WE-ACTx Director of Research; Chantal Benekigeri, WE-ACTx Clinical Director; interviewers and WE-ACTx trauma counsellors and nurses: Anne Marie Bamukunde, Bernadette Bizimana, Alice Umutesi, Josee Gasana, Rose Kagatu, Dominique Mujawimana, Betty Uwitonze, Francine Umwiza; WE-ACTx staff/volunteers Henriette Byabagamba, Bertin Mulimda, Constantine Muhire and Nadia; all the WE-ACTx peer youth leaders and youth who participated in cognitive group interviews and the study respectively. This research was made possible by funding from the Douglas Passaro Global Horizons Fund and University of Illinois at Chicago School of Public Health Global Health Initiative.

Conflicts of interest: None declared.

REFERENCES

- 1 Wilson CM, Wright PF, Safrit JT, *et al.* Epidemiology of HIV infection and risk in adolescents and youth. *J Acquir Immune Defic Syndr* 2010;**54**:S5-6
- 2 Chapman R, White RG, Shafer LA, *et al.* Do behavioural differences help to explain variations in HIV prevalence in adolescents in sub-Saharan Africa? *Trop Med Int Health* 2010;**15**:554-66
- 3 Global report: UNAIDS report on the global AIDS epidemic. 2010. See http://www.unaids.org/globalreport/Global_report.htm (last checked 10 December 2011)
- 4 Kelly RJ, Gray RH, Sewankambo NK, *et al.* Age differences in sexual partners and risk of HIV-1 infection in rural Uganda. *J Acquir Immune Defic Syndr* 2003;**32**:446-51

- 5 Varga CA. How gender roles influence sexual and reproductive health among South African adolescents. *Stud Fam Plann* 2003;**34**:160–72
- 6 Luke N. Age and economic asymmetries in the sexual relationships of adolescent girls in sub-Saharan Africa. *Stud Fam Plann* 2003;**34**:67–86
- 7 Hargreaves JR, Morison LA, Kim JC, et al. Characteristics of sexual partnerships, not just of individuals, are associated with condom use and recent HIV infection in rural South Africa. *AIDS Care* 2009;**21**:1058–70
- 8 Birungi H, Mugisha JF, Obare F, Nyombi JK. Sexual behavior and desires among adolescents perinatally infected with human immunodeficiency virus in Uganda: implications for programming. *J Adolesc Health* 2009;**44**:184–7
- 9 Moore AR, Oppong J. Sexual risk behavior among people living with HIV/AIDS in Togo. *Soc Sci Med* 2007;**64**:1057–66
- 10 Hammer S. Antiretroviral treatment as prevention. *N Engl J Med* 2011;**365**:561–2
- 11 Institut National de la Statistique du Rwanda, ORC Macro. *Rwanda Demographic and Health Survey 2005*. Calverton, MD: INSR and ORC Macro, 2005
- 12 The Kaiser Family Institute. *Sex Smart Surveys*. See <http://www.kff.org/entpartnerships/seventeen/index.cfm> (last checked 15 May 2011)
- 13 Kaye K, Suellentrop K, Sloup C. *The Fog Zone: How Misperceptions, Magical Thinking, and Ambivalence put Young Adults at Risk for Unplanned Pregnancy*. Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy, 2009
- 14 Allen S, Meinen-Derra J, Kautzman M, et al. Sexual behavior of HIV discordant couples after HIV counseling and testing. *AIDS* 2003;**17**:733–40
- 15 Marks G, Crepaz N, Senterfitt JW, et al. Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: implications for HIV prevention programs. *J Acquir Immune Defic Syndr* 2005;**39**:446–53
- 16 Bell DC, Atkinson JS, Mosier V, et al. The HIV transmission gradient: relationship patterns of protection. *AIDS Behav* 2007;**11**:789–811
- 17 Golden MR, Wood RW, Buskin SE, et al. Ongoing risk behavior among persons with HIV in medical care. *AIDS Behav* 2007;**11**:726–35
- 18 Kalichman SC. HIV transmission risk behaviors of men and women living with HIV/AIDS: prevalence, predictors, and emerging clinical interventions. *Clin Psychol* 2000;**7**:32–47
- 19 Obare F, Birungi H. The limited effect of knowing they are HIV-positive on the sexual and reproductive experiences and intentions of infected adolescents in Uganda. *Pop Stud* 2010;**64**:97–104
- 20 Anand A, Shiraishi RW, Bunnell RE, et al. Knowledge of HIV status, sexual risk behaviors and contraceptive need among people living with HIV in Kenya and Malawi. *AIDS* 2009;**23**:1565–73
- 21 Leclerc-Madlala S. Age-disparate and intergenerational sex in southern Africa: the dynamics of hypervulnerability. *AIDS* 2008;**22**(Suppl. 4):S17–25
- 22 Wong LH, Rooyen HV, Modiba P, et al. Test and tell: correlates and consequences of testing and disclosure of HIV status in South Africa. *JAIDS* 2009;**50**:215–22
- 23 Simbayi LC, Kalichman SC, Strebel A, et al. Disclosure of HIV status to sex partners and sexual risk behaviours among HIV-positive men and women, Cape Town, South Africa. *Sex Transm Infect* 2007;**83**:29–34
- 24 King R, Katuntu D, Lifshay J, et al. Processes and outcomes of HIV serostatus disclosure to sexual partners among people living with HIV in Uganda. *AIDS Behav* 2008;**12**:232–43
- 25 Simoni JM, Pantalone DW. Secrets and safety in the age of AIDS: does HIV disclosure lead to safer sex? *Top HIV Med* 2004;**12**:109–18
- 26 Crepaz N, Marks G. Towards an understanding of sexual risk behavior in people living with HIV: a review of social, psychological, and medical findings. *AIDS* 2002;**16**:135–49
- 27 Kaufman CE, Stavrou SE. *Bus Fare Please: The Economics of Sex and Gifts among Adolescents in Urban South Africa*. Research Division Working Paper No. 166. New York: The Population Council, 2002
- 28 Wagman J, Baumgartner JN, Geary CW, et al. Experiences of sexual coercion among adolescent women: Qualitative findings from Rakai District, Uganda. *J Interpers Violence* 2009;**24**:2073–95

(Accepted 29 December 2011)