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## SEXUAL BEHAVIOUR AMONG PERSONS LIVING WITH HIV / AIDS IN KAMPALA, UGANDA

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## SEXUAL BEHAVIOUR AMONG PERSONS LIVING WITH HIV/AIDS IN KAMPALA, UGANDA

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### ABSTRACT

**Objective:** To identify sexual behaviour and reproductive health needs of people living with HIV/AIDS (PLWHAs).

**Design:** A cross sectional study.

**Setting:** Joint Clinical Research Centre, Kampala Uganda.

**Participants:** Three hundred and eighty PLWHAs, 50% of whom had initiated anti-retro viral therapy (ART).

**Main outcome measures:** PLWHAs answered questions regarding sexual behaviour, number and type of sexual partners, symptoms of sexually transmitted infections, having been pregnant or causing a pregnancy, social demographic characteristics, consumption of alcohol, having biological children, desire for more children and use of condoms.

**Results:** In the past 12 months 227 (60%) of the PLWHAs were sexually active. Of the sexually active 42 (19%) never used a condom, and 92 (40%) used condoms inconsistently, thus 134 (35%) of PLWHAs engaged in high risk sex. Two hundred and sixty five (70%) said that PLWHAs can have healthy children and 115 (30%) desired more children with 21 (10%) of the women in the reproductive age group reporting a pregnancy and 22 (17%) of the men reporting having caused a pregnancy. Only three (7%) of the pregnancies were unplanned. Desire for more children was a strong independent predictor of engaging in high risk sex (Adjusted Odds Ratio 2.44, 95% CI 1.35-4.42).

**Conclusions:** This study demonstrates that abstinence and use of condoms on their own may not be enough for HIV prevention among PLWHAs who desire children. Additional methods such as use of ART to reduce HIV infectiousness and sperm washing are needed.

### INTRODUCTION

Most prevention strategies with the Human Immunodeficiency Virus (HIV) have been aimed at uninfected people to prevent them from becoming infected with HIV. People living with HIV / AIDS (PLWHAs) who are now estimated at 40 million globally are however important in prevention of HIV infection (1). The positive prevention strategy which aims to assist PLWHAs to take measures to avoid the possibility of exposing others to infection is currently of considerable interest. The reasons for this interest are several. First PLWHAs have sex and a high proportion of them ranging from 10-60% continue to engage in unprotected sexual behaviours that place their partners at risk for infection and place themselves at risk for super infection with HIV and other sexually transmitted infections (STIs) (2). Second,

the widespread use of anti-retroviral therapy (ART) improves the quality and sexual lives of PLWHAs. Although current evidence suggests that use of ART among HIV-positive individuals does not necessarily increase high risk sex among HIV-positive individuals (3), high risk sexual behaviour within the population among people who do not know their HIV status and among the HIV-negative is common (4). Third PLWHAs get to grips with the complex ethical issues such as disclosure, having children and minimising of transmission of HIV to their sexual partners as well as their children (1, 5). Fourth from an epidemiological and public health perspective, PLWHAs are deemed the most important group to address with prevention strategies for HIV and other sexually transmitted infections (STIs). Preventive interventions with PLWHAs are likely to have a greater impact on the HIV epidemic, for an equivalent input of cost, time,

resources, than preventive interventions focused on HIV negative individuals. A change in the high risk sexual behaviour of a HIV positive person will, on average and in almost all affected populations, have a much bigger effect on the spread of the virus than an equivalent change in the behaviour of a negative person (6). Sero-discordant couples are a particularly important group to support, as are infected pregnant women who are at risk of transmitting HIV to their infants (5). Finally from a human rights perspective, PLWHAs have a right to live well with HIV, which includes having a healthy sex life (1). This requires strategies that support people with HIV to protect their sexual health, to avoid new STIs to delay HIV/AIDS disease progression and to protect PLWHAs HIV from re-infection or super-infection (7).

PLWHAs have specific prevention requirements that demand tailored communications or service delivery strategies. For instance, PLWHAs have the right to information to support their choices on whether to have children or not. The challenge is how to meet these specific needs without increasing stigma and discrimination. It has been stressed that involving PLWHAs in decision making for positive prevention is of paramount importance and probably the best way to approach positive prevention (8). Understanding the sexual behaviour and reproductive choices of PLWHAs is the first step towards greater involvement of PLWHAs in positive prevention (1,8). More information is needed regarding sexual behaviour, reproductive choices and involvement of PLWHAs in positive prevention especially in low income countries of sub-Saharan Africa with the greatest burden of HIV/AIDS. This study aimed to identify sexual behaviour among PLWHAs in care in Kampala, the capital city of Uganda.

## MATERIALS AND METHODS

The study was carried out in Kampala, Uganda at the Joint Clinical Research Centre (JCRC). The JCRC is a specialised medical institution for HIV/AIDS research and health care that was established in 1991. In 1996 the JCRC pioneered the use of ART in Uganda and has cumulatively provided anti-retroviral (ARV) drugs to more than 40,000 PLWHAs. More than 80% of the PLWHAs attending for care at JCRC receive all services free of charge. HIV/AIDS patients who are not medically eligible for ART are provided basic health care including provision of cotrimoxazole prophylaxis, diagnosis and treatment of sexually transmitted infections, clinical screening for tuberculosis and prevention with positives strategy that includes provision of condoms and risk-reduction counselling. Referral is also provided to other health units for services not offered at the centre.

*Design:* In a cross section study, we interviewed a consecutive random sample of 190 PLWHAs who

had initiated ART (ART experienced) and 190 PLWHAs who had not initiated ART (ART naive) attending for care at the JCRC from 5<sup>th</sup> March to 4<sup>th</sup> April 2007. The sample size was enough to detect the predictors of high risk sexual behaviour with a power of at least 80%, a 95% confidence interval (95% CI) with an odds ratio of 2.5 if the prevalence of high risk sexual behaviours and of their predictors ranged between 10-80% in the study population. This sample was arrived at using epiinfo version 6 statcal for cross sectional studies using being ART naive or ART experienced as reference predictor variable. In order to be included for the interview, PLWHAs had to be in care for at least 12 months and be above 18 years of age. PLWHAs answered questions regarding sexual behaviour, number and type of sexual partners, symptoms of STIs (urethral discharge, genital ulcer, low abdominal pain or vaginal discharge), having been pregnant or causing a pregnancy, social demographic characteristics, consumption of alcohol, having biological children, desire for more children and use of condoms. The dependent variable was engagement in high risk sex or not (high risk sex was defined as having had sex with a regular or non regular partner without a condom in the last 12 months).

*Selection of study participants:* We aimed to include equal number of ART experienced and ART naive PLWHAs because we needed adequate numbers to be able to analyse the effect of exposure to ART on high risk sexual behaviour. Systematic sampling was used to select participants for this study. Adult monthly attendance at the JCRC Kampala site is about 6840 HIV/AIDS patients (5696 ART experienced and 1144 ART naive). Of these, 4902 (ART experience) have taken ART and 994 (ART naive) were on prophylactic treatment for at least 12 months. Lists of PLWHAs are generated from the database separately for ART experienced or ART naive and these lists constitute the sampling frames. The PLWHAs come to JCRC for monthly reviews and drug refills and the clinic runs five days a week (Monday to Friday). In the database, each patient is given a code number. The database contains information for identification, records of treatment, date of initiation of care and dates of next visit. Daily attendance was 223 PLWHAs for ART experienced and 45 for the ART naive. We aimed to interview at least nine ART naive or experienced PLWHAs daily so every 25<sup>th</sup> ART experienced and every 5<sup>th</sup> ART naive patient was eligible for inclusion. Since the dates of review for each patient were on record, selected patients were interviewed on the specific dates of appointment in the outpatient clinic on a daily basis as they came in for their monthly scheduled visits. Patients who were selected but failed to report on their specific days, were tracked on subsequent days. Patients who refused the interview (about 2%) were excluded.

*Data collection and analysis:* Data was collected by trained research assistants supervised by one of the principal investigators (DT). A standardised pre-tested interview schedule with both structured and semi-structured questions was used to collect the data. At the end of each day, data collected was sorted, checked for consistency and for completeness. After all data had been collected, it was entered into EpiData software version 2.1 b (EpiData Association, Odense, Denmark) and exported to STATA 8.2 (StataCorp LP) for analysis. The analysis included generation of frequencies, cross tabulations to investigate associations between various variables and engagement in high risk sex and binary logistic regression analysis to identify independent predictors of engagement in high risk sex. At the bivariate level, the associations of dichotomous variables were assessed by use of chi square ( $X^2$ ) or Fischer's exact test and by use of crude odds ratios (COR) and their corresponding 95% confidence interval (95% CI). Continuous variables were compared using F-ratios. All variables that were found significantly associated with high risky sexual behaviours from bivariate analysis were included in the binary logistic regression model using backward likelihood ratio method to generate a model to explain engaging in high risk sex. Before the logistic regression the variables were tested for multi-co linearity. The adjusted odds ratios (AOR) and the 95% CI were then estimated for variables that remain significant after the logistic regression. In all the analysis a  $P < 0.05$  was used as test for significance.

*Ethical considerations:* The study was approved by the Makerere University School of Public Health institutional review board and by the Uganda

National Council of Science and Technology. Informed consent was sought from each participant before the interview and confidentiality was ensured.

## RESULTS

Of the 380 patients, 37% had been in care for less than 24 months, 40% for between 24 and 36 months whereas 23% had been in care for more than 36 months. About a third of the PLWHAs (127 of 380) were men with no difference in the percent of men between ART experienced and ART naïve groups (34% versus 33%). The age range was 18-73 years with median age of 40 years and standard deviation of 10 years. Women were younger (mean age 36 years versus 41 years) than men (F-ratio 22.63, 379 degrees of freedom [df],  $P < 0.001$ ). Most of the respondents (53%) had attained secondary education, 35% were married, 35% were widowed, 48% unemployed and 35% earned less than 30 United States dollars per month (about 50,000 Uganda shillings). Women (39% versus 25%) were more likely to be widowed than men ( $X^2 = 6.66$ ,  $P = 0.01$ ). The median CD4 count of the respondents was 317 cells/mm<sup>3</sup> with inter-quartile range (IQR) of 154 and ranges 61-853 cells/mm<sup>3</sup> 48 (13%) had CD4 counts of less than 200, 175 (48%) had CD4 counts between 201 and 349 whereas 149 (39%) had a CD4 count of more than 350 cells/mm<sup>3</sup>. There were no differences between ART experienced and ART naïve regarding sex, educational level, religion, residence and occupation. However the ART experienced were more likely to be older, widowed and to have a higher income (Table 1).

**Table 1**  
*Socio-demographic characteristics among ART experienced and ART naïve PLWHAs*

Variable	ART Experienced		ART Naïve		$X^2$ (df)	P-value
	Frequency	(%)	Frequency	(%)		
<b>Sex</b>						
Male	64	34	63	33	0.00 (1)	1.00
Female	126	66	127	67		
<b>Age in years</b>						
18-30	25	13	70	37	45.19 (3)	0.001
31-40	93	49	82	43		
41-50	64	34	22	12		
≥50	8	4	16	8		
<b>Education level</b>						
None	8	4	18	9	4.43 (3)	0.21
Primary	59	32	55	29		
Secondary	92	48	91	48		
Tertiary	31	16	26	14		

Religion						
Catholic	75	40	78	41		
Protestant	55	29	68	36		
Moslem	23	12	24	12	6.52 (3)	0.09
Others	37	19	20	11		
Marital status						
Single	17	9	35	20		
Married	68	36	65	34		
Divorced/Separated	28	14	35	18	11.50 (3)	
Widowed	77	41	53	28		0.009
Occupation						
Unemployed	48	25	49	26		
Peasant	31	16	39	21		
Business	67	35	72	38	3.42 (3)	0.33
Civil servant	43	24	30	16		
Income (Uganda shillings per month)*						
No income	59	31	67	35		
< 50,000	66	35	67	35		
50,000 - 99,999	10	5	21	11		
100,000 - 199,999	18	9	15	8		
200,000 - 299,999	12	7	11	6	16.01	
≥ 300,000	25	13	9	5	(5)	0.007
Residence						
Rural	88	46	77	41	1.07 (1)	0.30
Urban	102	54	113	59		

df are degrees of freedom

\* 1 US Dollar = 1666 Ugandan Shillings

*Sexual behaviour within the past 12 months:* Of the 380 study respondents 227 (60%) reported sexual activity in the last 12 months. Of the sexually active 92 (40.5%) were inconsistent users of condoms and 42 (18.5%) never used a condom. Thus 134 (35.3%) of the PLWHAs engaged in high risk sex (did not abstain, were inconsistent condom users or never used a condom). The ART naive 79/190 were more likely to engage in high risk sex than ART experienced 55/190 ( $\chi^2 = 6.10$ ,  $P = 0.013$ ). Women (49% versus 24%) were more likely to abstain from sex compared to men ( $\chi^2 = 21.57$ ,  $P < 0.001$ ). However, there was no difference between men and women (51% versus 49%) regarding the consistency of condom use.

Of the 380 respondents, 89 (23%) reported at least one symptom of an STI. Among the men, the reported symptoms were urethral discharge by 20 (16%), genital ulcer by 16 (13%) and other symptoms by 10 (8%). Among the women, 54 (21%) reported vaginal discharge, 31 (12%) reported genital ulcers and 15 (6%) reported low abdominal pain.

Twenty one (10%) of the women in the reproductive age group reported having been pregnant, and 22 (17%) of the men reported having impregnated someone. Only three (7%) of the pregnancies (one among women and two among those caused by men) were reported to be un-wanted or unplanned. Of all the respondents, 115 (30%) desired more children and 265 (70%) said that an HIV positive individual can have healthy children.

As seen in Table 2, the ART experienced were more likely than the ART naive to have used condoms consistently, know the spouse or regular partner's HIV status, but less likely to have never used or used condoms inconsistently. On the other hand there were no differences between ART experienced and ART naive patients regarding being sexually active, having had sex with a non-regular partner, having disclosed HIV status to spouse or regular partner, reporting of STI symptoms, being pregnant or causing a pregnancy, desiring more children and saying that PLWHAs can have healthy children.



**Table 2**  
*Sex and reproductive behaviour in the past 12 months among ART experienced and ART naïve PLWHAs*

Variable	ART experienced		ART Naive		X <sup>2</sup> (df)	P-value
	No.	(%)	No.	(%)		
Sexual activity in previous 12 months						
Sexually active	110	58	117	62	0.39 (1)	0.530
Sex with non-regular partners	42	38	48	41	0.36 (1)	0.546
Condom use among the sexually active (n=227)						
Consistent	55	56	38	43		
Inconsistent	40	44	52	57		
Never	15	14	27	23	7.89 (2)	0.019
Disclosed HIV status to spouse/regular partner n=227						
	94	85	90	77	5.34 (1)	0.21
Know spouse or regular partner's HIV status (n= 227)						
	92	83	66	56	24.77 (1)	< 0.001
Consequences of engaging in high risk sexual behaviour (n=380)						
Reported STI symptoms	45	24	44	23	0.00 (1)	1.00
Became pregnant (women < 50 years)	13	12	8	8	0.69 (1)	0.408
Caused pregnancy (men)	11	16	11	19	0.05 (1)	0.831
Reproductive health desires and beliefs (n=380)						
Desire more children	55	29	60	32	0.20 (1)	0.655
HIV + can have healthy children	137	72	128	67	0.80 (1)	0.372

For column four numbers in brackets are degrees of freedom (df)

*Risk factors for engaging in high risk sexual behaviour:* The results of the bivariate analysis are shown in Tables 3 and 4. Table 3 shows that being: ART naïve, 31-50 years, male, married, employed, a Muslim, in care for < 24 months and drinking of alcohol increased the chance of engagement in high risk sexual behaviour.

**Table 3**  
*Socio-economic factors associated with high risk sexual behaviour in the last 12 months among PLWHAs with corresponding crude odds ratios (COR) and 95% confidence intervals (95% CI)*

Variable	Low /No risk (n=134)	High risk (n=246)	COR	95% CI
ART experience				
Experienced	55	135	1.0	
Naïve	79	111	1.75	1.12-2.74
Age-group (years)				
> 50	15	68	1.0	
41-50	50	97	2.34	1.16-4.75
31-40	61	62	4.46	2.20-9.14
<30	8	19	1.91	0.63-5.75
Sex				
Female	80	173	1.0	
Male	54	73	1.60	1.01 - 2.55
CD4 Count (cells/mm <sup>3</sup> )				
200 and below	18	30	1.0	
201 - 349	62	121	0.85	0.42 - 1.74
350 and above	54	95	0.95	0.46 -1.96

Marital status				
Married	73	60	3.71	2.31- 5.95
Not married	61	186	1.0	
Education status				
Some	127	227	1.52	0.58-4.10
None	7	19	1.0	
Employment status				
Employed	85	128	1.60	1.02 -2.52
Not employed	49	118	1.0	
Monthly income (Uganda shillings)				
More than 50,000	51	70	1.54	0.97 -2.47
50,000 and below	83	176	1.0	
Religious affiliation				
Muslem	26	21	2.58	1.33-5.01
Christian	108	225	1.0	
Duration of care (months)				
<24	77	65	3.67	1.95-6.94
25-36	48	104	1.43	0.75-2.72
> 36	21	65	1.0	
Drinks alcohol				
Yes	48	51	2.13	1.30 - 3.50
No	86	195	1.0	

\*1 US Dollar = 1666 Ugandan Shillings

**Table 4**

*Association between engagement in high risk sexual behaviour with desire for children and beliefs towards children and use of condoms, and corresponding crude odds ratios (COR) with their 95% confidence interval (95% CI)*

Variable	Low /No risk (n=134)	High risk (n=246)	COR	95%CI
Desires more children				
Yes	55	60	2.16	1.34 - 3.47
No	79	186	1.0	
Has biological children				
Yes	126	221	1.78	0.74 - 4.44
No	8	25	1.0	
PLWHAs can have healthy children				
Agree	96	168	1.17	0.72 - 1.91
Disagree	38	78	1.0	
Condoms reduce sexual pleasure				
Agree	52	52	2.37	1.45 - 3.86
Disagree	82	194	1.0	
Condoms not suitable for some sexual styles				
Agree	43	53	1.72	1.04 - 2.84
Disagree	91	193	1.0	
No need to use condoms if HIV positive				
Agree	13	15	1.65	0.71 - 3.82
Disagree	121	231	1.0	

Education status, monthly income and CD4 cell count appeared not to influence engagement in high risk sexual behaviour. As seen in Table 4 engagement in high risk sexual behaviour was increased by having desired more children, agreeing that condoms reduced sexual pleasure and saying that condoms were not suitable for some sexual styles. On the other hand, having biological children saying that HIV positive people needed not to use condoms and agreeing that PLWHAs could have healthy children did not influence engagement in high risk sexual behaviour.

*Independent predictors of engaging in high risk sexual behaviour.* The independent predictors of engaging in high risk sex included: being between 31 and 50 years of age (AOR 2.21, 95% CI 1.12-4.14), being married (AOR 3.91, 95% CI 2.33-6.56), drinking of alcohol AOR 1.89, 95% CI 1.08-3.34, desiring more children (AOR 2.44 95% CI 1.35 - 4.42) and saying that condoms reduced sexual pleasure AOR 2.29, 95% CI 1.30-4.05).

The model with these five variables was statistically reliable (goodness of fit  $X^2=13.04$ , 8 df,  $P=0.11$ ), indicating that the predictors, as a set, reliably distinguished between PLWHAs who engaged in high risk sexual behaviours and those who did not. Variables that were significant on bivariate analysis but did not reach significance on binary logistic regression were: sex, religion, ART experience, employment status, duration in care, and saying that condoms are not suitable for some sexual styles.

## DISCUSSION

This study found that about one in three of PLWHAs engaged in high risk sexual behaviours and that about 23% of PLWHAs reported symptoms of an STI. These findings are particularly worrying for transmission of HIV. Having an STI can increase the risk of passing HIV onto a partner through sex (9). Although there is growing evidence that people with HIV get re-infected and or super-infection with another 'strain' of HIV, including drug-resistant strains (10), this is thought not to be of major public health significance (3, 11). There is also increased chance that those who become pregnant are likely to transmit the HIV by mother to child transmission (MTCT) (11).

Our data is in agreement with previous research that use of ART at individual level does not necessarily increase high risk sex (3,12). Moreover ART by diminishing the viral load in an individual on treatment greatly decreases the probability of sexual as well as mother to child transmission of HIV (11).

However these advantages of ART at individual level are not necessarily replicated at population level. More than 80% of the people who are HIV infected in Uganda and other low income countries have never had HCT and since they do not know their

HIV status they are not motivated to use protective measures (13). More so, only 20% of the PLWHAs who are eligible for ART in low income countries are actually on treatment (14), meaning that the majority of PLWHAs do not benefit from the use of ART including the reduced transmission of HIV to sexual partners. Furthermore, concerns that widespread availability of ART may cause dis-inhibition in the general population leading to increase in high risk sexual practices by removing the fear of death from AIDS are indeed still real (15).

Previous studies are also in consonance with our findings implicating use of alcohol (16) and being married (17) as a predictor of high risk sexual behaviour. Findings in this study pointing to the expressed need for PLWHAs to have children could explain why high risk sexual behaviour may be more common among married couples. Where the cultural pressure among married people is to have children as is the case in Uganda, condom use (which is a contraceptive) and sexual abstinence may be unrealistic as positive prevention strategies where conception is desired (17).

An explanation is warranted as to why PLWHAs aged 31-50 years are at increased chance of engaging in high risk sex. A possible reason is that people of this age group are at increased pressure to have a child (before 30 years, there is still time to have a child, and those above 50 years have probably already had one). However in this study both age and desire for children were tested in a multivariate logistic regression and both emerged significant. Thus if the effect of age was being mediated through desire for children, age would not be significant in the final regression model. Thus age and desire for children both being significant could be because PLWHAs in this study underreported their desire for children since this is the most socially desirable answer (18).

While interpreting this data it is important to know that this represents a highly selected population of PLWHAs who knew their HIV status and were in care in a centre of excellence like the joint clinical research centre. These data may therefore not be applicable to other PLWHAs who do not know their HIV status or are not in care. Indeed one of the problems of HIV prevention with positives is that about 80% of the PLWHAs do not know their HIV status as they have never had HIV counselling and testing (HCT) (13). This study was limited to PLWHAs who sought care at one urban centre. PLWHAs who seek care elsewhere (especially in rural areas) may be different from this sample. Furthermore, sexual behaviour was assessed with self-report. Although self-report is commonly used in Uganda and other low income countries for most analyses concerning sexual behaviour (4), there is evidence that self-report may indeed underestimate high risk sexual behaviours (18).

*Implication for interventions:* The data suggests that PLWHAs have reproductive needs like desiring more children. However, the most common messages for HIV prevention in this population are sexual abstinence or consistent use of condoms. Yet, evidence from literature implies that a condom which is contraception may not be an appropriate HIV prevention tool PLWHAs who desire children (17). Additional methods of HIV prevention such as using of ART to reduce infectiousness of PLWHAs (19) that could allow conception are needed for prevention with positives. Another method used in high income countries to enable PLWHAs have children is sperm washing a term used to describe the process in which sperms are separated from the seminal fluid by spinning in a centrifuge. The sperms are then used in intrauterine insemination or *in vitro* fertilization (20). Sperm washing has been developed for couples who wish to have a child, where the male is HIV-positive and the female is HIV-negative. The procedure reduces the risk of HIV transmission to the female partner and subsequently the unborn child because HIV infected material is carried primarily in the seminal fluid rather than in the sperm itself. There is need to evaluate these methods for safety and feasibility among PLWHAs especially in low income settings.

Because PLWHAs who are either ART naïve or ART experienced become pregnant these data suggest that both primary and secondary measures aimed at preventing the spread of HIV from mother to child (PMTCT) services should be given priority. These data also suggest that treatment and control of STIs should deserve utmost attention among PLWHAs as about a quarter of PLWHAs reported symptoms related to an STI within the previous year and STI symptoms make it more likely to transmit and acquire HIV infection. Our data also has further suggestions for targeting of services for positives prevention. High risk sexual behaviour was common among PLWHAs groups mainly those between 31-50 years of age, the married and those who drink alcohol. These variables could be incorporated in risk-reduction counselling to identify PLWHAs who require intense counselling. In order for all these interventions to have impact at the population level, there is need for increasing access to HCT so that the majority of the people are aware of their HIV status and that of their sex partners (13). There is also a strong need for integration of prevention with care (1,7) and to emphasize the correct and consistent use of condoms especially among discordant couples.

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