



OPEN ACCESS

Factors associated with condom use among men and women living with HIV in Lilongwe, Malawi: a cross-sectional study

Lisa B Haddad,¹ Jennifer H Tang,^{2,3} Jamie Krashin,³ Wingston Ng'ambi,⁴ Hannock Tweya,⁴ Bernadette Samala,⁴ Jane Chiwoko,⁴ Thomas Chaweza,⁴ Mina C Hosseinipour,² Eva Lathrop,¹ Denise J Jamieson,¹ Sam Phiri^{4,5}

¹Department of Gynecology and Obstetrics, Emory University School of Medicine, Emory University, Atlanta, Georgia, USA

²UNC Project-Malawi, Kamuzu Central Hospital, Lilongwe, Malawi

³Department of Obstetrics and Gynecology, University of North Carolina School of Medicine, University of North Carolina, Chapel Hill, North Carolina, USA

⁴Kamuzu Central Hospital, The Lighthouse Trust, Lilongwe, Malawi

⁵Department of Medicine, University of North Carolina School of Medicine, Chapel Hill, North Carolina, USA

Correspondence to

Dr Lisa B Haddad, Department of Gynecology and Obstetrics, Emory University School of Medicine, Atlanta, GA 30303, USA; lbhadda@emory.edu

Received 12 May 2017

Revised 11 October 2017

Accepted 25 October 2017

ABSTRACT

Background Understanding the influences on condom use among men and women living with HIV is critical to tailoring sexually transmitted infection/HIV prevention efforts.

Methods This is a sub-analysis of a cross-sectional survey including 255 women and 220 men who were sexually active, HIV-positive, and attending HIV care visits in Lilongwe, Malawi. We estimated adjusted prevalence ratios (aPRs) to evaluate for factors associated with consistent condom use (always using condoms in the past month) and use at last coitus for men and women in separate models.

Results Among women: 38% and 55% reported consistent condom use and condom use at last coitus, respectively. For women, consistent use and use at last coitus were positively associated with the ability to refuse sex without condoms and shared decision-making compared with making the decision alone regarding condom use, and negatively associated with desire for children in the future. Consistent use also increased with longer antiretroviral therapy (ART) use (≥ 1 year compared with no ART use). Among men: 51% and 69% reported consistent condom use and condom use at last coitus, respectively. For men, the ability to refuse sex without condoms was associated with consistent use and use at last coitus, and believing that condoms should be used with other contraception was associated with consistent use.

Conclusions Our findings demonstrate ongoing low condom utilisation among HIV-positive individuals, and highlight that ART and contraceptive use do not deter condom use. Efforts to increase condom utilisation must recognise individual-level factors that influence use and should focus on relationship dynamics and promotion of empowerment and self-efficacy.

Key messages

- ▶ Contraceptive use among men and women living with HIV in Malawi remains poor.
- ▶ Condom use is influenced more by relationship dynamics, fertility intention and self-efficacy than perception of infection or transmission risk.
- ▶ Contraceptive and antiretroviral use does not deter condom use.

INTRODUCTION

Despite significant progress over the past decade to reduce HIV transmission through increased availability of HIV testing, improved access to and utilisation of antiretroviral therapy (ART) and interventions to prevent maternal-to-child transmission (PMTCT), condoms continue to be under-utilised.¹ Correct and consistent condom use can reduce HIV transmission risk by 80%.² Condoms have been promoted among high-risk and HIV-positive individuals with limited success,³ despite recognition of their efficacy in reducing HIV, and prior to the last decade, their status as the principal biomedical intervention for prevention. Low utilisation of condoms has been associated with cost, religious ideology, alcohol or drug use, younger sexual debut, poor knowledge of HIV/AIDS, beliefs of diminished sexual pleasure and male emotional fulfilment, disbelief in prevention efficacy, distrust in relationships, gender inequality and perceptions of modesty.⁴

People living with HIV can now live longer and healthier lives on ART, and as



CrossMark

To cite: Haddad LB, Tang JH, Krashin J, et al. *BMJ Sex Reprod Health* 2018;**44**:42–53.

their life experiences change, their sexual behaviours, fertility desires and perceptions of condom need may also shift. Malawi has one of the highest HIV prevalence rates in the world at 10.6%.⁵ Malawi has achieved great success in curbing the HIV epidemic, demonstrating a declining incidence of HIV of approximately 35% from 2009 to 2012.⁶ Although condoms are freely distributed at ART clinics and educational messaging is integrated into clinic visits, consistent condom use has remained poor among individuals with HIV who receive ART, even among discordant couples.⁷ Understanding the dynamic influences that affect condom use among individuals with HIV in care is a critical step towards tailoring interventions to increase condom use.

With the expansion of ART across the region, and increasing interest in the role of ART as a preventive strategy to reduce HIV infectivity, information on sexual practices among HIV-positive men and women on ART is critical. The purpose of this analysis is to identify factors associated with condom use among individuals infected with HIV receiving care in Lilongwe, Malawi.

METHODS

This is a sub-analysis of data collected in a cross-sectional study evaluating reproductive health knowledge, attitudes and practices among HIV-positive individuals. We received approval to conduct the study from the National Health Services Research Committee in Malawi, the institutional review board at Emory University, and the institutional review board at the University of North Carolina-Chapel Hill. The study population included participants who attended one of the Lighthouse Trust clinics, integrated HIV testing, treatment, and care clinics in Lilongwe, Malawi. Methods for recruitment and enrollment were previously published.⁸ Briefly, between 26 September 2013 and 20 December 2013, we enrolled HIV-positive individuals between the ages of 18 and 45 years who were sexually active in the last 6 months. A sample size of 600 individuals was selected based on feasibility within the study time frame. Individuals were recruited from the waiting area in the clinic and taken to a private area to confirm study eligibility, review and sign written consent, and complete a questionnaire. For this analysis, we excluded individuals who did not report sexual intercourse in the last month.

Utilising a social-ecological framework, we conducted focus group discussions at the clinic prior to this study to inform the development of the questionnaire. Survey questions were a compilation of original study questions and questions used in the Malawi 2010 Demographic and Health Survey⁹ (DHS). Questions were pilot tested for clarity and intent prior to study initiation. The questionnaire was administered in Chichewa by a trained interviewer using a paper-based,

semi-structured questionnaire with 160 questions for women and 130 questions for men.

There were two primary outcomes of interest: self-reported condom use at last coitus (No vs Yes) and consistent condom use (Always vs Sometimes or Never) during intercourse over the past month. Condom use referred to use of either the male or female condom; however, female condom use is uncommon in Malawi.

Potential correlates of interest fell into six domains: (1) Sociodemographics: age, marital status, education, religion; (2) HIV-related: years since diagnosis, current use of ART, partner aware of HIV status, do HIV medications reduce risk of transmission to partner; (3) Sexual characteristics and risk behaviour: partner's serostatus, do you think your most recent partner has sex with others, number of partners in last month, sexual frequency, use of alcohol or drugs prior to or during sex in the last month; (4) Perception of condoms: effective at preventing pregnancy, effective at preventing HIV transmission risk; (5) Communication and self-efficacy: would you be able to refuse sex if your partner did not want to use a condom, in a relationship, who usually makes decisions on condom use; (6) Fertility intention and dual protection: do you want more children in the future; did you or your partner use contraceptive (other than condoms) at last intercourse, if partner is using contraceptive, do they need to use condoms.

Bivariate associations were determined using chi-squared tests for categorical variables and t-tests for continuous variables. Variables where the majority ($\geq 95\%$ of total study cohort) were within one of the categories were not maintained in the analysis. For continuous variables, we examined the data using categories based on median values, natural breaks, or common categories from similar studies. For these variables, where categorical evaluation did not reveal any nonlinear associations, the variable remained continuous for the analysis.

We conducted separate multivariate analyses for women and men using Poisson regression with robust standard errors to estimate the adjusted prevalence ratios (aPR) and 95% confidence intervals (CIs) for variables associated with our primary outcomes. Variables that were significant at $P < 0.10$ in bivariate analysis were included in each multivariate model.

RESULTS

We screened 623 individuals (349 women and 274 men) and enrolled a total of 562 study subjects (90.2%; 308 women and 254 men). A total of 475 individuals reported intercourse in the last month and were included in this analysis (255 females and 220 males). The mean age of the participants was 34.6 (range 18–45) years. The majority reported being married or in a committed relationship with one partner ($n=468$; 98.5%), sex with only one partner in the past month ($n=456$, 96.0%), and had at least

one child ($n=455$; 95.7%). Eighty-eight (18.6%) had a child born with HIV, and 126 (26.6%) had transmitted HIV to a partner.

Characteristics of our cohort by gender are presented in [table 1](#). The female participants were younger, more likely to desire children in the future, use contraception at last coitus and think their partner had sex with others. Males were more likely to use alcohol or drugs before or during coitus, know their partner's status and be able to refuse sex without a condom. Among the female participants, 38.2% (97/254) and 55.3% (140/253) reported always using a condom in the past month and condom use at last intercourse, respectively. Males were significantly more likely to report consistent condom use ($p=0.004$) and condom use at last intercourse ($p=0.002$) compared with female participants, with 51.4% (113/220) and 69.3% (151/218) males reporting always using a condom in the past month and condom use at last intercourse, respectively. Among all participants, a majority believed that either the use of ART increases the risk of transmission to partners ($n=212$, 45.0%) or does not change the risk ($n=102$, 21.7%).

Bivariate associations

For the female participants, consistent condom use in the past month was significantly associated with non-Catholic status, knowing one's partner's HIV status, lower sexual frequency (once weekly or less), no desire for future children, using ART, recognising a role for dual protection (belief that one needs to use a condom when also using a birth control method), the ability to refuse sex without a condom, and shared decision making on condom use ([table 2](#)). These same factors ([table 3](#)) except for ART use were associated with condom use at last coitus. Additionally, higher education was also associated with condom use at last coitus.

For the male participants, older age, longer time since HIV diagnosis, lower sexual frequency, no desire for future children, not using alcohol or drugs prior to or during sex, recognising a role for dual protection, the ability to refuse sex without a condom, and either making the decision or shared decision-making about condom use were associated with consistent condom use ([table 2](#)). Condom use at last coitus for men increased with lower sexual frequency, having a seronegative partner, no desire for future children, recognising a role for dual protection, the ability to refuse sex without a condom, and either making the decision or shared decision-making about condom use.

Among female and male participants there was no significant difference in condom use by perception of ART in reducing HIV transmission to partners (among all participants and among the subset of participants using ART, data not shown), perception of condoms

for pregnancy prevention, or use of a modern contraceptive method at last coitus other than condoms. Notably, despite only 47% of the couples believing that their partner was monogamous, this perception did not alter condom use behaviour.

Multivariate models

Among both men and women, being able to refuse sex without a condom was the strongest predictor of condom use in our multivariate model, both for consistent condom use and condom use at last coitus ([table 4](#)). Among the female participants, other factors associated with increased consistent condom use included using ART for at least 2 years and joint decision-making about condom use. The desire to have children in the future was negatively associated with consistent condom use. These same factors, except for ART use, were associated with condom use at last coitus among women. For men, in addition to the ability to refuse sex without a condom, joint decision-making about condom use was associated with increased consistent condom use, and increased sexual frequency was associated with decreased consistent condom use. Only the ability to refuse sex without a condom was associated with increased condom use at last intercourse among men.

DISCUSSION

Although our data demonstrate that condom use continues to be inconsistent among this study population, overall data from the Demographic and Health Surveys (DHS) in sub-Saharan Africa suggests increased condom use over the last one to two decades.¹⁰ Most participants recognise that condoms reduce HIV transmission risk; however, safe sexual practices seem to be influenced more by other factors, such as relationship dynamics, fertility intention and self-efficacy than perception of infection or transmission risk.

Similar to prior studies, our data demonstrate that couples that jointly make decisions regarding condom use more consistently use condoms, whereas when individuals independently make these decisions, condoms are less often used.¹¹ Negotiation of condom use can be challenging, particularly for women. Promotion efforts to develop a plan for safe sexual practices should be aimed at the couple. When both men and women are able to refuse sex without a condom,^{4 12} condom use improves, demonstrating that self-efficacy is a strong predictor of condom utilisation. Focused efforts to develop skills that allow individuals to negotiate for condom use and overcome the specific obstacles within relationships that reduce power to refuse sex without a condom could improve self-efficacy and condom use within these groups. Further, these findings suggest that poor communication within a relationship may inhibit

Table 1 Demographic, behavioural characteristics and beliefs among study participants by gender

Characteristics	Female (n=255)		Male (n=220)		P value*
	n	(%)	n	(%)	
Age (years, mean±SD)	32.1±6.36		37.40±5.19		<0.001
Marital status					0.087
Married/committed relationship	249	(97.6)	219	(99.6)	
Single/dating	6	(2.4)	1	(0.4)	
Education					0.011
Some secondary or less	219	(85.9)	169	(76.8)	
Completed secondary or more	36	(14.1)	51	(23.2)	
Religion					0.264
Catholic	50	(19.7)	47	(21.5)	
Protestant	186	(73.2)	152	(69.4)	
Muslim	18	(7.1)	17	(7.8)	
Other/no religion	0	(0)	3	(1.4)	
Years since diagnosis (mean±SD)	4.64±3.45		4.62±4.14		0.949
Use of alcohol or drugs before/during sex in last month					<0.001
No	229	(92.3)	161	(73.2)	
Yes	19	(7.7)	59	(26.8)	
Most recent sexual partner HIV-positive					0.004
No	47	(18.5)	40	(18.2)	
Yes	163	(64.2)	164	(74.6)	
Do not know	44	(17.3)	16	(7.3)	
Most recent sexual partner has sex with other people					<0.001
No	81	(31.8)	141	(64.4)	
Yes	101	(39.6)	30	(13.7)	
Do not know	73	(28.6)	48	(21.9)	
Sexual frequency in last month					0.658
≤weekly	120	(47.1)	108	(49.1)	
>1x/week	135	(52.9)	112	(50.9)	
Sexual partners in past month (n)					0.073
1	248	(97.2)	208	(94.6)	
2–4	4	(1.6)	11	(5.0)	
>5	3	(1.2)	1	(0.4)	
Children (n)					0.006
0	14	(5.5)	6	(2.7)	
1–2	123	(48.2)	81	(36.8)	
>3	118	(46.3)	133	(60.5)	
Desire more children in the future					0.010
No	160	(62.8)	161	(73.9)	
Yes	95	(37.2)	57	(26.1)	
Contraceptive use at last intercourse (IUD, implant, DMPA, pills, sterilisation, not including condom)					0.202
No	140	(55.6)	135	(61.4)	
Yes	112	(44.4)	85	(38.6)	
Currently using ART					0.846
No	29	(11.4)	26	(11.8)	
Yes, <2 years	86	(33.7)	79	(35.9)	

Continued

Table 1 Continued

Characteristics	Female (n=255)		Male (n=220)		P value*
	n	(%)	n	(%)	
Yes, >2 years	140	(54.9)	115	(52.3)	
Believe HIV medications effect transmission risk to partner					0.577
Increases risk or no change	166	(65.6)	149	(68.0)	
Decreases risk	87	(34.4)	70	(32.0)	
Believe condoms are effective at preventing pregnancy					0.487
No	28	(11.0)	20	(9.1)	
Yes	226	(89.0)	200	(90.0)	
Believe condoms prevent HIV transmission to partner					0.057
No	41	(16.7)	50	(23.8)	
Yes	205	(83.3)	160	(76.2)	
Believe one needs to use a condom if using also birth control method					0.064
No	69	(27.3)	44	(20.0)	
Yes	184	(72.7)	176	(80.0)	
Can refuse sex if partner did not want to use a condom					<0.001
No	127	(50.6)	64	(29.4)	
Yes	124	(49.4)	154	(70.6)	
Decision-making about using condom use					0.117
I do (did)	131	(54.4)	93	(45.2)	
My partner does (did)	35	(14.5)	31	(15.0)	
We both do (did) equally	75	(31.1)	82	(39.8)	
Consistent condom use in past month					0.004
No	157	(61.8)	107	(48.6)	
Yes	97	(38.2)	113	(51.4)	
Condom use at last intercourse					0.002
No	113	(44.7)	67	(30.7)	
Yes	140	(55.3)	151	(69.3)	

*P value by t-test for continuous variables and Pearson chi-square or Fisher exact test for categorical variables.
ART, antiretroviral therapy; DMPA, depot medroxyprogesterone acetate; IUD, intrauterine device.

condom use.^{4 13 14} The development of communication strategies for couples at greatest risk, designed to strengthen dialogue regarding sexual and reproductive health within the relationship and increase condom use, could help address the discrepancies between risk and behaviour.

We found that use of effective contraceptive methods did not alter condom use behaviours, further reinforcing the finding that effective pregnancy prevention method promotion will not detract from sexually transmitted infection/HIV prevention efforts. Rather, for men, believing in the need for ‘dual protection’ increased condom use. Similar to other studies, we did not find that ART use and knowledge that ART use decreases transmission risk alters condom use behaviour among our cohort of primarily ART users.¹⁵ Rather, similar to one prior study, we found the opposite trend: increased condom use among women on ART for a longer time.¹⁶ These results echo what others are reporting: the promotion of specific HIV prevention

strategies, such as ART treatment as prevention, will not reduce other HIV prevention behaviours.¹⁷ It is unclear why there is a high proportion of individuals who perceive their risk of transmission to partners increases with the use of ART or does not change. This finding may be specific to this cohort or may reflect a broader misunderstanding of the association between low viral load and decreased transmission potential. Further, it is possible that providers choose to not discuss this association given concern that it may lead to altered risk behaviour. Future efforts need to explore patient perceptions further, and potentially increase awareness of the impact of viral suppression on HIV transmission.

The trend toward reduced condom use with greater sexual frequency noted in our study has been reported in other studies,⁴ suggesting that user fatigue may play a role in condom non-use. Another finding echoed by others is that alcohol use decreases condom use.¹⁸ Whereas other studies have noted demographic differences, such as age

Table 2 Demographic, behavioural characteristics and beliefs of female and male participants by reporting consistent condom use in the last month

Characteristics	Consistent condom use (always using condom in last month)						
	Female (n=254)				Male (n=220)		
	No (n=157)	(61.8%)	Yes (n=97)	(38.2%)	No (n=107)	(48.6%)	Yes (n=113)
	n	(%)	n	(%)	n	(%)	n
Age (years, mean±SD)	32.0±6.2		32.2±6.7		36.8±5.4		38.0±4.9
Marital status							
Married or committed relationship	153	(61.7)	95	(38.3)	106	(48.4)	113
Single or dating	4	(61.7)	2	(33.3)	1	(100.0)	0
Education							
Some secondary or less	139	(63.5)	80	(36.5)	85	(50.3)	84
Completed secondary or more	18	(51.4)	17	(48.6)	22	(43.1)	29
Religion							
Catholic	39	(78.0)	11	(22.0)	23	(48.9)	24
Other	118	(57.8)	86	(42.2)	83	(48.3)	89
Years since diagnosis (mean±SD)	4.5±3.6		4.9±3.2		4.0±3.3		5.2±4.7
Use of alcohol or drugs before/during sex in last month							
No	139	(61.0)	89	(39.0)	70	(43.5)	91
Yes	12	(63.2)	7	(36.8)	37	(62.7)	22
Most recent sexual partner HIV-positive							
No	27	(57.5)	20	(42.6)	14	(35.0)	26
Yes	95	(58.6)	67	(41.4)	82	(50.0)	82
Do not know	34	(77.3)	10	(22.7)	11	(68.8)	5
Sexual frequency in last month							
≤weekly	64	(53.8)	55	(46.2)	46	(42.6)	62
>1x/week	93	(68.9)	42	(31.1)	61	(54.5)	51
Desire more children in the future							
No	87	(54.4)	73	(45.6)	68	(42.2)	93
Yes	70	(74.5)	24	(25.5)	38	(66.7)	19
Contraceptive use at last intercourse (IUD, implant, DMPA, pills, Sterilisations, not including condom)							
No	87	(62.6)	52	(37.4)	66	(48.9)	69
Yes	68	(60.7)	44	(39.3)	41	(48.2)	44
Currently using ART							

Continued

Table 2 Continued

Consistent condom use (always using condom in last month)										
Characteristics	Female (n=254)					Male (n=220)				
	No (n=157)	(61.8%)	Yes (n=97)	(38.2%)	P value*	No (n=107)	(48.6%)	Yes (n=113)	(51.4%)	
	n	(%)	n	(%)		n	(%)	n	(%)	
No	20	(71.4)	8	(28.6)	0.742	16	(61.5)	10	(38.5)	0.602
Yes, <2years	59	(68.6)	27	(31.4)		37	(46.8)	42	(53.2)	
Yes, >2years	78	(55.7)	62	(44.3)		54	(47.0)	61	(53.0)	
Believe HIV medications effect transmission risk to partner										
Increases risk or no change	104	(63.0)	61	(37.0)	0.475	71	(47.7)	78	(52.4)	0.898
Decreases risk	53	(60.9)	34	(39.1)		36	(51.4)	34	(48.6)	
Believe condoms are effective at preventing pregnancy										
No	19	(67.9)	9	(32.1)	0.139	10	(50.0)	10	(50.0)	0.314
Yes	137	(60.9)	88	(39.1)		97	(48.5)	103	(51.5)	
Believe condoms are effective at preventing HIV transmission to partner										
No	29	(70.7)	12	(29.3)	0.067	20	(40.0)	30	(60.0)	<0.001
Yes	119	(58.3)	85	(41.7)		77	(48.1)	83	(51.9)	
Believe one needs to use a condom if also using birth control method										
No	49	(71.0)	20	(29.0)	<0.001	33	(75.0)	11	(25.0)	<0.001
Yes	107	(58.5)	76	(41.5)		74	(42.1)	102	(58.0)	
Can refuse sex if partner did not want to use a condom										
No	111	(87.4)	16	(12.6)	<0.001	52	(81.3)	12	(18.8)	0.025
Yes	42	(34.2)	81	(65.9)		55	(35.7)	99	(64.3)	
Decision-making about using condom use										
I do (did)	93	(71.5)	37	(28.5)	<0.001	45	(48.4)	48	(51.6)	0.025
My partner does (did)	22	(62.9)	13	(37.1)		20	(64.5)	11	(35.5)	
We both do (did) equally	28	(37.3)	47	(62.7)		30	(36.6)	52	(63.4)	

* P value by t-test for continuous variables and Pearson chi-square or Fisher exact test for categorical variables.
ART, antiretroviral therapy; DMPA, depot medroxyprogesterone acetate; IUD, intrauterine device.

Table 3 Demographic, behavioural characteristics and beliefs of female and male participants by reporting condom use at last coitus

Condom use at last coitus										
Characteristics	Female (n=253)					Male (n=218)				
	No (n=113)	(44.7%)	Yes (n=140)	(55.3%)	P value	No (n=67)	(30.7%)	Yes (n=151)	(69.3%)	P-value*
	n	(%)	n	(%)		n	(%)	n	(%)	
Age (years, mean±SD)	32.1±6.0		32.1±6.7		0.924	37.7±5.1		37.2±5.2		0.568
Marital status										
Married or committed relationship	110	(44.5)	137	(55.5)	0.790					
Single or dating	3	(50.0)	3	(50.0)						
Education										
Completed primary or less	102	(47.0)	115	(53.0)	0.066	53	(31.7)	114	(68.3)	0.562
Some secondary or more	11	(30.6)	25	(69.4)		14	(27.5)	37	(72.6)	
Religion										
Catholic	29	(58.0)	21	(42.0)	0.034	16	(34.0)	31	(66.0)	0.595
Other	84	(41.4)	119	(58.6)		51	(30.0)	119	(70.0)	
Years since diagnosis (mean±SD)	4.5±3.6		4.8±3.4		0.515	4.1±3.4		4.9±4.4		0.197
Use of alcohol or drugs before/during sex in last month										
No	99	(43.6)	128	(56.4)	0.447	43	(27.0)	116	(73.0)	0.053
Yes	10	(52.6)	9	(47.4)		24	(40.7)	35	(59.3)	
Most recent sexual partner HIV positive										
No	21	(45.7)	25	(54.3)	0.027	7	(18.0)	32	(82.1)	0.053
Yes	65	(39.9)	98	(60.1)		52	(31.9)	111	(68.1)	
Do not know	27	(62.8)	16	(37.2)		8	(50.0)	8	(50.0)	
Sexual frequency in last month										
≤weekly	45	(37.5)	75	(62.5)	0.029	23	(21.5)	84	(78.5)	0.004
>1x/week	68	(51.1)	65	(48.9)		44	(39.6)	67	(60.4)	
Desire more children in the future										
No	60	(37.7)	99	(62.3)	0.004	42	(26.4)	117	(73.6)	0.015
Yes	53	(56.4)	41	(43.6)		25	(43.9)	32	(56.1)	
Contraceptive use at last intercourse (IUD, implant, DMPA, pills, sterilisation, not including condom)										
No	65	(46.8)	74	(53.2)	0.400	40	(29.9)	94	(70.2)	0.721
Yes	46	(41.4)	65	(58.6)		27	(32.1)	57	(67.9)	
Currently using ART										
No	17	(58.6)	12	(41.4)	0.169	9	(34.6)	17	(65.4)	0.886

Continued

Table 3 Continued

Characteristics	Condom use at last coitus					
	Female (n=253)			Male (n=218)		
	No (n=113)	(44.7%)	Yes (n=140)	(55.3%)	No (n=67)	(30.7%)
	n	(%)	n	(%)	n	(%)
Yes, <2 years	40	(47.1)	45	(52.9)	23	(29.5)
Yes, >2 years	56	(40.3)	83	(59.7)	35	(30.7)
Believe HIV medications effect transmission risk to partner						
Increases risk or no change	70	(42.7)	94	(57.3)	41	(27.9)
Decreases risk	43	(49.4)	44	(50.6)	26	(37.1)
Believe condoms are effective at preventing pregnancy						
No	15	(53.6)	13	(46.4)	9	(45.0)
Yes	97	(43.3)	127	(56.7)	58	(29.3)
Believe condoms are effective at preventing HIV transmission to partner						
No	18	(43.9)	23	(56.1)	12	(24.0)
Yes	86	(42.4)	117	(57.6)	45	(28.5)
Believe one needs to use a condom if also using birth control method						
No	37	(54.4)	31	(45.6)	21	(48.8)
Yes	75	(41.0)	108	(59.0)	46	(26.3)
Can refuse sex if partner did not want to use a condom						
No	87	(69.0)	39	(31.0)	38	(59.4)
Yes	23	(18.6)	101	(81.5)	28	(18.4)
Decision-making about using condom use						
I do (did)	67	(51.2)	64	(48.9)	23	(24.7)
My partner does (did)	14	(41.2)	20	(58.8)	14	(45.2)
We both do (did) equally	19	(25.3)	56	(74.7)	18	(22.2)

* P value by t-test for continuous variables and Pearson chi-square or Fisher exact test for categorical variables.
ART, antiretroviral therapy; DMPA, depot medroxyprogesterone acetate; IUD, intrauterine device.

Table 4 Multivariate poisson regression models evaluating factors associated with evaluating consistent condom use and condom use at last coitus for female and male participants

	Consistent condom use (past month)		Use at last coitus	
	Female	Male	Female	Male
	(APRs (95% CI))	(APRs (95% CI))	(APRs (95% CI))	(APRs (95% CI))
Age		1.01 (0.98 to 1.04)		
Education				
Some secondary or less			1	
Completed secondary or more			1.20 (0.94 to 1.51)	
Catholic				
Yes	1		1	
No	1.50 (0.89 to 2.52)		1.18 (0.86 to 1.61)	
Years since diagnosis		1.01 (0.99 to 1.04)		
Use of alcohol or drugs before/during sex in last month				
No		1		1
Yes		0.82 (0.60 to 1.11)		0.99 (0.81 to 1.20)
Sexual frequency in last month				
≤weekly	1	1	1	1
>1 x/week	0.79 (0.62 to 1.00)	0.96 (0.76 to 1.22)	0.87 (0.72 to 1.05)	0.90 (0.76 to 1.05)
Currently using ART				
No	1			
<2 years	1.31 (0.85 to 2.02)			
≥2 years	1.52 (1.03 to 2.23)*			
Desire more children in the future				
No	1	1	1	1
Yes	0.69 (0.51 to 0.93)*	0.84 (0.57 to 1.24)	0.74 (0.59 to 0.93)*	0.95 (0.75 to 1.20)
Most recent sexual partner HIV-positive				
Yes	0.89 (0.70 to 1.13)	0.87 (0.67 to 1.13)	1.27 (0.96 to 1.70)	0.88 (0.75 to 1.03)
No	1	1	1	1
I do not know	0.66 (0.42 to 1.03)	0.59 (0.28 to 1.24)	1.24 (0.52 to 1.51)	0.66 (0.41 to 1.08)
Believe one needs to use a condom if using also birth control method				
No	1	1	1	1
Yes	1.09 (0.80 to 1.48)	1.88 (1.16 to 3.05)*	1.08 (0.84 to 1.39)	1.24 (0.96 to 1.60)
Can refuse sex if partner did not want to use a condom				
No	1	1	1	1
Yes	4.33 (2.72 to 6.90)*	2.77 (1.68 to 4.58)*	2.27 (1.74 to 2.95)*	1.70 (1.28 to 2.27)*
Decision-making about using condom use				
I do	1	1	1	1
My partner does	1.34 (0.88 to 2.04)	0.89 (0.56 to 1.41)	1.28 (0.96 to 1.70)	0.81 (0.59 to 1.11)
We both do	1.50 (1.15 to 1.97)*	0.98 (0.77 to 1.26)	1.24 (1.02 to 1.51)*	0.93 (0.80 to 1.10)

The prevalence ratios presented are adjusting for all variables with results included in the table for the specific gender and outcome.

*P<0.05.

APRs, adjusted prevalence ratios; ART, antiretroviral therapy CI, CI interval.

and education, to be predictive of condom use, demographic differences in our cohort were not predictive. Thus, efforts to improve condom use need to be applied broadly, irrespective of these factors.

A strength of this study is that we applied two measures used in prior research to evaluate for condom use, allowing us to evaluate different

trends that may be related to consistent use over use at last intercourse. A limitation, however, is that both of these are self-reported measures and reporting bias may influence the accuracy of the responses. Social desirability bias may have led both men and women to over-report condom use or other variables such as decision-making for

condom use. Another strength of this study is the parallel evaluation of men and women, allowing us to evaluate trends that may differ by gender. However, we did not evaluate couples, so we cannot compare responses or comment on the dynamics that may be related to sexual practices within a specific relationship. We are limited in our ability to comment on any causal relationship between factors evaluated (such as ART use or contraception use) and condom use; a longitudinal evaluation is recommended to further evaluate this dynamic relationship. As we are conducting this evaluation at two clinics in Lilongwe where study population characteristics, such as high rates of monogamy and ART use, may differ from other settings, the generalisability of our findings may be limited. Lastly, although this is one of the larger evaluations of men and women with HIV receiving care, we may still have limited power in our predictive models to detect some true associations, especially in cases where we have lower prevalence of those covariates (such as non-ART users or single individuals). Non-significant findings may be echoed in other studies and add to our evolving understanding on drivers of condom use.

In conclusion, our study highlights that among high-risk men and women living with HIV, condom use continues to be inconsistent. Previously proven interventions to reduce sexual risk behaviours¹⁹ must be personalised to each setting, with efforts to target specific barriers that exist for that community. Among the individuals in our clinical setting, HIV- and ART-related factors and contraceptive use were not central in determining condom use. Condom use was influenced more by relationship dynamics, fertility intention and self-efficacy than perception of infection or transmission risk. To effectively target future efforts at HIV and STI prevention, we must recognise the multiple influences that determine condom use, explore methods and employ tools to facilitate condom negotiation and joint decision-making.

Acknowledgements The authors would like to thank the study participants, the study research assistants (Justin Milonde and Felix Mtunga), and the staff of the Lighthouse Trust Clinics for their assistance and support of the study.

Contributors LH conceived the study and drafted the survey with JT and HT. JT oversaw its operational aspects with SP, HT, TC, BS and LM. LH conducted data analysis and drafted the initial manuscript. All authors read and approved the final manuscript.

Funding This study was supported by a grant from the Society in Family Planning (PI: Lisa Haddad). Dr Haddad received support through a career development award from the National Institute of Health (1K23HD078153-01A1).

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

© Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Reynolds HW, Luseno WK, Speizer IS. The measurement of condom use in four countries in East and southern Africa. *AIDS Behav* 2012;16:1044–53.
- 2 Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev* 2001;3:CD003255.
- 3 Hearst N, Chen S. Condom promotion for AIDS prevention in the developing world: is it working? *Stud Fam Plann* 2004;35:39–47.
- 4 Sarkar NN. Barriers to condom use. *Eur J Contracept Reprod Health Care* 2008;13:114–22.
- 5 UNAIDS. *Malawi HIV/AIDS estimates*. Geneva, Switzerland: UNAIDS, 2014. <http://www.unaids.org/en/regionscountries/countries/malawi>
- 6 Government of Malawi. *Malawi AIDS progress report 2015*, 2015. http://www.unaids.org/sites/default/files/country/documents/MWI_narrative_report_2015.pdf
- 7 Haddad LB, Feldacker C, Jamieson DJ, *et al.* Pregnancy prevention and condom use practices among HIV-infected women on antiretroviral therapy seeking family planning in Lilongwe, Malawi. *PLoS One* 2015;10:e0121039.
- 8 Tang JH, Phiri S, Ng'ambi W, *et al.* Factors associated with hormonal and intrauterine contraceptive use among HIV-Infected men and women in Lilongwe, Malawi: a cross-sectional study. *Infect Dis Obstet Gynecol* 2016;2016:1–8.
- 9 National Statistical Office (NSO) and ICF Macro. *Malawi demographic and health survey 2010*. 2011 <https://dhsprogram.com/pubs/pdf/FR247/FR247.pdf> (accessed 14 Sep 2017).
- 10 Legemate EM, Hontelez JAC, Looman CWN, *et al.* Behavioural disinhibition in the general population during the antiretroviral therapy roll-out in Sub-Saharan Africa: systematic review and meta-analysis. *Trop Med Int Health* 2017;22:797–806.
- 11 Muldoon KA, Duff PK, Birungi J, *et al.* Decisions, decisions: the importance of condom use decision making among HIV sero-discordant couples in a prospective cohort study in Uganda. *Sex Transm Infect* 2014;90:408–12.
- 12 Dempsey AG, MacDonell KE, Naar-King S, *et al.* Patterns of disclosure among youth who are HIV-positive: a multisite study. *J Adolesc Health* 2012;50:315–7.
- 13 Carter MW, Kraft JM, Hatfield-Timajchy K, *et al.* The reproductive health behaviors of HIV-infected young women in the United States: a literature review. *AIDS Patient Care STDS* 2013;27:669–80.
- 14 Clum GA, Chung SE, Ellen JM, *et al.* Victimization and sexual risk behavior in young, HIV positive women: exploration of mediators. *AIDS Behav* 2012;16:999–1010.

- 15 Ekorinyang R. Utilization of contraceptives by persons living with HIV in Eastern Uganda: a cross sectional study. *Reprod Health* 2015;12:40.
- 16 Shewamene Z, Legesse B, Tsega B, *et al.* Consistent condom use in HIV/AIDS patients receiving antiretroviral therapy in northwestern Ethiopia: implication to reduce transmission and multiple infections. *HIV AIDS* 2015;7:119–24.
- 17 Carlo Hojilla J, Koester KA, Cohen SE, *et al.* Sexual behavior, risk compensation, and HIV prevention strategies among participants in the San Francisco PrEP demonstration project: a qualitative analysis of counseling notes. *AIDS Behav* 2016;20:1461–9.
- 18 Scott-Sheldon LA, Walstrom P, Carey KB, *et al.* Alcohol use and sexual risk behaviors among individuals infected with HIV: a systematic review and meta-analysis 2012 to early 2013. *Curr HIV/AIDS Rep* 2013;10:314–23.
- 19 Scott-Sheldon LA, Walstrom P, Harrison A, *et al.* Sexual risk reduction interventions for HIV prevention among South African youth: a meta-analytic review. *Curr HIV Res* 2013;11:549–58.

Moving towards decriminalisation of abortion in the UK

Over the past year, readers of this journal cannot fail to have noticed the events and media references marking the 50th anniversary of the passage of the 1967 UK Abortion Act. But 2017 was also notable for another important development in relation to the provision of abortion – the increasing prominence of calls for its decriminalisation.

As this first issue of *BMJ Sexual & Reproductive Health* went to press, the Faculty of Sexual & Reproductive Healthcare (FSRH) became the latest professional organisation to put its name to the movement to remove abortion from the sphere of the criminal law. The 1967 Act provided specific exceptions to the 1861 Offences Against the Person Act, permitting abortion to be performed in certain specified circumstances, but retaining the threat of criminal sanctions against women or health professionals if its provisions are not complied with.

Decriminalisation would place abortion firmly in the framework of regulation by professional healthcare standards, as with all other branches of medicine. The FSRH's statement on 23 November 2017¹ supporting the removal of criminal sanctions was informed by a recent consultation with its members, which showed a broad and clear consensus for its position in favour of removal of abortion from the sphere of criminal law. The Faculty also supported the removal of the Act's restrictions on places where abortion medication could be administered, and emphasised the importance of the provision of contraceptive services in association with abortion care. Significantly, the statement used the words "throughout the UK", since the 1967 Act still does not apply in Northern Ireland, where abortion remains illegal except in a few very strictly defined circumstances.

In taking its position, the FSRH joined several other professional organisations. The Royal College of Midwives was the first to publish a position statement in 2016, but in June 2017 the British Medical Association's annual representative meeting voted strongly in favour of decriminalisation, and this was followed in September by the vote of the Council of the Royal College of Obstetricians and Gynaecologists. Not surprisingly the same position is held by the UK's major abortion-providing organisations, by pro-abortion groups and by the British Society of Abortion Care Providers, which was formed in 2015.

But in my view the event of greatest significance in 2017 was the introduction of MP Diana Johnson's Reproductive Health (Access to Terminations) Bill in the House of Commons in March 2017. The Bill called for the decriminalisation of abortion up to 24 weeks. After her introductory speech – well worth reading² – and a strong, emotionally charged and rather inaccurate opposing speech, MPs voted 172 to 142 in favour of the Bill progressing. It was scheduled to have a second reading in May, only for it to fall by the wayside, as did all pending legislation, when the Prime Minister called her 'snap' general election.

So the year 2017, while notable for an important anniversary, did not produce the advance in abortion legislation that had been anticipated. During this year, 2018, there will be celebrations in the UK to mark the 100th anniversaries of the Representation of the People Act 1918, which gave women the vote, and the Parliament (Qualification of Women) Act, which allowed women to stand for election to the House of Commons. Perhaps this year will also see the reintroduction of a bill that will release British women, and professionals, from legislation that is archaic, that is no longer in step with mainstream views and that does not reflect progress in medical care. *BMJ Sexual & Reproductive Health* will keep readers updated.

David H Horwell

Advisory Editor UK/Europe, *BMJ Sexual & Reproductive Health*; dhhjournal@mail.com

Provenance and peer review Not commissioned; internally peer reviewed.

References

- 1 Faculty of Sexual & Reproductive Healthcare. FSRH statement on the decriminalisation of abortion care. 23 November 2017. <https://www.fsrh.org/news/fsrh-statement-on-the-decriminalisation-of-abortion-care/> [accessed 28 November 2017].
- 2 *Hansard*. House of Commons 13 March 2017 Vol. 623. Reproductive Health (Access to Terminations). [https://hansard.parliament.uk/commons/2017-03-13/debates/D76D740D-2DDD-4CCB-AC11-C0DBE3B7D0D8/ReproductiveHealth\(AccessToTerminations\)](https://hansard.parliament.uk/commons/2017-03-13/debates/D76D740D-2DDD-4CCB-AC11-C0DBE3B7D0D8/ReproductiveHealth(AccessToTerminations)) [accessed 28 November 2017].