

and being HSV2 seropositive at baseline (IRR1.7, 95% CI 0.99 to 2.8, $p=0.055$) were associated with an increased risk of seroconversion in younger women. In older women, decreasing partner contribution to the household economy (IRR 1.3, 95% CI 1 to 1.7) and *Trichomonas vaginalis* infection at enrolment (IRR 2.3, 95% CI 1.1 to 4.9) were associated with increased risk of HIV acquisition. Older women who reported condom use at last sex act had a greater risk of acquiring HIV (IRR 2.8, 95% CI 1.3 to 5.9), which could reflect high risk sexual behaviour in this group. Reporting multiple partners was associated with increased risk of HIV acquisition in both younger (2.6, 1.3 to 5.3) and older women (2.8, 1.3 to 6.1).

Conclusions STIs remain an important marker of ongoing HIV risk. Interventions that address the economic context of women's HIV risk will be important to evaluate. Additional investigation using multivariate analysis may elucidate these findings further.

P1-S5.15 CONTRIBUTION OF CONDOM BREAKAGE TO THE HIV EPIDEMIC AMONG MEN WHO HAVE SEX WITH MEN IN KARNATAKA, INDIA

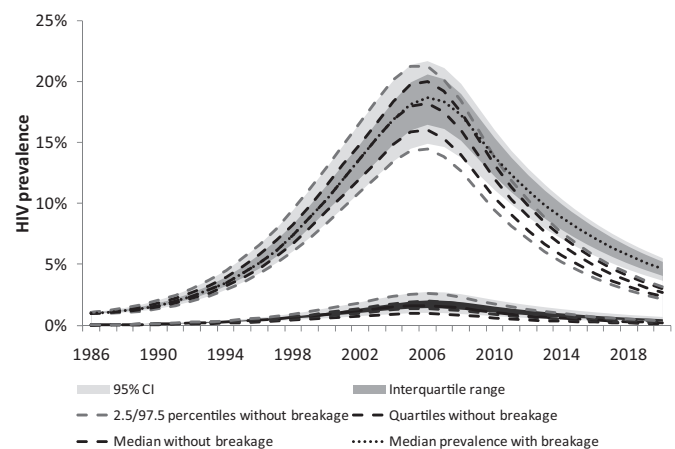
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Background Condom promotion among female sex workers (FSWs) and men who have sex with men (MSM) is one of the key components of the Avahan HIV intervention currently underway in India. High rates of consistent condom use are reported across sites. However, condoms are only effective if they do not break or slip during intercourse, which occur frequently, especially in MSM.

Methods We use a deterministic compartmental mathematical model of MSM divided into high and low risk, with average condom use increasing over time, to investigate how breakage influences the course of the epidemic. High-risk MSM (HRMSM) sell sex or have many casual partners, and typically have mostly receptive anal sex. Prior parameter ranges (including condom use) for the model are based on one round of cross-sectional behavioural and biological (IBBA) surveys of HRMSM from four districts in Karnataka state in 2008. In these surveys 16.7% (82/491) of MSM report condom breakage in the last sex act. Condom use increased to 93% by 2008, and was assumed to be constant afterwards. The prior ranges are sampled using Latin hypercube sampling. Model runs that agree with measured HRMSM HIV prevalence (12.7–18.9%) provide the posterior parameter set fitting the data, and are used to make predictions of HIV prevalence with and without condom breakage after the start of the intervention in 2004.

Results Abstract P1-S5.15 figure 1 shows change in high/low risk prevalences with and without condom breakage. Even with high rates of condom breakage, HIV prevalence among MSM declines from 16.7% (95% CI 12.7 to 20.8%) in 2004 to 7.9% (5.9 to 9.8%) in HRMSM by 2015. Without condom breakage HIV prevalence declines faster, to 5.6% (4.2 to 6.9%) by 2015. Compared to no condom breakage, there will be 10.3% (10.7%) more cumulative infections with breakage in high-risk (low-risk) MSM from 2004 until 2015. The annual extra fraction of new infections due to condom breakage increases from 4.1% (4.3%), in 2004, to 158.9% (165.3%), in 2015 in high-risk (low-risk) MSM, although the absolute number of infections due to condom breakage decreases as the epidemic is declining and condom use increases.



Abstract P1-S5.15 Figure 1 HIV prevalence against time for high-risk MSM (upper curves) and low-risk MSM (lower curves). Shaded region shows 2.5–97.5 percentiles and IQR with breakage. The dashed lines show the 2.5, 97.5 percentiles and quartiles without condom breakage.

Conclusions HIV prevalence is projected to decline in MSM in Karnataka, given high rates of reported condom use, even with frequent breakage. However, there will be a large fraction of extra infections due to condom breakage. HIV intervention programmes should examine reasons for high rates of breakage and take steps to address this.

P1-S5.16 INVESTIGATING SELF-REPORTED LEVEL OF CONDOM USE AND CONDOM USE IN LAST ACT AMONG HIGH-RISK GROUPS IN SOUTHERN INDIA

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Background Measuring consistent condom use (CCU) is crucial in understanding the trajectory of the HIV epidemic and in evaluating HIV preventive interventions that promote condom use. We examine how one measure of CCU varies across different populations, and compare it to condom use in the last sex act.

Methods Using data from cross-sectional behavioural and biological surveys (2005–2007), we compare responses concerning self-reported level of condom use and condom use in the last act by female sex workers (FSWs), their clients, and men who have sex with men (MSM) in districts from Andhra Pradesh, Maharashtra and Tamil Nadu states in India. For FSWs/clients, the question related to sex with occasional clients/FSWs. For MSM, the question was for non-commercial, non-regular male partners. The time period was unspecified. Levels of condom use were defined as every time, “most of the time/sometimes”, and “never”. We define CCU as those who reply “every time”.

Results 95.2% of all FSWs reported using a condom in the last act, compared to 72.9% of clients and 80.0% MSM. However, only 36.7% of clients and 29.6% of MSM reported CCU compared to 80.0% of FSWs. Abstract P1-S5-16 table 1 shows condom use in the last act stratified by reported level of condom use. For all populations reporting CCU “always”, condom use in the last act was >98%. Of those who reported “most of the time/sometimes”, there was a significant difference between condom use in the last act between clients and the other groups (χ^2 test,

Abstract P1-S5.16 Table 1 Results from IBBA surveys in Andhra Pradesh, Maharashtra and Tamil Nadu states

	Report using a condom "every time"	Report using a condom "sometimes/most of the time"	Report using a condom "never"	Used a condom in last sex act		
				Report using a condom "every time"	Report using a condom "sometimes /most of the time"	Report using a condom "never"
FSW	80.00% (4010)	19.01% (953)	0.96% (93)	98.28%	87.20%	2.08%
Client	36.67% (1667)	48.20% (2191)	15.13% (688)	98.50%	75.58%	2.03%
MSM	29.63% (621)	63.63% (1648)	12.39% (321)	99.36%	88.17%	1.25%

$p < 0.001$), with clients using condoms less frequently. Condom use in the last act among those who "never" use a condom was low ($< 3\%$).

Conclusions CCU may not accurately reflect number of acts protected by condoms. Among males in particular, dividing condom users into CCU and non-CCU neglects many who almost always use condoms, and so will still have a high degree of protection. These individuals are an important group to consider when evaluating the effect of changes in condom use on the HIV epidemic, especially among MSM. HIV prevention programmes should try to identify reasons explaining lower CCU among MSM and clients who already use condoms "most of the time/sometimes", and endeavour to increase consistency within this group.

P1-S5.17 THE ASSOCIATION BETWEEN MARITAL TRANSITION AND HIV SEROCONVERSION IN A COHORT OF YOUNG PEOPLE IN RURAL TANZANIA

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Background HIV and STI incidence rises sharply during adolescence and young adulthood due to increased sexual activity. At this time youth also undergo major life transitions for example, leaving school, becoming sexually active, leaving home and getting married. It is hypothesised that risk of HIV/STIs increases during or just after such transitions for example, the interval between acquiring a first

sexual partner and first marriage is usually the time of most rapid partner turnover. Targeting youth, their sexual partners, and/or families at key transitional periods may be effective in reducing HIV/STI rates. This study explores the association between marital transitions (change in marital status) and HIV seroconversion in a cohort in Tanzania.

Methods In 1998, the MEMA kwa Vijana sexual and reproductive health intervention trial recruited 9645 young people aged 14–17 years in rural Mwanza. We analysed a sub-set of the cohort (3240) who attended follow-up surveys in 2001 and 2007. Reported marital and measured HIV status at both time points was used to describe marital transitions and their association with HIV seroconversion. Logistic regression, adjusting for demographic, behavioural and biological risk factors was used to assess whether marital transition was independently associated with seroconversion.

Results Cases of HIV and the proportion married increased very substantially between 2001 and 2007 (Abstract P1-S5.17 table 1). Seroconversion rates were higher among females remaining unmarried (6.4%, $p=0.01$) and those transitioning from married or never married to previously married (8.8%, $p < 0.001$). HIV seroconversion was independently associated with recent travel and HSV2 infection among males and number of recent sexual partners, HSV2 infection and lifetime number of pregnancies among females. Marital transition was not an independent risk factor.

Conclusions Women who remained unmarried and/or transitioned from married/unmarried to previously married during the 6 year follow-up were more likely to become infected with HIV. The association between marital transition and HIV seroconversion among females appeared largely due to differences in number of reported sexual partners. Limitations included the lack of information on the exact timing of marriage or breakdown of marriage and of seroconversion, and the limited proportion of cohort members eligible for inclusion. Nevertheless, marital transitions appear important determinants of risk.

Abstract P1-S5.17 Table 1 HIV prevalence and marital status

Variable	Marital status and transition	Males (N = 1984)		Females (N = 1256)			
		Distribution	HIV prevalence (%)	Distribution	HIV prevalence (%)		
2001	Never married	96%	0.1	69%	0.6		
	Currently married	4%	0.0	29%	0.8		
	Previously married	0.2%	0.0	1%	0.0		
	All	100%	0.1	100%	0.6		
2007	Never married	38%	2.0	15%	7.7		
	Currently married	58%	3.3	74%	3.2		
	Previously married	4%	4.0	11%	8.6		
	All	100%	2.8	100%	4.5		
Inter-survey changes	Remained unmarried	38%	0.0	14%	1.1	2001	2007
	Remained married	3%	0.0	26%	0.9	1.5	3.7
	Became married	55%	0.2	49%	0.5	3.4	3.0
	Married/unmarried to previously married	3.4%	0.0	12%	0.0	3.9	8.8
	All	100%	0.5	2.8	0.7	100%	4.5