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# Bringing it home: community survey of HIV risks to primary sex partners of men and women in alcohol-serving establishments in Cape Town, South Africa

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## ABSTRACT

**Background** Concurrent sexual relationships facilitate the spread of HIV infection, and sex with non-primary partners may pose particularly high risks for HIV transmission to primary partners.

**Objective** We examined the sexual and alcohol-related risks associated with sex partners outside of primary relationships among South African men and women in informal drinking establishments.

**Methods** Men (n=4959) and women (n=2367) with primary sex partners residing in a Xhosa-speaking South African township completed anonymous surveys. Logistic regressions tested associations between having outside partners and risks for sexually transmitted infections (STI)/HIV.

**Results** Forty-four percent of men and 26% women with primary sex partners reported also having outside sex partners in the previous month. Condom use with outside partners was inconsistent for men and women; only 19% of men and 12% of women used condoms consistently with outside sex partners. Multivariable regressions for men and women showed that having outside partners was significantly associated with having been diagnosed with an STI, consuming alcohol in greater frequency and quantity, alcohol use during sex, meeting sex partners in alcohol-serving venues, and higher rates of unprotected sex.

**Conclusions** Having outside sex partners was associated with multiple risk factors for HIV infection among South African shebeen patrons. Social and structural interventions that encourage condom use are needed for men and women with outside partners who patronise alcohol-serving venues.

## INTRODUCTION

Countries throughout southern Africa have established generalised HIV epidemics. Multiple sexual partnerships facilitate the rapid spread of HIV infection with potential to amplify generalised epidemics.<sup>1</sup> Mathematical models suggest sexual relationships that overlap in time, or that concurrent partnerships are especially at high risk for HIV transmission.<sup>2–4</sup> Of particular importance for the spread of HIV may be risks posed to primary sex partners of individuals who also have outside partners. Studies in Uganda show that outside partners

are more common among men than women, and that the HIV status of outside partners is often unknown.<sup>5</sup> A study of 15–29-year-olds in Kenya found that 11% of married men and 3% of married women had outside sex partners.<sup>6</sup> Studies have shown that HIV transmission occurs in committed relationships, and risk to primary partners can result from HIV entering the relationship via a third person.<sup>7</sup> Estimates suggest that as many as half of all HIV infections in Africa may occur in stable primary-partnered relationships.<sup>8</sup>

Risks to primary partners may be further amplified because consistent condom use is infrequent in primary relationships. South Africa has one of the world's most significant HIV epidemics, and yet, only 15% of men and 18% of women report consistent or even occasional condom use.<sup>9</sup> Risks to primary partners may, however, be offset by using condoms with outside partners. There is evidence that men with outside partners use condoms more often than men in exclusive primary relationships.<sup>5</sup> However, it remains unclear how condom use varies across primary and non-primary partners.

Informal drinking venues (ie, shebeens), located in urban townships, are important in sexual risks.<sup>10</sup> In South Africa, the majority of shebeen patrons meet sex partners in drinking venues.<sup>11–12</sup> Meeting sex partners in shebeens is associated with having multiple partners and higher rates of unprotected sexual behaviours.<sup>13–14</sup> Drinking venues may, therefore, serve as an intersection between high-risk networks and the general population. Because alcohol use reliably predicts inconsistent condom use,<sup>10</sup> the risks posed to primary partners may also be higher among persons who drink alcohol at shebeens and have outside partners. To our knowledge, there are no previous studies of condom use with concurrent outside sex partners in the context of alcohol-serving venues in southern Africa.

Here we report an anonymous venue-based cross-sectional survey of men and women in current primary relationships who drink in South African shebeens. We focused on sexual behaviours and condom use in both primary and outside partnerships. In addition, we compared sexual risk and



protective behaviours among persons with primary and outside partners with individuals who exclusively had primary partners. We hypothesised that individuals with outside sex partners would demonstrate higher sexual risks, including greater rates of unprotected sex and alcohol use during sex.

## METHODS

### Participants

Participants were 7326 residents (4959 men, 2367 women) in 10 sections of three primarily Xhosa-speaking townships just outside Cape Town, South Africa. All participants were aged 18 years or older (median=30, IQR 50). Nearly all (98%) participants identified as Black African, 51% were unemployed and 50% had not matriculated school.

### Research setting and procedures

The townships that participated in the current study were located 20 km from Cape Town's central business district. Residents were primarily of Xhosa cultural heritage. Neighbourhoods were defined as areas approximately ½ km wide that contained at least one informal shebeen. We used methods described by Weir *et al*<sup>11 12</sup> to perform rapid community assessments, and identified 10 shebeens separated by at least 1 km from each other. We selected shebeens that served at least 75 patrons per week. Field workers that conducted the surveys were eight indigenous men and women from communities similar to our selected townships and spoke both Xhosa and English.

Participants were approached individually and asked to complete anonymous surveys. All men and women aged 18 years and older were eligible for the study. Participants were surveyed inside the shebeen (84%) and on the adjacent street (16%) of the selected alcohol-serving establishments. All participants surveyed outside the venues indicated that they did drink at a shebeen during the previous month. Participants who agreed (95%) were given a nine-page self-administered anonymous survey that required 15–20 min to complete. Participants were compensated with a keychain or shopping bag for taking the time to complete the survey. Surveys were printed in English and Xhosa. Verbal consent was obtained to avoid collecting participants' names at any time. Participants were provided with assistance by field workers when needed (<5%). Surveys were not reviewed in the field, and names were not collected to protect participant anonymity. Data collection occurred between 2009 and 2012, and the institutional review boards of the University of Connecticut, Brown University and the Human Sciences Research Council of South Africa approved the procedures.

### Measures

Participants were asked to report demographic characteristics, alcohol use, shebeen attendance, HIV risk history and sexual behaviours.

### Demographic and health characteristics

Participants reported their age, race, cultural heritage, education, marital status and employment status. Participants also indicated if they had been treated for an STI and whether they had been tested for HIV and, if so, their most recent test result.

### Alcohol use

Frequency of drinking was measured by asking participants how often they drank alcohol in the past month. This measure defined a standard alcohol drink as a single shot of spirits,

340 ml bottle/glass of beer, one bottle of cider or one glass of wine. Frequency of binge drinking was assessed by asking participants the number of times in the past month they drank five or more drinks on one occasion, as well as an item asking how often they drank enough to feel intoxicated. Responses included (a) nearly every day, (b) 3–4 times a week, (c) 1–2 times a week, (d) monthly.

### Alcohol use in relation to sexual behaviour

Participants reported the number of times in the previous month that they drank alcohol before having sex, and the number of times they had a sex partner who drank alcohol before having sex. Open-response formats were used to indicate the number of events. Participants also reported whether they had met a sex partner at a shebeen in the previous month.

### Primary and outside sex partners

Separate items asked participants (a) whether they currently had a primary or main sex partner and (b) whether they currently had a casual/outside sex partner (yes or no). Participants were asked to indicate how often they use condoms with their primary partner. Responses indicated: never, half the time, less than half the time, more than half the time and always. The same measure was repeated to assess condom use with outside partners.

### Sexual behaviors

Participants reported the number of male and female sex partners they had in the past month, and the number of specific sex acts in which they engaged (vaginal and anal intercourse with and without condoms). All the sex behaviour questions were asked with regard to the past month (30 days) and used open-response formats, where participants wrote a number in a blank space. We selected a 1-month time frame and open-response formats to improve recall accuracy, and to provide unanchored responses.<sup>15</sup> We calculated the percentage of occasions of intercourse protected by condoms for vaginal and anal intercourse separately. Consistent condom use was defined as using a condom during every (100%) occasion of intercourse in the time frame.

### Data analyses

We examined demographic characteristics, alcohol use and sexual practices among men and women who reported outside sexual partners in the past month compared with men and women who only reported having a primary sex partner in the past month. Sample size was estimated by the expected prevalence rates of outside sex partners based on previous research. We first compared relationship groups on demographic characteristics followed by comparisons for alcohol use and sexual behaviours. We also performed logistic regression analyses with relationship groups as the independent variable, and separately for men and women, to test our hypothesis that multiple independent risk behaviours would differentiate the relationship groups. Multivariable models simultaneously tested non-overlapping factors, again separately for men and women that were found significantly ( $p < 0.05$ ) associated with having outside partners in bivariate models. Multivariable models report ORs adjusted for all variables in the model. Analyses used a complete case approach to missing values (<5% missing on any variable).<sup>16</sup> Results report ORs with 95% CIs.

## RESULTS

Results showed 1097 (15%) participants did not report any sex partners in the previous month, and were excluded from further analyses. Among sexually active men, 95% (3986/4220) reported a primary sex partner; 27% (1075/3986) of these men reported that they were married. Similar results were found for women, with 95% (1788/1882) reporting primary partners, of whom 24% (434/1788) were married. The remaining analyses only included the 3986 men and 1788 women who had primary partners. Demographic and health characteristics of men and women who had outside sex partners compared with men and women who had only primary sex partners are shown in table 1. Men who had outside sex partners were younger, had fewer years of education, were more likely to have been diagnosed with an STI, were less likely to have tested HIV negative, and more likely to not know their HIV status. For women, those who had outside partners were more likely to have been diagnosed with an STI, and were less likely to know their HIV status.

### Alcohol use

As expected, given the study venues, alcohol use was common in this sample. In addition, alcohol use was more frequent, heavier and more likely to reach levels of intoxication among men and women who had outside partners. (see table 2) More than one in four men and women with outside partners reported meeting a sex partner at a shebeen in the previous month. For men and women, having outside sex partners was associated with the participant as well as their sex partners drinking alcohol before sex.

### Condom use with primary and outside partners

For men, 2495 (63%) used condoms less than half the time they had sex with their primary partner, 396 (10%) used condoms most of the time and 1088 (27%) used condoms consistently with their primary partners. For women, 1050 (62%) used condoms less than half the time they had sex with their primary partner, 197 (11%) used condoms most of the time

and 538 (33%) used condoms consistently with their primary partners.

A total of 1750 (44%) men and 464 (26%) women reported having outside sex partners in the previous month, a statistically significant difference,  $X^2(df=1, n=5774)=168.27$   $p<0.001$ . Among men with outside partners, 1082 (62%) had two partners, 364 (21%) had three partners and 304 (17%) had four or more partners in the past month. Table 3 shows the condom use behaviours of men and women in exclusive and non-exclusive relationships. Among men with outside sex partners, 1141 (65%) used condoms less than half the time with their primary partners, 198 (11%) used condoms most of the time and 411 (24%) used condoms consistently with their primary partners. By contrast, 481 (29%) used condoms less than half the time with outside sex partners, 211 (13%) used condoms most of the time and 987 (58%) used condoms consistently with outside partners. In total, 379 (19%) men used condoms consistently with both primary and outside sex partners.

Among women who had outside partners, 297 (64%) had two partners, 67 (14%) had three and 100 (22%) had four or more partners in the past month. Among women with outside partners, 317 (69%) used condoms less than half the time with their primary partners, 53 (11%) used condoms most of the time and 93 (20%) used condoms consistently with primary partners. By contrast, 166 (37%) used condoms less than half the time with their outside partners, 60 (14%) used condoms most of the time and 213 (49%) used condoms consistently with outside partners. In total, 80 (12%) women used condoms consistently with their primary and outside sex partners.

### Sexual behaviours

Men with outside partners reported higher rates of unprotected vaginal and anal intercourse, but more frequent use of condoms in the past month compared with men with only primary partners (see table 3). By contrast, women with outside partners only indicated higher rates of unprotected vaginal and anal intercourse, with no association between partner groups and condom use.

**Table 1** Demographic characteristics of primary-partnered men and women who do not report outside partners and those who do

	Men				OR	95% CI	Women				OR	95% CI
	Primary partner only (n=2236)		Primary and outside partners (n=1750)				Primary partner only (n=1324)		Primary and outside partners (n=464)			
	n	%	n	%			n	%	n	%		
Employed	1271	57	957	55	1.08	0.96 to 1.23	623	47	198	42	1.19	0.96 to 1.48
Education												
<11 Grade	1155	51	776	40	Reference		571	43	230	50	Reference	
Grade 11	792	36	762	44	0.91	0.75 to 1.12	555	42	169	37	1.23	0.89 to 1.70
Higher												
Education	285	13	209	12	1.32**	1.07 to 1.61	196	15	64	14	0.93	0.67 to 1.29
STI history	930	42	824	47	1.25**	1.10 to 1.41	458	35	256	55	2.32**	1.87 to 2.88
HIV tested	1623	73	1232	71	1.10	0.96 to 1.27	1075	81	361	78	1.24	0.96 to 1.61
HIV status												
HIV+	84	5	57	4	Reference		82	7	51	12	Reference	
HIV-	1478	85	1078	74	0.36**	0.21 to 0.61	968	84	290	67	0.98	0.44 to 2.19
Unknown	150	9	268	18	0.39**	0.25 to 0.59	81	7	83	19	0.47*	0.23 to 0.98
Refused	34	2	64	4	0.95	0.59 to 1.50	19	2	13	3	1.62	0.74 to 3.55
	M	SD	M	SD			M	SD	M	SD		
Age	33.6	9.9	30.3	8.2	0.96**	0.95 to 0.97	30.7	11.6	29.9	7.4	0.99	0.97 to 1.00

Note: \*\*  $p<0.01$

**Table 2** Alcohol use among primary-partnered men and women who do not report outside partners and those who do

	Men						Women					
	Primary partner only (n=2236)		Primary and outside partners (n=1750)		OR	95% CI	Primary partner only (n=1324)		Primary and outside partners (n=464)		OR	95% CI
	M	SD	M	SD			M	SD	M	SD		
Drinking frequency	2.81	1.84	3.58	1.72	1.26**	1.22 to 1.31	1.70	1.90	2.86	1.95	1.34**	1.27 to 1.41
Consumes 5+ drinks	2.04	1.88	2.65	1.85	1.18**	1.14 to 1.22	1.22	1.69	2.43	1.87	1.42**	1.34 to 1.51
Drinks to intoxication	0.90	1.44	1.65	1.68	1.35**	1.29 to 1.40	0.46	1.09	1.31	1.60	1.55**	1.44 to 1.68
Drank before sex*	1.8	3.5	5.9	9.1	1.18**	1.16 to 1.21	1.1	11.7	5.1	7.7	1.23**	1.19 to 1.27
Partner drank before sex*	0.5	1.8	2.7	6.2	1.40**	1.34 to 1.46	1.8	3.5	6.3	7.9	1.19**	1.16 to 1.22
	N	%	N	%			N	%	N	%		
Met partner in shebeen*	174	8	513	29	4.91**	4.08 to 5.92	59	5	109	24	6.60**	4.70 to 9.25

\*past 30 days; \*\* p&lt;0.01

**Multivariable models**

Logistic regressions comparing individuals with only primary sex partners with those with outside partners, for men and women separately, are shown in table 4. For men, having outside partners was significantly associated with younger age, greater education, having been diagnosed with an STI, alcohol use in relation to sex, meeting sex partners in shebeens and higher rates of unprotected vaginal intercourse. For women, results were similar; having outside partners was associated with STI diagnosis, alcohol use, alcohol use in sexual contexts, meeting partners in shebeens and unprotected vaginal and anal intercourse.

**DISCUSSION**

The current study found that 44% of primary-partnered men and 26% of primary-partnered women surveyed in informal drinking venues reported outside sex partners in the previous month. Having outside sex partners was associated with multiple risk factors for HIV infection, including having been diagnosed with an STI and higher rates of unprotected sex. Having multiple partners was also associated with greater use of alcohol, as well as greater use of alcohol by participants and their partners before sex. In addition, one in four men and women shebeen patrons with outside partners had recently met sex partners at drinking venues. These results confirm our study hypothesis, demonstrating that

**Table 3** Sexual behaviours and condom use among primary-partnered men and women who do not report outside partners and those who do

	Men						Women					
	Primary partner only (n=2236)		Primary and outside partners (n=1750)		OR	95% CI	Primary partner only (n=1324)		Primary and outside partners (n=464)		OR	95% CI
	M	SD	M	SD			M	SD	M	SD		
Unprotected vaginal intercourse	5.7	6.3	7.9	12.7	1.04**	1.03 to 1.05	5.5	6.6	9.2	8.9	1.06**	1.05 to 1.07
% Condom use												
Vaginal sex	40.9	45.3	56.1	35.0	2.40**	2.05 to 2.81	46.9	45.0	49.9	32.7	1.06	0.81 to 1.39
Unprotected anal intercourse	0.2	1.5	0.6	3.5	1.11**	1.06 to 1.16	0.2	1.1	0.6	2.6	1.15**	1.07 to 1.22
% Condom use												
Anal sex	60.3	46.6	66.2	39.2	1.39	0.87 to 2.20	52.2	46.5	39.6	41.1	0.52	0.25 to 1.10
Total % condom use												
Use	41.6	45.3	56.5	34.7	2.37**	2.03 to 2.77	46.9	44.9	49.8	32.7	1.18	0.92 to 1.52
	N	%	N	%			N	%	N	%		
Condom use with primary partner												
Never	1311	58	1066	61			695	52	288	63		
<Half the time	50	2	75	4			40	3	29	6		
>Half the time	198	9	198	11			144	11	53	11		
Always	667	31	411	24	1.08**	1.03 to 1.13	445	34	93	20	1.22**	1.13 to 1.33
Condom use with outside partners												
Never	N/A		430	26			N/A		147	33		
<Half the time	N/A		51	3			N/A		19	4		
>Half the time	N/A		211	13			N/A		60	14		
Always	N/A		987	58	N/A		N/A		213	49	N/A	

Note: n's vary due to missing data; means and SDs for continuous sexual and condom use behaviours across partners in the past 30 days; ; \*\* p&lt;0.01; N/A=not applicable

**Table 4** Multivariate models of associations with having outside partners among men and women

	Adjusted	
	OR	95% CI
<b>Men</b>		
Age	0.96**	0.95 to 0.97
Education	1.24**	1.11 to 1.37
STI	1.16*	1.01 to 1.34
Binge drinking	1.01	0.96 to 1.04
Drank before sex	1.11**	1.08 to 1.13
Partner drank before sex	1.20**	1.15 to 1.25
Met partner in shebeen	3.62**	2.93 to 4.47
Unprotected vaginal Sex	1.02**	1.01 to 1.03
Unprotected anal sex	1.04	0.99 to 1.08
<b>Women</b>		
Age	0.99	0.97 to 1.00
Employed	1.21	0.93 to 1.57
STI	2.09**	1.62 to 2.69
Binge drinking	1.20**	1.06 to 1.36
Drank before sex	1.10**	1.06 to 1.15
Partner drank before sex	1.08**	1.04 to 1.12
Met partners in shebeens	3.80**	2.57 to 5.62
Unprotected vaginal sex	1.02**	1.01 to 1.03
Unprotected anal sex	1.08*	1.01 to 1.16

Note: Adjusted OR adjusted for all variables in the model; \*p<0.05, \*\*p<0.01.

individuals who had outside sex partners in the previous month were at higher sexual risk in general, and posed a particularly high risk to their primary sex partners.

Although men and women showed similar associations between having outside partners with sexual risk and alcohol use behaviours, there were gender differences. In particular, men with outside partners reported greater condom use than exclusively primary-partnered men. This result was not surprising given the higher risk posed by multiple partners, and past research showing that condom use is more frequent with non-primary sex partners.<sup>17–19</sup> The higher rates of condom use among men with outside partners may offset the risk posed to their primary partners. By contrast, an association between condom use and outside partners was not observed for women. Gender inequities are another well-known correlate of sexual risks for women in South Africa.<sup>8</sup> Because condom use depends on men either using condoms or cooperating with women's use of female condoms, interventions that target men are essential to lowering women's risks for STI and HIV.<sup>20–22</sup>

The current findings should be interpreted in light of the study limitations. This research relied on self-reports, which can be vulnerable to bias given the private and socially stigmatised behaviours of interest. Thus, it is possible that some men and women did not report multiple sexual relationships and were misclassified as exclusively primary-partnered. It is also possible that participants differed in how they defined the meaning of casual partners. The prevalence of multiple sex partners is, therefore, likely to be higher than reported here, and the differences between groups may be stronger than we found. We also relied on a recall period of 1 month, increasing the chance of missing co-occurring relationships that may have fallen outside this time frame. Another limitation was not collecting partner relationship information for our continuous sexual behaviour measures. Our sample was also drawn by convenience and cannot be considered representative of Cape Town shebeens or residents.

Alcohol-serving establishments offer opportune venues for targeted STI/HIV prevention interventions in southern Africa. We found that 44% and 26% of primary-partnered men and women, respectively, reported recent outside relationship sex partners. Replicating past research,<sup>11</sup> these high rates of multiple partners are greater than those reported in other settings.<sup>23–24</sup> Interventions delivered at drinking venues have been effective in other countries and may be culturally adaptable for use in South Africa. For example, a multilevel peer counselling and social influence on HIV risk reduction that targeted female sex workers in drinking venues in the Philippines included manager training to reinforce employee health and health improvement programmes for women.<sup>25</sup> Results showed significant increases in condom use at last sex, and reductions in STI compared with control sites.<sup>26</sup> Similar structural interventions that encourage venue owners to institute health programmes may be effective in shebeens. A positive indicator that such interventions may be adapted for South Africa is the degree of cooperation we experienced from shebeen owners and employees in this study. In addition, we observed men using condoms more with outside partners, suggesting intentions to reduce STI risks. These strengths can be built on to implement structural interventions. Future research is needed to determine the degree to which behavioural intentions to meet outside sex partners at shebeens influence risk and risk-reduction practices. Better understanding of behavioural intentions, as well as behaviour change, will help inform social and structural interventions.

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### Key messages

- ▶ Alcohol-serving venues in South Africa are high-risk settings for HIV infection.
- ▶ Having outside sex partners is associated with multiple risk factors for HIV infection, particularly to primary partners.
- ▶ Interventions that discourage partner concurrency and encourage condom use are needed for men and women with outside partners who patronise alcohol-serving venues.

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