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Heterosexual Anal Intercourse among Community and Clinical Settings in Cape Town, South Africa

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Abstract

Background—Anal intercourse is an efficient mode of HIV transmission and may play a role in heterosexual HIV epidemics of southern Africa. However, little information is available on the anal sex practices of heterosexuals in South Africa.

Purpose—To examine the occurrence of anal intercourse in samples drawn from community and clinic settings.

Methods—Anonymous surveys collected from convenience samples of 2593 men and 1818 women in two townships and one large city STI clinic in Cape Town. Measures included demographics, HIV risk history, substance use, and three month retrospective sexual behavior.

Results—A total of 14% (n = 360) men and 10% (n = 172) women reported engaging in anal intercourse in the past three months. Men used condoms during 67% and women 50% of anal intercourse occasions. Anal intercourse was associated with younger age, being unmarried, having a history of STIs, exchanging sex, using substances, having been tested for HIV, and testing HIV positive.

Conclusions—Anal intercourse is reported relatively less frequently than unprotected vaginal intercourse among heterosexuals. The low prevalence of anal intercourse among heterosexuals may be offset by its greater efficiency for transmitting HIV. Anal sex should be discussed in heterosexual HIV prevention programming.

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Author Contributions
Seth C. Kalichman conceptualized the study, analyzed the data, and prepared the manuscript.
Leickness C. Simbayi contributed substantially to the conceptualization of the study and preparation of the manuscript.
Demetria Cain and Sean Jooste contributed substantially to the conceptualization of the study, data management and integrity, and execution of the research.

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Keywords

HIV; AIDS; risk behavior. anal intercourse; disease prevention

Heterosexually transmitted HIV infection has resulted in the catastrophic AIDS epidemic in southern Africa. For the most part, vaginal intercourse accounts for Africa's HIV infections and penile-vaginal HIV transmission is facilitated by several known cofactors, including sexual concurrency (e.g., multiple sexual partners within brief time periods), intergenerational sexual relationships (e.g., older men with multiple younger female partners), and co-epidemics of other sexually transmitted infections (STI). The synergy of multiple co-factors further increases the efficiency of vaginal sexually transmitted HIV by promoting both infectiousness of source partners and susceptibility of uninfected partners. Penile-anal intercourse is more efficient in transmitting HIV than vaginal intercourse (1). Although heterosexual anal intercourse carries considerable risk for HIV transmission, the prevalence of anal sex among heterosexuals is not well established.

Anal intercourse is typically associated with HIV transmission in male homosexual relationships with relatively little attention given to the potential risks of anal intercourse in heterosexual relationships (2). Recent research, however, has turned attention toward the prevalence and practices of anal intercourse among heterosexuals. For example, a national survey of men and women in the US found that 35% of adults had engaged in anal intercourse in their lifetime (3). A study of 1348 adolescents and young adults aged 15 to 21 years old sampled in three US cities found that 16% had engaged in heterosexual anal intercourse over the previous three months (4). Among young women, engaging in anal sex was associated with living with a sex partner, having had two or more sex partners, and having experienced coercive sex. For young men, only gay and bisexual orientations were significant predictors of engaging in heterosexual anal intercourse. Research on substance using populations in the US has found a 30-day prevalence of heterosexual anal intercourse between 5% and 8%, with higher rates of anal sex associated with greater alcohol and drug use (5). One in five women at high risk for HIV infection in New York City engage in anal intercourse with regular, casual, and commercial sex partners (6). In addition, substance users who engage in anal intercourse are more likely to have contracted STI in general, although not HIV in particular. Heterosexual anal sex is prevalent among STI clinic patients, with more than one in five patients reporting anal sex in the previous three months, and 39% reporting anal intercourse in the past year (7). These findings are consistent with other studies that show a significant and potentially growing number of heterosexuals engaging anal sex practices (8–9). Although all studies report substantially higher rates of vaginal intercourse than anal intercourse among heterosexuals, the significantly greater transmission efficiency of anal intercourse may translate to an important role of anal sex in heterosexually transmitted HIV.

The current study examined heterosexual anal intercourse practices among men and women in South Africa. HIV is a generalized epidemic in South Africa, with as many as one in five South Africans living in urban townships and informal settlements infected with HIV (10). Heterosexually transmitted HIV accounts for the vast majority of HIV infections in South Africa. However, the relative importance of vaginal and anal intercourse in accounting for HIV/AIDS in South Africa is not known. In one of only a few empirical studies, Lane et al. (11) found that 3.6% of men and women had engaged in heterosexual anal intercourse in their lifetimes, with rates for youth greater than 5%. These findings suggest that anal sex may be relatively rare in South Africa. However, the paucity of research calls for additional studies to examine heterosexual anal intercourse among South African adults. The purpose of the present study was to investigate heterosexual anal sex and associated factors in two

population segments of Cape Town South Africa: (a) men and women living in urban townships and (b) men and women receiving STI clinic services. Our primary aim was to describe the occurrence of heterosexual anal intercourse in relation to vaginal intercourse, condom use, and risk-related history factors.

Methods

Participants

Participants were recruited from urban townships (N=3051, 69%) and an urban STI clinic (N=1360, 31%) in Cape Town. Cape Town is a racially diverse city of 3.2 million people; 31% black/African, 48% Coloured (mixed race), 19% white, and 2% Indian/Asian. The township communities that participated are located within 20 kilometers of Cape Town's central business district. One township is nearly exclusively populated by Black South Africans of Xhosa cultural heritage and the other was historically populated by Coloured persons during the apartheid era and is among the first townships to racially integrate in Cape Town with large numbers of indigenous Africans moving into the township. We also collected data from an STI clinic located in Cape Town that treats over 1800 patients each month. Approximately half of all patients seen at the clinic have previously received STI diagnostic and treatment services.

Measures

Surveys were administered in English, Xhosa (an indigenous African language), and Afrikaans (a former South African national languages rooted in Dutch). All measures were translated using back translation procedures. The survey included demographic and HIV risk history characteristics, substance use, and sexual behaviors.

Demographic and HIV risk history characteristics—Participants reported their age, race, years of formal education, whether they were employed and their marital status. To assess HIV risk history, participants were asked if they had ever used condoms in their lifetime, whether they had ever exchanged sex for money, a place to stay, or material goods, and their lifetime history of STI diagnoses. Participants also reported whether they had ever been tested for HIV and if they had been tested, they were asked their most recent HIV test result. Participants indicated whether they had used alcohol, cannabis (dagga), and other drugs in the previous three months.

Sexual behaviors—Participants reported their number of male and female sex partners and frequency of sexual acts, including vaginal and anal intercourse with and without condoms in the previous three months. Participants were instructed to think back over the past 90 days (3 months) and estimate the number of male and female sex partners they had and the number of occasions in which they practiced vaginal and anal sexual behaviors with and without condoms. These measures are similar to others that have been found reliable and valid in previous research (12). We calculated the proportion of intercourse occasions protected by condoms separately for vaginal and anal intercourse (protected acts / total acts). We also computed the proportion of all sexual intercourse occasions accounted for by anal intercourse (anal intercourse / total intercourse).

Sampling procedure

Data were collected using time and place sampling procedures in two townships and a major STI clinic in Cape Town. The township samples were obtained through venue-based survey procedures. In each township men and women age 18 and older were approached while in public places and asked to complete a brief anonymous survey. Field workers were instructed to approach the next person they saw as their participants completed surveys. The

37 venues sampled across the two townships included day hospitals (12% of community surveys), shopping areas (21%), community centers (25%), taxi waiting areas (18%), and street junctions that included bus stops, waiting areas, and street vendors (24%). These venues were purposely selected because they represent public access sites throughout the townships and their surrounding areas. Questionnaires were administered by teams of field workers recruited from the townships and trained in survey collection, the study protocol, and research ethics, particularly focusing on confidentiality. Sampling occurred throughout hours of the day and days of the week. Participants were approached by a field worker and asked whether they would answer an anonymous questionnaire. More than 90% of persons approached agreed to complete surveys.

Participants in the STI clinic sample were recruited to complete anonymous surveys of sexual behavior and health at a Cape Town public health clinic. Potential participants were referred to the study recruiter by their doctor or nurse following their STI diagnostic and treatment services; 91% of patients referred to the study agreed to complete surveys. All STI patients were referred to the study. Sampling occurred during all hours of clinic operation. The community and clinic anonymous surveys were collected between 2003 and 2006. Ninety-five percent of persons who agreed to complete the survey self-administered the measures with minimal assistance and 5% required that the survey be read to them. When assisting participants, field workers read the survey items to participants who completed their own responses on their survey. All participants received 15 South African Rand ($3US) to compensate for their time. All of the study procedures were approved by the University of Connecticut and Human Sciences Research Council institutional review boards.

Data analyses

We conducted analyses on three partitions of the data to examine rates of sexual behavior and related factors. First, we compared the township and clinic patient samples on sexual partners, sexual behaviors and condom use. Second, we tested for differences between participants who engaged in heterosexual anal intercourse in the previous three months with those who did not report heterosexual anal sex on all demographic, HIV risk history, substance use and sexual behaviors. Finally, we examined sexual partners and sexual behaviors of men and women who had engaged in heterosexual anal sex in the previous three months. All comparisons were conducted using logistic regressions. We report odds ratios, significance values, and 95% confidence intervals (95%CI). Because of the large sample size and exploratory nature of this study, statistical significance was defined at the conservative level of $p < .01$.

Results

Among the 2769 men surveyed 176 (6%) reported same sex partners in the previous three months, of which 51% had engaged in anal intercourse. To avoid confounding heterosexual anal intercourse with same sex anal intercourse we omitted the 176 men who had sex with men from further analyses. The final sample consisted of 2593 men and 1818 women who reported a total of 3859 and 2655 opposite sex partners in the past three months, respectively. The median age of participants was 30 years; 64% of participants were Black/African and 32% self-identified as Coloured or mixed race; 43% were currently working; and 32% were married or living with a sex partner. A total of 360 (14%) men and 172 (10%) women reported anal intercourse in the previous three months; 44% of participants who engaged in anal sex did so for less than half of all intercourse occasions, 28% engaged in anal intercourse half the time and the remaining 28% engaged in anal intercourse more than half of the time, with 9% (N = 45) reporting exclusively engaging in anal intercourse.

Table 1 shows the demographic, substance use, and sexual behaviors of participants sampled in the township communities and the STI clinic. Categorical variables are shown in the upper panel and continuous variables are shown in the lower panel of the table. The two samples differed along several demographic and risk history characteristics. As expected, STI clinic patients reported significantly more sex partners and frequencies of sexual behaviors in the previous three months compared to community members, with the only exception being the proportion of anal intercourse occasions protected by condoms–for which groups did not differ.

Factors associated with engaging in heterosexual anal sex

Table 2 presents the characteristics and behaviors of the sample partitioned by whether participants had engaged in anal intercourse in the past three months. Controlling for sampling venues, results showed that individuals who practiced heterosexual anal sex were significantly younger, less likely married or living with a sex partner, and more likely to have had a lifetime history of condom use compared to those who did not engage in anal sex. In addition, individuals who practiced anal intercourse were significantly more likely to report a history of all HIV risk factors, including a history of STIs and history of sexual exchange, and were more likely to report alcohol and other substance use in the previous three months. Participants who practiced anal sex were also more likely to have been tested for HIV and were more likely to have tested HIV positive (see Table 2). In terms of other sexual behaviors, individuals who engaged in anal intercourse reported more sex partners than persons who did not engage in this behavior. Practicing anal sex was significantly associated with engaging in less unprotected vaginal intercourse and greater vaginal intercourse protected by condoms.

Gender differences among persons who practiced anal intercourse

Sexual behavior differences reported by men and women who engaged in anal sex are shown in Table 3. Men who engaged in anal intercourse reported more sex partners than women and men also reported greater condom use during vaginal and anal intercourse. Finally, men engaged in proportionally more anal sex relative to vaginal sex than did women.

Discussion

The current study is among the first to examine heterosexual anal intercourse practices in South Africa. The results are consistent with previous research, showing that anal intercourse is practiced at relatively low rates among heterosexual men and women (11). Less than 15% of men and women practice anal sex and even among those who do engage in anal intercourse most do so at significantly lower rates than vaginal intercourse. Condom use during anal intercourse mirrored the rates of condom use for vaginal intercourse and we observed only small differences between community and STI clinic samples in their anal intercourse practices. Engaging in anal intercourse was associated with several common factors for sexual transmission risks of HIV in general, including sexual exchange and substance use. In addition, we found that people who practiced anal sex were more likely to have had an STI diagnosis, were more likely to have been tested for HIV, and more likely to have tested HIV positive. Participants who engaged in anal sex were also more likely to have used condoms in their lifetime and were using condoms at a similar rate for anal and vaginal intercourse at the time of the study. Given these and other findings (10), the HIV epidemic in South Africa cannot be attributed to anal intercourse as some commentators have suggested (12). Of course, the precise role anal intercourse has played in the history of South Africa’s HIV epidemic is unknown. Nevertheless, our data parallels other research

showing that anal intercourse should neither be the focus of nor ignored by HIV prevention interventions in South Africa.

The current findings should be interpreted in light of the study methodological limitations. Our study concentrated on self-reports of sexual practices and substance use as well as HIV risk history factors. These behaviors are private and several are socially stigmatized and therefore subject to underreporting. We cannot rule out the possibility that some men did not report same sex relationships and were included in the sample. It is also possible that participants confused the meaning of vaginal and anal sex, mistakenly reporting or not reporting the occurrence of anal sex. For example, it is possible that some participants mistakenly reported rear-entry vaginal intercourse as anal intercourse and vice versa. We also relied on a retrospective recall period of three months which can result in inaccurate estimates of higher frequency behaviors (11). The current study measures did not ask about motivations for practicing anal intercourse, such as to maintain vaginal virginity or to avoid pregnancy. Our samples were also drawn by convenience and cannot be considered representative of Cape Town communities. Finally, our study requires replication and confirmation before drawing firm conclusions. Despite these limitations, we believe that our findings have important implications for HIV prevention in South Africa.

Behavioral interventions aimed toward heterosexual populations in South Africa should include anal intercourse among their target behaviors for HIV transmission risk reduction. Relative to vaginal intercourse, anal intercourse likely accounts for a small number of Africa's HIV infections. However, ignoring even low rates of this highly efficient means of HIV transmission in a generalized HIV epidemic would be remiss. Including anal intercourse as a target behavior for interventions should not however detract from the importance of reducing risks from vaginal intercourse. Recognizing anal intercourse practices in HIV prevention also calls attention to examining the potential efficacy of anal/rectal microbicides (13). Risk reduction counselors and health educators may require sensitivity training to increase their openness to discussing anal sex with their clients. In addition, interventions that emphasize skills training, such as condom-use skills and sexual communications skills should include both anal and vaginal intercourse risk reduction. Comprehensive HIV risk reduction strategies that include reducing HIV transmission risks incurred during anal intercourse are urgently needed in South Africa.

Key Messages

1. Heterosexual anal intercourse may be an important factor in facilitating HIV transmission risks among a minority of heterosexual men and women in South Africa.
2. Practicing heterosexual anal sex is associated with younger age, being unmarried, a history of STIs, sexual exchange, substance use, and testing HIV positive.
3. HIV prevention interventions for heterosexual men and women in South Africa should address risks for HIV posed by anal intercourse.

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Table 1

Demographic characteristics and sexual behaviors of township communities and STI clinic participants.

	Township Communities		STI Clinic				
Characteristic/behavior	**N**	**%**	**N**	**%**	**OR**	**p**	**95%CI**
Men	1489	49	1104	82			
Women	1562	51	256	18	0.22	.001	0.19–0.25
Black/African	1452	49	1330	98			
Coloured	1438	49	2	< 1			
Other race	49	2	22	1	0.03	.001	0.02–0.05
Unemployed	2068	69	390	29	0.18	.001	0.16–0.21
Married	1105	36	292	22	0.50	.001	0.43–0.58
Never used condoms	1101	34	205	15	5.02	.001	4.27–5.91
History of STI	428	14	604	45	3.96	.001	3.61–4.35
Received money for sex	198	7	55	4	14.3	.001	11.6–17.92
Given money for sex	160	5	76	6	0.18	.001	0.16–0.21
Alcohol use	1581	53	722	53	1.02	.719	0.90–1.16
Cannabis use	629	22	348	26	1.27	.001	1.09–1.48
Other drug use	41	1	16	1	0.83	.549	0.46–1.49
Tested for HIV	1269	43	544	40	0.90	.120	0.79–1.02
HIV+ test result	142	9	68	9	1.05	.717	0.78–1.06

	Township Communities		STI Clinic				
	Mean	**SD**	**Mean**	**SD**	**OR**	**p**	**95%CI**
Age	32.3	12.2	28.8	7.8	0.97	.001	0.96–0.97
Number of partners	1.32	1.88	1.96	1.01	1.27	.001	1.21–1.32
Unprotected vaginal intercourse	2.97	8.72	9.95	11.64	1.08	.001	1.07–1.09
Protected vaginal intercourse	2.34	6.37	6.55	9.23	1.09	.001	1.07–1.10
Total vaginal intercourse	5.21	11.55	16.46	14.16	1.08	.001	1.07–1.09
% condoms vaginal intercourse	46.29	40.23	41.25	34.24	0.70	.001	0.58–0.85
Unprotected anal intercourse	0.31	2.47	0.64	3.96	1.03	.002	1.01–1.06
Protected anal intercourse	0.52	3.65	1.01	4.93	1.02	.001	1.01–1.04
Total anal intercourse	0.82	4.65	1.64	7.90	1.02	.001	1.01–1.03

	Township Communities		STI Clinic				
	Mean	SD	Mean	SD	OR	p	95%CI
% condoms anal intercourse	61.96	39.60	59.99	36.43	0.87	.586	0.54–1.40

Note: All sex behaviors reported for the past three months; analyses controlling for community/clinic sample.

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Table 2

Characteristics and behaviors of persons who did not and did engage in anal intercourse.

	Did not engage in anal intercourse		Engaged in anal intercourse				
Characteristic	**N**	**%**	**N**	**%**	**OR**	**p**	**95%CI**
Men	2111	59	360	68	ref		
Women	1474	41	172	32	0.84	.114	0.11–0.84
Black	2306	66	422	82	ref		
Coloured	1150	33	83	16	0.78	.376	0.65–3.18
Other race	52	1	7	2	0.46	.071	0.20–1.06
Not employed	1973	56	311	59	1.16	.827	0.94–1.41
Married/living with partner	1147	32	122	23	0.62	.001	0.50–0.77
Never used a condom	1011	29	72	14	1.79	.001	1.49–2.17
History of STI	837	24	167	32	1.64	.001	1.46–1.85
Received material for sex	174	5	66	12	1.77	.001	1.57–1.99
Given material for sex	180	5	52	10	1.70	.001	1.51–1.90
Alcohol use	1835	52	365	70	2.16	.001	1.77–2.63
Cannabis use	760	22	181	35	1.97	.001	1.62–2.40
Other drugs	34	1	14	2	2.84	.001	1.51–5.34
Tested for HIV	1479	42	266	51	1.44	.001	1.19–1.73
Tested HIV+	136	9	61	22	2.62	.001	1.89–3.63

	Did not engage in anal intercourse		Engaged in anal intercourse				
Characteristic	**Mean**	**SD**	**Mean**	**SD**	**OR**	**p**	**95%CI**
Age	31.3	11.2	28.9	10.8	0.97	.001	0.96–0.98
Number of sex partners	1.4	1.46	2.3	2.6	1.26	.001	1.20–1.32
Unprotected vaginal intercourse	5.5	10.5	3.5	9.0	0.97	.001	0.94–0.98
Vaginal intercourse with condoms	3.3	6.8	6.5	11.5	1.04	.001	1.03–1.05
Total vaginal intercourse	8.8	13.2	9.9	15.8	1.01	.039	1.00–1.01
Percent condom use during vaginal intercourse	40.2	37.4	65.2	33.7	5.61	.001	4.27–7.37

Note: SD= standard deviation; All sex behaviors reported for the past three months; all comparisons control for sampling venue.

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Table 3

Characteristics of women and men who reported anal intercourse in the past three months.

	Women (N = 172)				Men (N = 360)						
Behavior	**Sum**	**Median**	**Mean**	**SD**	**Sum**	**Median**	**Mean**	**SD**	**OR**	**p**	**95%CI**
Number of sex partners	296	1	1.73	1.51	936	2	2.60	3.05	1.24	.001	110–1.40
Unprotected vaginal intercourse	767	2	4.56	10.41	1084	1	3.04	8.26	0.98	.064	0.96–1.00
Protected vaginal intercourse	846	3	5.03	7.77	2568	3	7.15	12.83	1.01	.125	0.99–1.03
Total vaginal intercourse	1613	5	9.43	13.66	3652	5	10.14	16.81	1.00	.942	0.98–1.01
% condoms vaginal intercourse		57	57.34	33.27		80	69.13	33.36	2.69	.001	1.53–4.72
Unprotected anal intercourse	614	1	3.61	9.49	1106	1	3.11	7.08	0.99	.310	0.97–1.01
Protected anal intercourse	543	1	3.21	5.97	2241	3	6.27	11.79	1.05	.006	1.01–1.08
Total anal intercourse	1157	3	6.72	12.51	3347	4	9.29	15.28	1.01	.127	0.99–1.02
% condoms anal intercourse		50	54.69	39.07		75	64.49	38.02	1.94	.006	1.21–3.12
% intercourse that was anal		42	42.66	21.46		50	51.11	23.48	5.52	.001	2.32–13.12

Note: SD= standard deviation; All sex behaviors reported for the past three months; all comparisons control for sampling venue.