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Beyond Anal Sex: Sexual Practices among MSM and Associations with HIV and Other Sexually Transmitted Infections

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Abstract

Aim—Unprotected anal intercourse is often used as a single indicator of risky behavior among men who have sex with men (MSM), yet MSM engage in a variety of behaviors which have unknown associations with sexually transmitted infection (STI) and HIV. We assessed the prevalence of a wide range of sexual behaviors as well as their associations with prevalent STI and HIV.

Methods—We used a standardized, self-administered survey to collect behavioral data for this cross-sectional study of 235 MSM seeking care in a public STD clinic. Using modified Poisson regression, we generated unadjusted and adjusted prevalence ratios (PRs) to characterize associations between recent participation in each behavior and prevalent STI and HIV.

Results—Participants' median age was 26 years. One-third (35%) were STI-positive. STI prevalence was significantly associated with using sex slings (adjusted prevalence ratio (aPR): 2.35), felching (aPR: 2.22), group sex (aPR: 1.86), fisting (aPR: 1.78), anonymous sex (aPR: 1.51), and sex toys (aPR: 1.46). HIV prevalence was 17% and was significantly associated with fisting (aPR: 4.75), felching (aPR: 4.22), enemas (aPR: 3.65), and group sex (aPR: 1.92).

Conclusions—Multiple behaviors were significantly associated with prevalent STI and HIV in adjusted analyses. To provide a more comprehensive understanding of sexual risk among MSM, prospective studies are needed to examine whether these behaviors are causally associated with HIV/STI acquisition.

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Keywords

Male; Homosexuality; Gonorrhea; Chlamydia; HIV; Syphilis; Sexual Behavior; MSM; Sexually Transmitted Infections; Sexual Health

INTRODUCTION

Men who have sex with men (MSM) are particularly susceptible to acquisition of HIV and other sexually transmitted infections (STI) in the United States (US).^{1–3} Three-quarters of primary and secondary syphilis cases³, along with 22% of gonorrhea cases⁴ and two-thirds of HIV diagnoses⁵, in the US are among MSM. As such, the National HIV/AIDS Strategy for the US has identified sexual practices of MSM as a topic in need of additional high-quality research.⁶

Sexual health research among MSM frequently relies on unprotected anal intercourse (UAI) as a proxy for overall risky sexual behavior.^{7–10} While UAI is an efficient mode of HIV transmission¹¹ and, thus, a risky sexual practice, it may also be a flawed singular measure to characterize a risky profile. In some scenarios, men who practice UAI have zero risk of HIV/STI acquisition: a disease-free man in a mutually monogamous relationship with another disease-free man will not acquire infection through UAI. Conversely, men who eschew UAI and engage in other sexual practices may still be at risk for infection. Self-reported UAI is also often relied upon to direct clinical testing and care.^{12–13} For example, recent HIV pre-exposure prophylaxis (PrEP) guidelines from the US Public Health Service use UAI in a non-monogamous relationship as the only behavioral marker of risk for MSM.¹² Classifying MSM based only on participation in UAI may be flawed and may induce both misclassification bias in research results and missed opportunities for intervention in clinical care. HIV-negative MSM who did not report UAI account for 34% of rectal gonorrhea infections and 36% of rectal chlamydia infections.¹⁴ While this may be at least partially attributable to misreporting of UAI, it highlights the limitation of using UAI as a singular screening measure. It is plausible that other behaviors practiced by MSM, alone or in conjunction with UAI, would be more useful behavioral markers for HIV/STI acquisition risk.

Men participate in different sexual behaviors for a variety of reasons, including sexual desire, sexual orientation, or to reduce the risk of HIV transmission (“seroadaptation”).¹⁵ For example, some men abstain from anal intercourse (AI) entirely to reduce their HIV risk, and instead engage in other sexual behaviors that they perceive to be lower risk.^{16–17} If sexual practices are selected because of perceived lower HIV/STI risk, it is critical to understand whether that perception is accurate. Some sexual behaviors may actually increase risk, either because of a direct risk attached to those behaviors^{18–19} or through their association with other behaviors that are known to increase HIV acquisition²⁰, such as decreased condom use.²¹

Despite the high prevalence of HIV and STI among MSM and some evidence that sexual practices other than AI occur, little is known about the *variety* of sexual behaviors practiced by MSM and associations between those behaviors and HIV/STI. This is especially true for

MSM in the United States (US), as the limited existing research on this topic has occurred in the United Kingdom^{22–23} and Australia.^{13,24} The few studies exploring sexual behaviors among US MSM have typically been conducted in very high-risk groups^{25–26} or very small sample sizes²⁷, limiting their generalizability. Even when US studies have presented data from larger community samples, analyses are generally limited to a single behavior.^{28–29}

AIMS

Increased knowledge of the range of sexual behaviors practiced by MSM and their associations with HIV/STI may contribute to a more accurate definition of “risky sex” and may limit reliance on UAI as the primary marker of high risk behavior.^{7–10} In this study, we aimed to characterize the prevalence of a wide range of sexual behaviors as well as their associations with prevalent STI and HIV.

METHODS

We conducted a cross-sectional study between July 2012 and October 2013 in the sexual health clinic of a major Midwestern metropolitan health department. Study staff screened all men who presented to the clinic for HIV/STI testing for study eligibility. Inclusion criteria included being able to speak and read English, being at least 18 years old, and reporting anal sex (insertive or receptive) with a man in the last year. Eligible men provided written consent, including allowing study staff to access their clinic electronic health record (EHR).

Data Collection

Survey data, which consisted of an interviewer-administered portion and a self-administered portion, were collected using REDCap for electronic data capture.³⁰ The most sensitive questions (covering sexual behaviors) were self-administered. (Surveys available upon request).

We collected behavioral data for two time periods: past three months and lifetime. We assessed many sexual behaviors, including those that are insertive/receptive in nature those that do not involve insertion of fomites in to the mouth, urethra, or rectum, and those that describe environments of sex acts. Insertive/receptive behaviors included unprotected anal intercourse, oral sex, anal fingering, use of insertive sex toys, fisting (inserting a fist in to rectum), sounding (inserting “sound” or catheter in to urethra), and enema use (injecting liquid or gas into the rectum, typically to expel its contents). Non-insertive/receptive behaviors included erotic asphyxiation (restriction of oxygen for purpose of sexual arousal), watersports (use of urine in sexual acts), scatologia (use of feces in sexual acts), snowballing (oral exchange of semen between partners), use of sex sling, felching (sucking semen from partner’s rectum), and rimming (providing anal stimulation with tongue). Other sex acts included group sex and anonymous sex. Definitions of all behaviors are provided in Tables 2 and 3.

MAIN OUTCOME MEASURES

MSM seen at the sexual health clinic where the study was conducted are routinely tested for HIV, syphilis, urethral gonorrhea, and urethral chlamydia. Men who report receptive anal

intercourse in the last year also undergo testing for rectal gonorrhea and chlamydial infection; those who report oral sex are screened for oropharyngeal gonorrhea. HIV is diagnosed by rapid testing on plasma, using Oraquick or Unigold, depending on kit availability. Chlamydia and gonorrhea are diagnosed by nucleic acid amplification testing (NAAT) via Tigris (Genprobe) for rectal and urethral samples; culture is used to test for oropharyngeal gonorrhea. Syphilis is diagnosed through rapid plasma reagin (RPR) (Arlington Scientific) testing and confirmed by *Treponema pallidum* particle agglutination (TP-PA) or fluorescent treponemal antibody absorption (FTA-ABS). Test results are recorded in patients' electronic health records (EHRs); these results were extracted and subsequently linked with survey.

We used *known* HIV status, the HIV status that men believed they had when they completed the questionnaire, in this analysis. We hypothesized *a priori* that behaviors would be affected more by a man's known HIV status than his actual (biological) HIV status. Men were classified as HIV-positive if there was history of a positive HIV test prior to enrollment based on the EHR. Men were classified as not HIV-positive if they had no history of HIV testing or a history of negative HIV test(s) only. Participants were coded as STI-positive if they tested positive for gonorrhea, chlamydia, or primary or secondary syphilis on the date of the interview. If participants tested negative for all infections (gonorrhea, chlamydia, syphilis), they were coded as STI-negative.

Statistical Analyses

Statistical analyses were performed in SAS (Version 9.3, Cary, NC).

We calculated frequencies of participant demographics and prevalence of STI and HIV. We used modified Poisson regression³¹ with robust error variance to estimate unadjusted associations between each sexual practice in the past three months and HIV, and between each practice and prevalent STI. For each relationship, we also calculated an adjusted prevalence ratio (aPR) controlling for age, race, and relationship status (whether participant had a current main partner). For models assessing STI prevalence, each association was calculated for the entire sample and then separately for HIV-positive and HIV-negative participants using a product-interaction term between each behavior and HIV. We defined $\alpha=0.10$ as the threshold for statistical significance of interaction terms.

RESULTS

We screened 1,866 men presenting to the sexual health clinic between July 2012 and October 2013 for study eligibility. The majority of screened men were not eligible because they did not report anal sex with men in the past year (84%, $n=1568$). Of the 1,866 screened, 286 men met eligibility requirements. Fifty-one chose not to enroll due to time constraints or lack of interest, and 235 enrolled in the study.

Demographics

Participants ($n=235$) had a median age of 26 years (interquartile range (IQR): 22–35), and a majority were white (57%). Most had completed at least some college (71%) and were currently employed (73%). Sixty-one percent were not in a committed relationship.

Participants predominantly self-identified as gay (76%) or bisexual (14%). The median number of sexual partners over the lifetime was 25 (IQR: 14–100 partners), very similar to the median number of *male* sexual partners over the lifetime (median: 23, IQR: 11–75 partners) (Table 1).

STI and HIV Prevalence

Across all anatomical sites (urethral, rectal, oral), 18% (95% confidence interval (CI): 13–23%) of men had gonorrhea and 19% (95% CI: 14–24%) were infected with chlamydia. Twelve men (5%) had primary or secondary syphilis. In total, 35% (95% CI: 29–41%) of participants tested positive for gonorrhea, chlamydia, or primary or secondary syphilis infection (Table 1). Forty-one men (17%, 95% CI: 13–22%) knew they were HIV-positive at the time of enrollment (Table 1).

Lifetime Sexual Behaviors

The vast majority of men reported having oral sex (99%) or unprotected anal sex (90%) in their lifetime. Two-thirds (68%) of men reported ever participating in group sex and 58% reported ever having anonymous sex. Lifetime use of insertive sex toys and fisting were reported by 65% and 15%, respectively (Tables 2, 3).

Recent Sexual Behaviors

Oral sex in the past three months was reported by 94% of participants, and 67% reported UAI in the same timeframe. Rimming and anal fingering in the past three months were endorsed by 62% and 57%, respectively. Approximately one-third (31%) of men reported sex with an anonymous partner in the past three months, and slightly fewer (25%) reported participation in group sex in the same time period (Tables 2, 3).

Associations Between Recent Sexual Behaviors and HIV Status, Adjusted for Age, Race, and Relationship Status

Men who endorsed fisting in the past three months were almost five times as likely to be HIV-positive as those who did not report recent fisting (aPR: 4.75, 95% CI: 3.00–7.51). Felching (aPR: 4.22, 95% CI: 2.57–6.91) and enema use (aPR: 3.65, 95% CI: 2.03–6.58) were each independently associated with an approximate four-fold increase in HIV prevalence. Recent participation in group sex (aPR: 1.92, 95% CI: 1.12–3.28) was also significantly more common among HIV-positive men (Tables 2, 3). These relationships did not meaningfully change when biological HIV status was used in place of known HIV status (data not shown).

Associations Between Recent Sexual Behaviors and STI Status, Adjusted for Age, Race, and Relationship Status

STI prevalence (chlamydia, gonorrhea, or primary/secondary syphilis) was significantly higher among those who reported recent use of sex slings (aPR: 2.35, 95% CI: 1.59–3.48), fisting (aPR: 1.78, 95% CI: 1.03–3.08), or use of insertive sex toys (aPR: 1.46, 95% CI: 1.03–2.06). Anonymous sex and group sex in the past three months were significantly

associated with prevalent STI, with respective aPRs of 1.51 (95% CI: 1.07–2.15) and 1.86 (95% CI: 1.34–2.60) (Tables 2, 3).

Adjusted Associations Between Recent Sexual Behaviors and STI, Stratified by HIV Status

UAI was associated with increased STI prevalence among HIV-negative MSM (aPR: 1.88, 95% CI: 1.09–3.24), but not among HIV-positive MSM (aPR: 0.84, 95% CI: 0.45–1.54, interaction p-value: 0.03). Felching was associated with a nearly 3-fold increase in STI prevalence among HIV-negative men (aPR: 2.80, 95% CI: 1.97–3.96), but not among HIV-positive men (aPR: 1.37, 95% CI: 0.71–2.66, interaction p-value: 0.04). Oral sex was not associated with STI among HIV-negative men (aPR: 1.65, 95% CI: 0.45–5.99), but was associated with *decreased* STI prevalence among HIV-positive men (aPR: 0.34, 95% CI: 0.17–0.69, interaction p-value: 0.08) (Figure 1).

CONCLUSIONS

To our knowledge, this study provides the first comprehensive quantification of the prevalence of a wide range of sexual behaviors practiced in a clinical sample of MSM, as well as associations between these behaviors and HIV and STI prevalence. A variety of sexual practices were endorsed by our sample. Many behaviors were significantly associated with prevalent STI and HIV in unadjusted and adjusted analyses.

The common perception that “normal” sex for MSM is AI³² may not be accurate³³ or complete, given the reporting of behaviors other than AI by a substantial proportion of men in this study. Some of our findings are congruent with the few past studies on sexual behavior conducted among US MSM. For example, enema use in the past three months was reported by 35% of a large sample (N=4992) of MSM recruited from websites targeting gay men²⁸, while 30% of our sample endorsed this practice. However, some of our findings differed from previously published results. Only 4% of our participants reported fisting in the past three months, compared to 15% of men attending a sex resort²⁶. This difference is likely due to differing study populations: we enrolled men seeking care at a sexual health clinic, whereas sex resorts have been previously linked to high-risk sexual behaviors.³⁵

Our study is one of the first investigations to quantify associations between many of these specific sexual behaviors and biologically-confirmed STI and HIV. Enema use among MSM, which may damage the anal epithelium³⁶ has been previously linked to elevated HIV and STI prevalence^{28,37}, and our results agree with those studies. Fisting, which has been associated with rectal trauma³⁸ and risk of HIV/STI^{14,39}, was significantly associated with both prevalent HIV and prevalent STI in our analysis. Felching has recently been identified as a common behavior among MSM²⁵, but its associations with STI and HIV have not been investigated. In our study, felching was significantly associated with increased prevalence of HIV and STI.

Notably, although STI and HIV were common in this sample (35% and 17% prevalence, respectively), recent UAI was not significantly associated with prevalent HIV or STI in unadjusted or adjusted analyses. The absence of a significant relationship between UAI and disease may be due to inaccurate self-report, a form of misclassification bias. Men may not

report UAI accurately given extensive public health efforts to reduce its occurrence. Our null findings related to UAI may also reflect our lack of sexual network data. For example, if UAI occurs between two men who are not infected with HIV or STI, then there is no transmission risk attached to the behavior. Also, our analysis did not address sexual position, although risk of disease acquisition is substantially higher for receptive partners during UAI.⁴⁰ Regardless of the reasons, our null findings for UAI confirm that in this sample, using UAI as a singular measure of risky sex is incomplete.

Of the sixteen behaviors assessed in this analysis, relationships between six practices and STI varied significantly by men's HIV status. Point estimates for the associations between behaviors and STI prevalence were stronger (higher) among HIV-negative men than HIV-positive men across all six behaviors. This may reflect differences in behavioral practices and sexual networks between HIV-positive and HIV-negative MSM. Our data indicate that many HIV-positive men have prevalent STIs and are engaging in multiple sexual behaviors. They may also engage in practices perceived to lower disease transmission risk, such as withdrawal before ejaculation^{41–43} or use of lubricants⁴⁴. These findings may also be due to inaccurate self-report. Men who are HIV-positive may be less likely to endorse potentially risky behaviors because of societal expectations to take measures to prevent HIV transmission.

Our project has important limitations. First, all independent variables in these analyses were self-reported. The validity of self-report of sensitive behaviors may be affected by recall or social-desirability bias.^{45–46} To minimize these biases, men self-administered the survey via tablet computer. Second, men had to report anal sex (receptive or insertive) with another man within the past year to be eligible for participation. This criterion limits the generalizability of our findings, because MSM who did not engage in anal sex in the past year were not included. We cannot comment on the prevalence of these behaviors or their association with HIV/STI among men who practice these behaviors *exclusively*. Expanding our sample to include men who did not report anal sex would have likely resulted in increased reports of some sexual practices. Further, we did not address sexual position in this analysis. However, approximately 40% of MSM are versatile in their preferences for sexual positioning⁴⁶, and they act as both insertive and receptive partner during AI. This preference may extend to other insertive behaviors as well. Finally, because this was a cross-sectional study, we cannot determine a causal relationship between these behaviors and disease status. For example, the significant relationship between fisting and HIV may be because fisting increases HIV risk or because HIV-positive men are more likely to engage in fisting.

This analysis is strengthened by use of biologically-confirmed STI as the outcome. The methodologic advantages of using biological instead of self-reported behavioral outcomes are well-documented.⁴⁸ Our analysis is additionally strengthened by inclusion of urethral and rectal chlamydial and gonococcal results, along with oropharyngeal gonorrhea. CDC's STD surveillance program has noted as a limitation of STI research among MSM that many studies measure urethral infections only⁴⁹, whereas up to 53% of chlamydial infections and 64% of gonococcal infections in MSM occur at nonurethral sites.⁵⁰ These infections are missed and STI outcomes are misclassified when testing is limited to urethral screening.

Our assessment of sexual behaviors among MSM has led to numerous lines of inquiry for future research. Very few prior studies have investigated associations between most of these behaviors and HIV/STI, and our findings suggest that many practices are associated with increased HIV or STI prevalence. Further analyses should evaluate whether these associations remain after adjustment for additional confounding variables, such as drug use or number of sexual partners. Additional research is also needed to understand the context of and intent behind these behaviors, including whether seroadaptation or specific environments are meaningful motivators for choosing particular sexual behaviors over others. Future research should also explore the environments in which these behaviors occur and how that might impact STI/HIV risk. MSM may meet sex partners at a variety of venues, including bathhouses, sex resorts, bars, and sex parties, which could impact negotiation of and participation in risky behaviors.⁵¹ Finally, many of these behaviors likely occur together, and the cumulative effect of these exposures on HIV and STI risk is unknown. While the independent risk associated with individual behaviors is important, the risk associated with behaviors performed in combination will likely best capture the true risk that men are facing as a result of multifaceted sexual experiences.

Accurate measurement of sexual risk among MSM is an important component of HIV/STI research⁵². Identification of additional sexual behaviors or behavior profiles that better quantify risk would enable researchers to avoid the bias resulting from misclassifying participants' risk status, allow prevention scientists to identify new targets for intervention, and improve clinicians' ability to identify men most at risk of HIV/STI infection.

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Figure 1. Adjusted associations between recent sexual behaviors and prevalent STI, by HIV status (N=194 HIV-negative, 41 HIV-positive)

Table 1

Sample Characteristics (N=235)

	n	%
Age		
18–24	100	43%
25–34	72	31%
35–44	32	14%
45–54	23	10%
55+	8	3%
Race/Ethnicity		
White	134	57%
Black	54	23%
Hispanic	16	7%
Other Minority ^a	31	13%
Education		
HS Diploma or less	69	29%
At least some college	166	71%
Employment		
Currently Employed	172	73%
Unemployed	58	25%
Missing	5	2%
Relationship Status		
Committed Partner	91	39%
No committed partner	143	61%
Missing	1	0%
Sexual Orientation		
Gay	179	76%
Bisexual	32	14%
Other	23	10%
Missing	1	0%
Lifetime Number of Male Sexual Partners		
Median	23	
IQR	11, 75	
Range	1, 15000	
Missing	8	
Number of Male Sexual Partners in Last 12 Months		
Median	4	
IQR	2, 8	
Range	0, 100	

	n	%
Missing	0	
Prevalent STI ^b		
Positive	82	35%
Negative	151	64%
Missing	2	1%
Known HIV Status		
Positive	41	17%
Negative	194	83%

^a Other minority category includes Asian, Pacific Islander, Native American, Native Hawaiian, other races, and any combination of races

^b Sexually transmitted infection includes gonorrhea, chlamydia, primary/secondary syphilis

Table 2

Prevalence and Associations ^b with Disease Status; Insertive/Receptive Sexual Behaviors among MSM (N=235)

Behavior	Lifetime Prevalence n (%)	Recent ^a Prevalence n (%)	Association with HIV ^b	Adjusted ^d Association with HIV	Association with STI ^{b,e}	Adjusted ^d Association with STI
(Definition)			PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Unprotected anal sex	212 (90)	158 (67)	1.47 (0.76, 2.84)	1.56 (0.81, 3.00)	1.53 (1.00, 2.36)	1.51 (0.98, 2.34)
(Penile-anal intercourse without a condom)						
Oral sex	233 (99)	220 (94)	0.75 (0.26, 2.10)	0.77 (0.26, 2.27)	0.92 (0.45, 1.87)	0.88 (0.43, 1.83)
(Penile-oral intercourse)						
Anal fingering	196 (83)	135 (57)	1.03 (0.59, 1.82)	1.03 (0.57, 1.84)	1.27 (0.88, 1.83)	1.25 (0.86, 1.81)
(using a finger to provide stimulation to the anus)						
Insertive Sex Toys	152 (65)	79 (34)	1.39 (0.79, 2.43)	1.35 (0.76, 2.40)	1.44 (1.02, 2.03)	1.46 (1.03, 2.06)
(use of sex toys that are inserted in to the body, e.g. dildo)						
Fisting	34 (14)	10 (4)	4.81 (2.87, 8.07)	4.75 (3.00, 7.51)	1.74 (1.02, 2.99)	1.78 (1.03, 3.08)
(inserting fist in to rectum)						
Sounding/Catheter	20 (9)	3 (1)	No Estimate ^c	No Estimate ^c	0.94 (0.19, 4.69)	0.89 (0.19, 4.15)
(inserting "sound" or catheter in to urethra)						
Enema	116 (49)	70 (30)	4.04 (2.28, 7.14)	3.65 (2.03, 6.58)	1.40 (0.99, 1.98)	1.50 (1.05, 2.13)
(injecting liquid or gas into the rectum, typically to expel its contents)						

^aRecent = past three months^bAssociations between recent prevalence and disease status^cNo Estimate due to zero cell^dAdjusted for age, race, relationship status^eSexually transmitted infection includes gonorrhea, chlamydia, primary/secondary syphilis**Bold:** The association is statistically significant.

Table 3Prevalence and Associations ^b with Disease Status; Non-insertive Sexual Behaviors among MSM (N=235)

Behavior	Lifetime Prevalence	Recent ^a Prevalence	Association with HIV ^b	Adjusted ^d Association with HIV	Association with STI ^{b,e}	Adjusted ^d Association with STI
(Definition)	n (%)	n (%)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Anonymous Sex	136 (58)	73 (31)	1.54 (0.88, 2.69)	1.37 (0.79, 2.38)	1.43 (1.02, 2.02)	1.51 (1.07, 2.15)
(sex with a partner whose name you did not know)						
Group Sex	160 (68)	58 (25)	1.92 (1.10, 3.34)	1.92 (1.12, 3.28)	1.81 (1.30, 2.53)	1.86 (1.34, 2.60)
(sex with more than one individual at the same time)						
Erotic Asphyxiation	27 (11)	14 (6)	No Estimate ^c	No Estimate ^c	1.45 (0.83, 2.52)	1.38 (0.79, 2.42)
(restriction of oxygen for purpose of sexual arousal)						
Watersports	60 (26)	18 (8)	2.06 (1.00, 4.23)	1.60 (0.74, 3.46)	1.29 (0.74, 2.22)	1.4 (0.79, 2.47)
(use of urine during sexual acts)						
Scatologia	4 (2)	1 (0)	No Estimate ^c	No Estimate ^c	2.85 (2.39, 3.40)	2.41 (1.73, 3.49)
(use of feces during sexual acts)						
Snowballing	67 (29)	28 (12)	1.51 (0.74, 3.08)	1.75 (0.82, 3.72)	1.50 (0.99, 2.28)	1.49 (0.97, 2.30)
(oral exchange of semen between partners)						
Sex sling	62 (26)	18 (8)	2.47 (1.28, 4.76)	1.94 (0.99, 3.81)	2.04 (1.40, 2.98)	2.35 (1.59, 3.48)
(sexual acts involving a harness that suspends one partner)						
Felching	23 (10)	8 (3)	3.92 (2.12, 7.25)	4.22 (2.57, 6.91)	2.21 (1.42, 3.43)	2.22 (1.45, 3.39)
(using mouth to suck semen from partner's rectum)						
Rimming 200 (85)	146 (62)	1.37 (0.74, 2.56)	1.35 (0.72, 2.53)	1.67 (1.10, 2.55)	1.69 (1.10, 2.57)	
(using tongue to provide stimulation to anus)						

^aRecent = past three months^bAssociations between recent prevalence and disease status^cNo Estimate due to zero cell

Bold: The association is statistically significant.

^e Sexually transmitted infection includes gonorrhea, chlamydia, primary/secondary syphilis

^p Adjusted for age, race, relationship status