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Female users of internet-based screening for rectal STIs: descriptive statistics and correlates of positivity

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Abstract

Background—Internet-based screening for vaginal sexually transmitted infections (STI) has been shown to reach high-risk populations. Published studies of internet-based screening for rectal STIs in women are needed. Our objectives were to describe the female users of a rectal internet-based screening intervention and assess what factors correlated with rectal positivity for STIs.

Methods—The website <http://www.iwantthekit.org> offers free STI testing via home self-sampling kits. Women could order vaginal and rectal kits, both containing questionnaires. Rectal and vaginal swabs were tested for *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and *Trichomonas vaginalis* using nucleic acid amplification tests. Data were analysed from 205 rectal kits from January 2009 through February 2011. Self-reported characteristics of participants were examined, and correlates of rectal STI positivity were analysed.

Results—Of the 205 rectal samples returned and eligible for testing, 38 (18.5%) were positive for at least one STI. The women were young (mean age 25.8 years), mostly African–American (50.0%), and only 14.0% always used condoms. After adjusting for age and race, Black race (AOR=3.06) and vaginal STI positivity (AOR=40.6) were significantly correlated with rectal STI positivity. Of women testing positive for rectal STIs who also submitted vaginal swabs, 29.4% were negative in the vaginal sample.

Conclusions—Internet-based rectal screening can reach populations that appear to be at high risk for rectal STIs (18.5% prevalence) and led to the diagnosis of STIs in women who would not

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have been diagnosed vaginally. Black race and vaginal STI positivity were highly correlated with rectal STI positivity.

INTRODUCTION

Unprotected anal sex is fairly prevalent among heterosexuals in the USA. In studies of sexually transmitted diseases (STD) clinic attendees, 10–19% of women report anal sex in the 3-month interval following their visit.¹² In a nationally representative sample, 31% of women aged 15–44 years reported ever having anal sex.³ Only 16% of these women reported using a condom at last anal sex.⁴ Low condom use for heterosexual anal sex has been demonstrated across multiple studies in the USA.⁵⁶

Heterosexual anal sex is an important and largely understudied risk factor for sexually transmitted infections (STI). It has been linked with the transmission of HIV,⁵⁷⁸ the human papillomavirus,⁵ abnormal anal cytology⁹ and anal cancer.¹⁰ Rectal chlamydia and gonorrhoea infections in women have also been linked with heterosexual anal sex,¹¹ although this remains a relatively understudied area.

I Want The Kit (IWTK) is a website that offers free vaginal, penile and rectal testing via self-collection swab kits.¹²¹³ All specimens are tested for *Chlamydia trachomatis*, *Neisseria gonorrhoeae* and *Trichomonas vaginalis*. The rectal testing programme began in January 2009 after earlier data demonstrated that 44% of women ordering vaginal kits reported having had anal sex in the past month.¹⁴ This was a higher prevalence of heterosexual anal sex than had been reported in other studies looking at populations using STI testing services.¹

We investigated whether women would submit self-collected rectal swabs, the characteristics of women using these swabs, and if risk factors for STI positivity could be identified. Our primary hypotheses were that female users of rectal swabs from IWTK would report high-risk sexual behaviour and that a combination of demographic and behavioural risk factors would correlate with STI positivity. Users of IWTK's vaginal kits during this time period have been described in other publications.¹²¹⁵

MATERIALS AND METHODS

Data were collected from January 2009 (when the rectal testing began) to February 2011 (when questionnaires stopped being collected). IWTK was available to men and women in Alaska, Denver, Colorado, Maryland, Philadelphia, Pennsylvania, Washington, DC, West Virginia, and certain Illinois counties. The website was promoted on the radio, on Facebook, in fliers and in some clinics. Kits were ordered predominately online and some were ordered by phone. During this period, 406 rectal kits were ordered by women, of which 208 (51.2%) were returned for testing. Of the 208 returned rectal kits, three were not tested because they lacked completed consent forms, leaving a sample size of 205.

Women ordering rectal kits were prompted to order vaginal testing kits as well; 201 (98.1%) of the women in our sample did so. During this time period, 1091 total vaginal kits were returned for testing. Kits were delivered to, and returned from, participants by US mail.

Women self-collected rectal and vaginal swabs using the swabs enclosed in the kits, filled out the questionnaires in the kits, and completed consent forms and contact sheets. Returned swabs were tested by nucleic acid amplification tests (NAAT, Gen-Probe, San Diego, California, USA), which have been found to have high sensitivity and specificity.¹⁶ Women were contacted with their results by phone, email, text message, or letter. The Johns Hopkins University Institutional Review Board approved the study.

We merged data from the rectal and vaginal questionnaires and paired this information with the results of the tests of the rectal and vaginal swabs. The questionnaires contained a variety of questions on clinical indicators, demographics, and sexual history.

Clinical indicators

Besides rectal STI positivity, clinical indicators included presence of rectal symptoms and reports of prior vaginal STIs. Rectal symptoms were analysed as ‘any rectal symptoms’ and included one or more of the following: rectal discharge, pain or burning in the rectum, pain during rectal intercourse, abdominal pain, or rectal bleeding. Vaginal STI positivity was analysed as any STI positivity, including *C trachomatis*, *N gonorrhoeae* and *T vaginalis*.

Demographic measures

Demographic measures asked of all participants included age, race (White, Black, Asian, American Indian/Alaskan Native, Native Hawaiian/other Pacific Islander, Other), Hispanic ethnicity, health insurance status (insured, uninsured), Medicaid eligibility (yes, no, don’t know), and marital status (single, married, divorced, separated). Income was measured as personal annual income for those over 21 years of age and household income for those less than 21 years. Highest level of education was asked of all participants, but only analysed for those over 24 years due to the different meanings education status has at different ages (eg, a 17-year-old with ‘some high school’ should not be in the same education category as a 30-year-old with ‘some high school’). In the univariate analyses, race was categorised as Caucasian, African–American and other, and Hispanic ethnicity was assessed separately. In the multivariable analyses, race/ethnicity was dichotomised into White non-Hispanic and Black non-Hispanic, and all other race/ethnicities were dropped from the data analysis—as the heterogeneity in STI positivity rates among them caused the investigators to decide that pooling them would be inappropriate. For all multivariate analyses, marital status was dichotomised as currently married or not, income was dichotomised as over or under US \$10 000 per year, and education was dichotomised as greater than high school, or high school or less. The education variable was dichotomised because ORs could not be constructed using the original categories—none of the participants with a bachelor’s degree or above had a rectal STI. All other variables were used as measured.

Sexual history measures

Sexual history measures included age at first anal sex, ever experiencing forced anal sex, anal sex in the last 3 months, anal sex frequency (never, some of the time, most of the time, always), condom use during anal sex (never, some of the time, most of the time, always), drinking before anal sex (no, yes) and to what extent (always, most of the time, some of the time), number of anal sex partners in the previous year (none, 1, 2–4, 5–9, 10–15, 16 or

more), new anal partners in the previous 3 months (no, yes), and whether or not any of one's partners has ever had a sexually transmitted disease (no, yes, don't know).

Statistical analyses

The statistical analyses used data from the tested rectal kits to construct summary statistics, perform initial analysis, and calculate unadjusted and adjusted ORs. We included those measures that we judged a priori to be the most relevant to our investigation of rectal STI positivity. For five measures where 10% or more data was missing, missing indicator variables were constructed to determine whether 'missingness' was statistically significant between positive and negative group. No statistically significant ($p < 0.05$) missingness was found for all measures with 10% or more data missing, and participants with missing data on a given variable were excluded from the analysis of the significance of that variable. AORs were therefore constructed with a smaller sample than the unadjusted ORs due to model-wise deletion; only 152 out of the 205 women had data on all the adjustment variables.

Our initial analysis tested for significant differences between rectally positive and negative women using t tests and χ^2 tests. Unadjusted ORs were constructed through logistic regression. We then performed multiple logistic regressions to attain adjusted ORs (AORs), adjusting for variables that had significant p values (< 0.05) in the initial analysis, and that had been asked of all participants. We adjusted for these variables because they seemed particularly likely to be confounders. Collinearity was assessed using the variance inflation factor (VIF), and goodness of fit was assessed using Hosmer-Lemeshow's goodness-of-fit test. All analyses were performed using STATA, V.11 (Stata Corp LP, College Station, Texas, USA).

RESULTS

Participant characteristics

The summary statistics of the participant characteristics are presented in table 1, along with the initial analysis of between-group differences. The 205 women in our sample were young (mean age 25.8 years) and predominantly African-American (50.0%) and Caucasian (42.4%). Approximately half (46.9%) did not have health insurance. A third (34.3%) of women over 21 years had annual personal incomes less than US \$10 000 and half (48.7%) of women under 21 years had annual household incomes under US\$10 000. Of women aged over 24 years, just over a third (36.8%) had not had any schooling beyond high school, a third (35.8%) reported having attended community college, a vocational college, or 'some college', and just over a quarter (27.4%) had a bachelors or higher degree. The vast majority (91.2%) of women in our sample were single.

The sexual history of our participants put them at high risk of rectal STIs. The mean time since first anal sex was 4.8 years. The majority (57.5%) of participants reported having anal sex in the previous 3 months and 8.2% reported having been forced to have anal sex at some point in their lives. When asked how often they had anal sex, a quarter (22.6%) reported 'never', two-thirds (65.2%) reported 'some of the time', and smaller proportions responded 'most of the time' (9.7%) or 'always' (2.6%). Half (48.7%) of all participants reported never

using condoms for anal sex, with successively smaller proportions using them ‘some of the time’ (22.7%), ‘most of the time’ (14.7%), and ‘always’ (14.0%). Over half (57.9%) reported ever drinking before anal sex, and of those who drank, three-quarters (74.4%) reported drinking ‘some of the time’, 12.2% most of the time, and 13.3% always.

Two-thirds of our sample (64.1%) reported having only one anal partner in the previous year, 15.4% reported having no anal partners in the previous year, 20.5% reported having two to four partners, and no one reported over four anal partners. Most (80.3%) participants had not had a new anal sex partner in the last 3 months. When asked whether or not their partner had ever been diagnosed with an STI, half (48.1%) of participants replied ‘don’t know’, 22.5% ‘yes’, and 18.4% ‘no’.

Of the 205 tested rectal kits, 18.5% (38) were positive for at least one of the three STIs: 12.7% (26) for chlamydia, 2.4% (5) for gonorrhoea, and 6.3% (13) for trichomonas. Of these, two samples were positive for chlamydia and gonorrhoea, two for chlamydia and trichomonas, and one for all three STIs.

The vast majority (201 out of 205) of participants returned vaginal kits along with their rectal kits, and 199 of returned kits (99.0%) contained consent forms and were tested. Of tested vaginal kits, 17.6% (35) were positive for one or more STI: 11.1% (22) for chlamydia, 2.5% (5) for gonorrhoea, and 8.0% (16) for trichomonas. Of these, two were positive for chlamydia and gonorrhoea, four for chlamydia and trichomonas, and one for all three STIs. Of women testing positive for rectal STIs, who also submitted vaginal swabs, 29.4% were not positive in the vaginal sample.

Correlates of rectal STI positivity

In our initial analysis, three variables were significantly different ($p < 0.05$) between the rectal STI positives and negatives: age ($p = 0.01$), race ($p < 0.01$), and vaginal STI positivity ($p < 0.001$).

The results of the logistic regressions are summarised in table 2. The unadjusted ORs show similar results to the initial analysis. Age was statistically significant ($p = 0.015$); women had a 8% lower odds (95% CI 2% to 14%) of rectal STI positivity with each additional year of life. Race was highly significant ($p < 0.01$); Black non-Hispanic women had a 3.53 times greater odds (95% CI 1.4 to 8.8) of rectal STI positivity than did White non-Hispanic women. Women with vaginal STIs had 33.60 times the odds (95% CI 12.9 to 87.6) of having rectal STIs than women who did not ($p < 0.001$).

We then conducted a multivariable analysis for each variable in our univariate logistic analysis, adjusting for age and race. These variables were chosen because they met the a priori criteria described in the Methods Section above. The mean VIF was 1.13, and so, potential collinearity between the adjustment variables was judged not to be of major concern. Hosmer–Lemeshow’s goodness of fit test was performed on each of the multivariable models and was non-significant ($p > 0.05$) in all cases.

After adjusting for the possible confounders of age and race, only two variables remained significantly associated with STI positivity: race (AOR=3.06, 95% CI (1.25 to 7.91), $p=0.024$) and vaginal positivity (AOR=40.60, 95% CI (11.6 to 122.1), $p<0.001$).

DISCUSSION

This study describes the characteristics of women using internet screening for rectal STIs. It indicated that it is feasible to use the internet to screen women for rectal STIs, that a high prevalence of STIs was detected, and that there are women who would have not been diagnosed with STIs had only vaginal internet testing been available. The study also builds on the current literature by analysing correlates of rectal positivity for women who self-selected to be tested via self-administered tests.

Our study had several limitations. Our sample size was fairly small, especially among rectal positives. This small sample size caused us to analyse STI positivity as a single outcome, rather than assessing each STI separately. It was difficult for us to interpret the association between vaginal and rectal positivity, as this could be due to: cross-contamination between the areas; a single partner causing both infections; or similar risk factors contributing to rectal and vaginal STI acquisition. Given the demographic and risk behaviour differences in the populations affected by chlamydia, gonorrhoea and trichomoniasis, treating these STIs as a single variable is not ideal. Non-response was problematic on several variables (up to 15.4%), and although we looked for possible biases caused by this non-response, we cannot determine whether non-response was correlated with some unmeasured variable. Our use of a complete case analysis may have introduced some bias. The answers of some participants were inconsistent and indicated that they might not have fully understood certain questions (eg, a few participants reported never engaging in receptive rectal intercourse but reported anal sex in the last 3 months). Our multivariable analysis did not look at the possible interactions between variables, which may have led to incomplete adjustment for potential confounders and effect modifiers. Finally, generalisability of these findings to the general population may be limited given that our participants were self-selected. All participants presumably judged themselves to be at risk for rectal STIs, and so, variability in risk factors in our sample was likely much lower than that found in the general population.

The strengths of this study are that we were able to assess a relatively novel method of rectal screening, that we had vaginal and rectal positivity data on most participants, and that we had extensive sexual behaviour data about participants.

Our results demonstrated that rectal internet screening can reach a population of women with fairly high rectal STI prevalence (18.5% among users of the service) and high-risk behaviour. Only 14% of women receiving testing reported using condoms all the time for rectal sex. Of the women with rectal STIs, 70.0% reported no symptoms. Of the 38 rectally positive women, four (10.5%) were not tested vaginally, and of the 34 tested vaginally, 10 (29.4%) were not positive for vaginal STIs.

These 14 women, making up 36.8% of the rectally positive women, would not have been diagnosed via internet vaginal testing alone. Other studies have also found anal STIs in

women who were not infected vaginally, with rectal screening increasing detection by 15–100% over vaginal screening alone.^{17–20}

None of the variables most directly causally associated with STI acquisition (condom use, frequency of anal sex, number of anal sex partners) were statistically significant. This may have been due to our limited sample size and the complexity of the interrelation of these variables. However, other studies have also found a lack of significant correlation between anal sex and rectal STIs.¹⁸¹⁹

That race was so significantly associated with rectal STI positivity, despite our small sample size and adjustment for age, speaks to the importance of race in STI acquisition even among a cohort of individuals who are self-selecting for testing. Race might be acting as a proxy of STI prevalence in the community from which sex partners were drawn. The other demographic variables in our study, while not significantly associated with our outcome, trend in a way that may suggest that they too may be acting as proxies for prevalence among partners. The characteristics of having health insurance, non-eligibility for Medicaid, having an annual individual or household income of over US \$10 000, having a greater than high school education, and being married, were all trended toward being protective of rectal positivity, though not significantly so.

Studies of clinic-based rectal STI screening in women have reported similar findings. Low condom use for heterosexual anal sex has been reported in many studies,^{1421–24} and multiple studies have found the majority of women with rectal STIs to be asymptomatic.²⁵²⁶ In one study by Hunte *et al*,²⁶ female STD patients at a Miami clinic were routinely offered rectal chlamydia and gonorrhoea screening if they practiced receptive rectal intercourse. Those patients had a prevalence of 27.8% for any rectal STI, with 17.5% rectal chlamydia infections and 13.4% rectal gonorrhoea infections. Only 12.5% of chlamydia-positive women reported rectal symptoms, and 6% of chlamydia cases and 35% of gonorrhoea cases would have been missed if urine-based screening alone had been offered.²⁶

Although literature examining the correlates of rectal STI positivity among women is fairly scant, other studies have found young age to be associated with rectal STIs among women practicing anal sex. The Hunte *et al*²⁶ study found that age less than 28 years was significantly associated with rectal chlamydia positivity; a comparison of Black versus White race was not presented. Young age was also found to be a risk factor for rectal STIs in high-risk women attending a clinic in Swansea, UK.¹¹ In our study, we found young age to be significantly associated with rectal STI when looked at independently, but not after adjustment for possible confounders.

In summary, our analysis indicated that IWTK tested a group of women with a relatively high prevalence of rectal STIs (18.5%) and that approximately 30% of these women would not have been diagnosed if they had only been tested vaginally. Our analysis also indicated that Black race and vaginal STI positivity were strongly associated with rectal STI positivity.

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References

1. Tian L, Peterman T, Tao G, et al. Heterosexual anal sex activity in the year after a STD clinic visit. *Sex Transm Dis.* 2008; 35:905–9. [PubMed: 18685549]
2. Javanbakht M, Guerry S, Gorbach PM, et al. Prevalence and correlates of heterosexual anal intercourse among clients attending public sexually transmitted disease clinics in Los Angeles County. *Sex Transm Dis.* 2010; 37:369–76. [PubMed: 20514690]
3. Chandra A, Mosher WD, Copen C, et al. Sexual behavior, sexual attraction, and sexual identity in the United States: data from the 2006–2008 National Survey of Family Growth. *Natl Health Stat Report.* 2011; 36:1–36. [PubMed: 21560887]
4. Leichter J, Chandra A, Liddon N, et al. Prevalence and correlates of heterosexual anal and oral sex in adolescents and adults in the United States. *J Infect Dis.* 2007; 195:1852–9. [PubMed: 17492602]
5. Halperin D. Heterosexual anal intercourse: prevalence, cultural factors, and HIV infection and other health risks, part I. *AIDS Patient Care STDs.* 1999; 13:717–30. [PubMed: 10743535]
6. McBride KR, Fortenberry JD. Heterosexual anal sexuality and anal sex behaviors: a review. *J Sex Res.* 2010; 47:123–36. [PubMed: 20358456]
7. Misegades L. Anal intercourse among young low-income women in California: an overlooked risk factor for HIV? *AIDS.* 2001; 15:534–5. [PubMed: 11242155]
8. Voeller B. AIDS and heterosexual anal intercourse. *Arch Sex Behav.* 1991; 20:233–76. [PubMed: 2059146]
9. Holly E, Ralston M, Darraugh T, et al. Prevalence and risk factors for anal squamous intraepithelial lesions in women. *J Natl Cancer Inst.* 2001; 93:843–9. [PubMed: 11390533]
10. Frisch M, Glimmerius B, van den Brule A, et al. Sexually transmitted infection as a cause of anal cancer. *N Engl J Med.* 1997; 337:1350–8. [PubMed: 9358129]
11. Sethupathi M. Rectal *Chlamydia trachomatis* infection in women. Is it overlooked? *Int J STD AIDS.* 2010; 21:93–5. [PubMed: 19917639]
12. Gaydos CA, Hsieh Y-H, et al. *Trichomonas vaginalis* infection in women who submit self-collected vaginal samples after Internet recruitment. *Sex Transm Dis.* 2011; 38:828–32. [PubMed: 21844738]
13. Gaydos CA, Barnes M, Aumakhan B, et al. Can e-technology through the Internet be used as a new tool to address the *Chlamydia trachomatis* epidemic by home sampling and vaginal swabs? *Sex Transm Dis.* 2009; 36:577–80. [PubMed: 19543145]
14. Gaydos CA, Dwyer K, Barnes M, et al. Internet-based screening for *Chlamydia trachomatis* to reach non-clinic populations with mailed self-administered vaginal swabs. *Sex Transm Dis.* 2006; 33:451–7. [PubMed: 16652069]
15. Gaydos CA, Barnes M, Jett-Goheen M, et al. Characteristics and predictors of women who obtain rescreening for sexual transmitted infections using the www.iwantthekit.org screening program. *Int J STD AIDS.* 2013; 24:736–44. [PubMed: 23970594]
16. Cosentino LA, Campbell T, Jett A, et al. Use of nucleic acid amplification testing in diagnosis of anorectal sexually transmitted infections. *J Clin Microbiol.* 2012; 50:2005–8. [PubMed: 22493338]
17. Giannini CM, Kim HK, Mortensen J, et al. Culture of non-genital sites increases the detection of gonorrhea in women. *J Pediatr Adolesc Gynecol.* 2010; 23:246–52. [PubMed: 20434928]
18. Barry PM, Kent CK, Philip S, et al. Results of a program to test women for rectal chlamydia and gonorrhea. *Obstet Gynecol.* 2010; 115:753–9. [PubMed: 20308835]

19. Van Liere GA, Hoebe CJ, Niekamp A-M, et al. Standard symptom- and sexual history-based testing misses anorectal *chlamydia trachomatis* and *neisseria gonorrhoeae* infections in swingers and men who have sex with men. *Sex Transm Dis*. 2013; 40:285–9. [PubMed: 23486492]
20. Javanbakht M, Gorbach P, Stirland A, et al. Prevalence and correlates of rectal chlamydia and gonorrhea among female clients at sexually transmitted disease clinics. *Sex Transm Dis*. 2012; 39:917–22. [PubMed: 23191945]
21. Hensel D, Fortenberry J, Orr D. Factors associated with event level anal sex and condom use during anal sex among adolescent women. *J Adolesc Health*. 2010; 46:232–7. [PubMed: 20159499]
22. Friedman SFP, Kottiri B, Neaigus A, et al. Prevalence and correlates of anal sex with men among young adult women in an inner city minority neighborhood. *AIDS*. 1991; 15:2057–60. [PubMed: 11600841]
23. Lewis D, Watters J, Case P. The prevalence of high-risk sexual behavior in male intravenous drug users with steady female partners. *Am J Public Health*. 1990; 80:465–6. [PubMed: 2316770]
24. Gorbach P, Manhart L, Hess K, et al. Anal intercourse among young heterosexuals in three sexually transmitted disease clinics in the United States. *Sex Transm Dis*. 2009; 36:193–8. [PubMed: 19265740]
25. Raychaudhuri M, Birley HDL. Audit of routine rectal swabs for gonorrhoea culture in women. *Int J STD AIDS*. 2010; 21:143–4. [PubMed: 20090002]
26. Hunte T, Alcaide M, Castro J. Rectal infections with chlamydia and gonorrhoea in women attending a multiethnic sexually transmitted diseases urban clinic. *Int J STD AIDS*. 2010; 21:819–22. [PubMed: 21297090]

Key messages

- I Want The Kit tested a group of women who appeared to be at high risk for rectal sexually transmitted infections (STI), with a rectal STI prevalence of 18.5%.
- 36.8% of the women with rectal STIs would not have been diagnosed via internet vaginal testing if rectal testing had not been available to them.
- Black race and vaginal STI positivity were strongly associated with rectal STI positivity.

Table 1

Summary of participant characteristics by rectal sexually transmitted infection status—internet-based screening cohort of women (n=205)[†]

Risk factor	Characteristic	STI negative % (n=167)	STI positive % (n=38)	Total % (n=205)	p Value
Vaginal positive**	No	93.3	29.4	82.4	<0.001
	Yes	6.7	70.6	17.6	
Any rectal symptoms	No	72.2	70.0	71.8	0.81
	Yes	27.8	20.0	28.2	
Mean age (year)*		26.4	23.1	25.8	0.01
Race**	White	47.8	18.9	42.4	<0.01
	Black	45.3	70.3	50.0	
	Other	6.9	10.8	7.6	
Ethnicity	Hispanic	8.3	2.9	7.3	0.28
	Non-Hispanic	91.7	97.1	92.7	
Race/ethnicity as used in analysis**	White non-Hispanic	51.8	23.3	46.7	<0.01
	Black non-Hispanic	48.2	76.7	53.3	
Health insurance	No	46.8	53.1	47.9	0.51
	Yes	53.2	46.9	52.1	
Eligibility for Medicaid	No	52.9	31.3	49.2	0.08
	Yes	13.6	18.8	14.4	
Personal income if over 21 years (n=157)	Don't know	33.6	50.0	36.4	
	<US\$10 000/year	35.0	29.4	34.3	0.65
Household income if under 21 years (n=62)	>US\$10 000/year	65.0	70.6	65.7	
	<US\$10 000 / year	55.6	33.3	48.7	0.20
Highest level of education if over 24 years (n=101)	>US\$10 000 / year	44.4	66.7	51.3	
	High school or less	32.1	58.3	35.5	0.05
Marital status	Community or some college	35.8	41.7	36.6	
	Bachelors or above	32.1	0.0	28.0	
Mean age at first rectal sex (year)	Single	89.9	97.1	91.2	0.17
	Currently married	10.1	2.86	8.8	
Time since first rectal sex (years)		21.4	19.5	21.0	0.12
		5.1	3.7	4.8	0.23

Risk factor	Characteristic	STI negative % (n=167)	STI positive % (n=38)	Total % (n=205)	p Value
Ever forced rectal sex	No	91.7	92.3	91.8	0.92
	Yes	8.3	7.7	8.2	
Anal sex in last three months	No	43.1	39.4	42.5	0.69
	Yes	56.9	60.6	57.5	
Rectal sex frequency if have	Some of the time	84.5	82.6	84.2	0.95
	Most of the time	12.4	13.0	12.5	
	Always	3.1	4.4	3.3	
Anal partners in previous year	None	16.0	12.0	15.4	0.30
	One	65.7	56.0	64.1	
	Two to four	18.3	32.0	20.5	
New anal partner in last three months	No	79.5	84.0	80.3	0.61
	Yes	20.5	16.0	19.8	
Condoms for rectal sex	Never	48.4	50.0	48.7	0.97
	Some of the time	23.4	19.2	22.7	
	Most of the time	14.5	15.4	14.7	
	Always	13.7	15.4	14.0	
Drink before rectal sex	No	40.5	50.0	42.1	0.37
	Yes	59.5	50.0	57.9	
Partner STD	No	21.1	3.9	18.4	0.11
	Yes	32.6	38.5	22.5	
	Don't know	46.2	57.7	48.1	

* $p < 0.05$, χ^2 test (categorical) or t test (continuous).

** $p < 0.01$, χ^2 test (categorical) or t test (continuous).

† All percentages describe the distribution of answers among those who responded to the question. STI, sexually transmitted infections.

Table 2

Logistic regression analysis by rectal sexually transmitted infection status

	Crude			Adjusted [†]		
	OR	95% CI	p Value	OR	95% CI	p Value
Vaginal positive			<0.001**			<0.001**
No	Ref			Ref		
Yes	33.60	(12.9 to 87.6)		37.62	(11.6 to 122.1)	
Age (year)	0.92	(0.86 to 0.98)	0.02*	0.95	(0.88 to 1.02)	0.17
Race/ethnicity			<0.01**			0.02*
White non-Hispanic	Ref			Ref		
Black non-Hispanic	3.53	(1.4 to 8.8)		3.14	(1.25 to 7.91)	
Health insurance			0.51			0.59
No	Ref			Ref		
Yes	0.78	(0.36 to 1.66)		0.78	(0.32 to 1.91)	
Eligibility for Medicaid			0.09			0.77
No	Ref			Ref		
Don't know	2.52	(1.06 to 5.98)		1.41	(0.53 to 3.73)	
Yes	2.34	(0.76 to 7.18)		1.04	(0.27 to 4.04)	
Personal income if over 21 years			0.65			0.36
<US\$10 000/year	Ref			Ref		
>US\$10 000/year	1.29	(0.43 to 3.90)		1.76	(0.52 to 5.98)	
Household income if under 21 years			0.21			0.12
<US\$10 000/year	Ref			Ref		
>US\$10 000/y	2.50	(0.60 to 10.34)		4.46	(0.67 to 29.8)	
Highest level of education if over 24 years			0.09			0.21
High school or less	Ref			Ref		
More than high school [‡]	0.34	(0.10 to 1.17)		0.43	(0.11 to 1.63)	
Marital status			0.20			0.41
Single	Ref			Ref		
Currently married	0.26	(0.03 to 2.05)		0.41	(0.05 to 3.42)	
Any rectal symptoms			0.81			0.70

	Crude			Adjusted [†]		
	OR	95% CI	p Value	OR	95% CI	p Value
No	Ref			Ref		
Yes	1.11	(0.47 to 2.64)		0.82	(0.31 to 2.20)	
Age at first rectal sex (year)	0.92	(0.82 to 1.02)	0.12	0.97	(0.84 to 1.12)	0.67
Years since first rectal sex	0.94	(0.85 to 1.04)	0.24	1.03	(0.89 to 1.19)	0.67
Ever forced rectal sex			0.92			0.91
No	Ref			Ref		
Yes	0.92	(0.19 to 4.44)		0.90	(0.17 to 4.71)	
Anal sex in last three months			0.69			0.64
No	Ref			Ref		
Yes	1.16	(0.54 to 2.51)		1.24	(0.51 to 2.97)	
Rectal sex frequency if have			0.95			0.85
Some of the time	Ref			Ref		
Most of the time	1.08	(0.28 to 4.20)		1.55	(0.34 to 7.01)	
Always	1.44	(0.14 to 14.60)		1.19	(0.09 to 15.4)	
Anal partners in previous year			0.31			0.11
None	Ref			Ref		
One	1.14	(0.30 to 4.33)		1.30	(0.31 to 5.43)	
Two to four	2.33	(0.55 to 9.95)		3.87	(0.79 to 18.9)	
New anal partner in last three months			0.61			0.73
No	Ref			Ref		
Yes	0.74	(0.23 to 2.34)		1.25	(0.36 to 4.34)	
Condoms for rectal sex			0.97			0.62
Never	Ref			Ref		
Some of the time	0.79	(0.26 to 2.45)		0.59	(0.16 to 2.12)	
Most of the time	1.03	(0.30 to 3.54)		0.85	(0.23 to 3.16)	
Always	1.09	(0.31 to 3.77)		0.37	(0.07 to 1.91)	
Drink before rectal sex			0.37			0.66
No	Ref			Ref		
Yes	0.68	(0.29 to 1.59)		1.30	(0.49 to 4.09)	
Partner STD			0.19			0.20

	Crude			Adjusted [‡]		
	OR	95% CI	p Value	OR	95% CI	p Value
No	Ref			Ref		
Don't know	6.89	(0.87 to 54.7)		6.67	(0.80 to 55.8)	
Yes	6.51	(0.79 to 53.7)		6.60	(0.78 to 56.1)	

* p<0.05, logistic regression.

** p<0.01, logistic regression.

[‡] Adjusted for age and race/ethnicity (Black non-Hispanic vs White non-Hispanic).

[†] The 'Community or some college' and 'Bachelors or above' categories, as presented in table 1, were collapsed into a single category for the logistic regressions because ORs could not be constructed for the 'Bachelors or above' category, in which there were no cases.