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Who gets tested for HIV in a South African urban township? Implications for test and treat and gender-based prevention interventions

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Abstract

Background—With increasing calls for linking HIV-infected individuals to treatment and care via expanded testing, we examined socio-demographic and behavioral characteristics associated with HIV testing among men and women in Soweto, South Africa.

Methods—We conducted a cross-sectional household survey involving 1539 men and 1877 women as part of the community-randomized prevention trial Project ACCEPT/HPTN043 between July 2007-October 2007. Multivariable logistic regression models, stratified by sex, assessed factors associated with HIV testing, and then repeated testing.

Results—Most women (64.8%) and 28.9% of men reported ever having been tested for HIV, among whom 57.9% reported repeated HIV testing. In multivariable analyses, youth and students had a lower odds of HIV testing. Men and women who had conversations about HIV/AIDS with increasing frequency and who had heard about antiretroviral therapy were more likely to report HIV testing, as well as repeated testing. Men who had ≥12 years of education and who were of high socio-economic status; and women who were married, who were of low socio-economic status, and who had children under their care had a higher odds of HIV testing. Women, older individuals, those with higher levels of education, married individuals, and those with children under their care had a higher odds of reporting repeated HIV testing. Uptake of HIV testing was not associated with condom use, having multiple sex partners, and HIV-related stigma.

Conclusions—Given the low uptake of HIV testing among men and youth, further targeted interventions could facilitate a test and treat strategy among urban South Africans.

Keywords

HIV; AIDS; VCT; testing; Africa

INTRODUCTION

There have been increasing calls to expand access to HIV testing and then promptly link those found to be HIV-infected to care and treatment in settings with high HIV prevalence[1, 2]. HIV voluntary counseling and testing (VCT) can be an important strategy for primary prevention and an entry point to care, treatment, and support for those found to be

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HIV-infected[3, 4]. Studies have demonstrated the efficacy of VCT in decreasing risky sexual behaviors in generally health populations[5–7]. However, individuals who report repeated VCT uptake may be more likely to engage in high-risk sexual behaviors[8] and may also have higher rates of HIV acquisition[9, 10], and hence may represent a potential group for targeted prevention interventions[11]. Most studies to date that have provided a clearer understanding of risk behaviors and socio-demographic characteristics associated with HIV testing have been conducted in the developed world among high-risk groups[9, 11, 12]. As VCT becomes an integrated part of a comprehensive HIV prevention and care strategy in resource-limited settings, further regional data assessing individual-level characteristics associated with HIV testing from the general population are warranted[4, 13, 14].

Examining access to HIV testing in South Africa is timely as the government recently launched a national effort to test 15 million individuals for HIV and to start an estimated 0.5 million new HIV-infected individuals on antiretroviral therapy (ART) by 2011[15]. South Africa is home to the largest HIV epidemic in the world, with 5.7 million infected individuals, prevalence among adults aged 15–49 years of nearly 20%[16], and an estimated incidence in young women of 5.5 per 100 woman-years[17]. HIV prevalence among South African youth is among the highest in the world, which is likely driven by a range of sexual behaviors, including low levels of condom use, multiple sex partners, and densely connected sexual networks in which few HIV individuals are aware of their infection[18–23]. In light of increases in population testing and ART initiation in South Africa[24], the current study utilizing a large representative sample of the general population can inform programs aimed at expanded testing and linkage of HIV-infected individuals to care and treatment.

We conducted a household survey in Soweto, South Africa to determine socio-demographic and behavioral characteristics associated with HIV testing among men and women as part of the baseline assessment for the community randomized trial Project ACCEPT/HPTN 043. We also examined differences between individuals who reported first-time HIV testing compared to those who reported repeated testing.

METHODS

Setting and participants

A baseline household survey was conducted in communities in Soweto between July 2007 to October 2007. Soweto, an urban African township in Gauteng Province, is located outside Johannesburg, with a population of approximately 1 million people living in an area of nearly 63 square kilometers[25]. Ten communities, each having a population size ranging from 15,000–20,000, were assessed. Further details about the study design, sampling procedures, including household enumeration and sampling procedures, and methods of this trial can be found elsewhere[26]. Briefly, a multistage sampling strategy was used to enumerate all households in each community. Households were randomly ordered and selected in batches of a pre-specified size, and all households within a batch were visited by interview teams until the target sample sizes were reached and all households in the batch were visited. One eligible household member, who met the residency criteria and was aged 18–32 years, was randomly selected to be interviewed in each household.

All assessments were performed via face-to-face interview, but no individual identifying information was collected, so participants remained anonymous. The study received ethical approval by the University of Witwatersrand.

Measurement instrument

Interviews took place in a private place in the participant's household. The interviews were conducted in the language of the participants' choice, including Sotho, Zulu, Tsonga, and

English. Themes addressed in the baseline survey included issues such as alcohol and substance use; sexual risk behaviors; conversations about HIV/AIDS; HIV testing history and disclosure of HIV status; social norms on HIV testing; HIV/AIDS stigma; and knowledge and uptake of ART. Further information about instrument development and validation can be found elsewhere[27].

HIV testing—The outcome variable of HIV testing was defined as "Have you ever been tested for HIV?" followed by the number of times a person has been tested and the reasons for testing. Responses were coded as never tested, non-voluntary (including pregnancy), tested once, and repeated testing (i.e. two or more occasions). HIV status was assessed by asking a respondent "What were the results of your last HIV test?" Answer choices included HIV-negative, HIV-positive, don't know, and refused to answer. If participants had not been tested, they were asked questions about barriers to testing.

Socio-economic variables—The following socio-economic variables were assessed: age, education, primary occupation, income, marital status, currently has a sex partner, source of medical care, and plans to migrate. Socio-economic status was assessed as "high" if the participant owned a car, "medium" if did not own a car but did own at least two of the following items, namely drinking water in house, refrigerator, or cell phone, and "low" if otherwise.

Behavioral variables—The following behavioral variables were assessed: ever used alcohol, ever used drugs, ever had vaginal sex, and ever had anal sex. Sexual behavior over the past 6 months was assessed by inquiring about sexual frequency (regardless of the number of sex partners) and frequency of condom use. Condom use with spouse and other sex partners, number of sex partners, and forced sex were analyzed only among the subset of participants who reported being sexually active in the last 6 months. Participants were classified as "consistent" condom users if they reported using condoms for 100% of reported sex acts with all sex partners in the last month, and otherwise were classified as "inconsistent". Participants were also asked whether they had experienced physical abuse by a sex partner, had an unwanted sexual experience before the age of 12, and had experienced physical violence before the age of 12.

Participants were asked about talking about HIV/AIDS, social norms around HIV testing, and HIV-associated stigma, and further information about how these items were operationally defined and measured can be found elsewhere[28]. Briefly, conversations about HIV/AIDS were assessed by asking participants if they had talked to anyone about HIV/AIDS in the last 6 months. Next, participants were asked to whom they had talked to in the last 6 months. Responses were coded into three ordinal factors: "never," "some," and "common" conservations about HIV/AIDS. Participants were also asked if they had heard of ART. Social norms around HIV testing were assessed with six questions, each with response choices on a Likert scale[28]. After calculating an overall social norms index, scores were divided into three categories—"unfavorable," "intermediate," and "favorable" based on the underlying distribution. HIV-related stigma was assessed with a 19-item scale, each with responses on a 5-point Likert scale, specifically developed for measuring HIV stigma in developing countries[29]. The overall stigma score was split into three categories: "low," "intermediate," and "high" based on the underlying distribution.

Statistical analyses

The primary outcome was first dichotomized as "HIV testing" and "no HIV testing" as never tested. In order to better elucidate sex-specific characteristics associated with HIV testing (effect modification), we present analyses stratified by participant sex (men vs.

women). We then examined participants who reported "first-time HIV testing" relative to those who reported "repeated HIV testing." Multivariable logistic regression models were used to calculate adjusted odds ratios (AOR) of factors associated with HIV testing. In order to elucidate the impact of more distal socio-demographic factors on more proximate behavioral factors[30, 31], we constructed two multivariable logistic models, in which we first examined socio-demographic factors associated with HIV testing, and then examined behavioral factors after controlling for socio-demographic factors. A stepwise approach was used to identify independent risk factors in which variables whose association reached significance ($p<0.20$) were first examined, and those variables independently associated with HIV testing ($p<0.10$) were retained in the core model. Confounding was assessed based on either a change of >0.10 of the non-log transformed beta coefficient of independent risk factors, or *a priori* confounders indentified from the literature. Colinearity of included variables was examined. All data analyses were conducted using STATA (STATACORP, version 10.0, College Station, TX) software.

RESULTS

HIV testing among South African men and women

Among the 3416 enrolled participants, over half (54.9%) were women. A little under half (48.6%) of the participants reported ever having tested for HIV, with more women (64.8%) reporting past testing than men (28.9%) ($p<0.0001$). Among those who had ever been tested, 57.9% reported repeated HIV testing, which was also more common among women than men (60.9% vs. 49.5%; $p<0.0001$). Within the past 12 months, 16.8% of men and 43.8% of women reported having tested for HIV. Figure 1 presents the distribution of HIV testing by sex, number of times (first vs. repeated testing), and type (voluntary vs. non-voluntary testing). For men and women who reported never having undergone HIV testing (51.4%), the main reasons included: not thinking they were at risk (37.0%), being nervous about getting test results (17.0%), and not thinking of getting tested (14.2%).

Socio-demographic characteristics associated with having tested for HIV by sex

Table 1a and 1b present univariate and multivariable analyses for socio-demographic factors associated with having tested for HIV for men and women, respectively. In multivariable analyses, men who were older (>23 years), who had ≥12 years of education, and who were of moderate and high socio-economic status had a higher odds of having tested for HIV. Men who were students, who were unemployed, who received care from the traditional medical sector, and who did not have a sex partner had a lower odds of having tested for HIV. Women who were older (>23 years), who were married, and who had ≥1 child under their care had a higher odds of having tested for HIV. Women who were students, who were of high socio-economic status, and who did not have a sex partner had a lower odds of having tested for HIV.

Behavioral characteristics associated with having tested for HIV by sex

Tables 2a and 2b present univariate and multivariable analyses of behavioral factors associated with having tested for HIV for men and women, respectively. Men who ever had vaginal sex, ever had anal sex, and who had sex in the last 6 months had a higher odds of having tested for HIV. Women who ever had vaginal sex, who had ≥1 lifetime sex partners, and who had sex in the last 6 months had a higher odds of having tested for HIV. Both men and women who had ever talked about HIV/AIDS, who had conversations about HIV/AIDS with increasing frequency, and who had heard of ART had a higher odds of having tested for HIV. Men and women who had experienced physical violence before the age of 12 had a higher odds of having tested for HIV, and also women who had ever been physically abused by a sex partner. Condom use, number of sex partners in the last 6 months, HIV-related

stigma, and substance use were not significantly associated with having tested for HIV for both men and women.

Multivariable analysis of characteristics associated with first and repeated HIV testing

Tables 3a and 3b present multivariable analyses of socio-demographic and behavioral factors, respectively, associated with first-time and repeated HIV testing compared to those who reported no HIV testing. In general, these associations were stronger for those who reported repeated HIV testing compared to those who reported first-time HIV testing. Women, those who were older, and those who had children under their care had a higher odds of reporting both first-time and repeat HIV testing. Students and those who did not currently have a sex partner had a lower odds of first-time and repeat HIV testing. Those who had undergone repeat HIV testing were more likely to have higher levels of education (≥8 years) and be married. Both first-time and repeat HIV testing were not associated with income nor socio-economic status.

In regards to sexual behavior, those who had undergone both first-time and repeat HIV testing had a higher odds of ever having had vaginal sex, having ≥1 lifetime sex partners, and having a sex partner in the last 6 months compared to those who reported no HIV testing. Both first-time and repeat acceptors of HIV testing were more likely to have ever talked about HIV/AIDS, to have had conversations about HIV/AIDS with increasing frequency, and to have heard of ART. Both first-time and repeat acceptors were more likely to report having been ever physically abused by a sex partner, and repeat acceptors were also more likely to report having experienced physical violence before the age of 12. Both first-time and repeat HIV testing were not associated with substance use nor condom use.

In order to elucidate differences by gender in uptake of repeated HIV testing, we also conducted analyses stratified by participant sex (men vs. women) (See Appendix). In multivariable analyses, though correlates of repeated HIV testing were broadly similar across gender, we noted differences for the following socio-demographic variables, namely education, occupation, socio-economic status, having children under care; and the following behavioral variables, alcohol use, having had vaginal and anal sex, lifetime number of sex partners, and physical abuse.

HIV testing and disclosure history

Among those who had been tested, most (>80%) reported receiving information about the meaning of a positive or negative HIV test result before they underwent HIV testing and over 90% reported getting their last HIV test result. A high proportion (>85%) reported ever disclosing their HIV test results. On their last HIV test, 6.3% of participants reported a positive HIV test result. Men were more likely to report decreased risk behaviors following HIV testing compared to women, including using condoms more often (40.0% vs. 29.3%; $p<0.0001$) and reducing number of sex partners (44.1% vs. 24.9%; $p<0.0001$).

DISCUSSION

The current study conducted among a representative sample of urban South African men and women identified several socio-demographic and behavioral characteristics associated with HIV testing that could assist in the development of future test and treat strategies. It is of great concern that about half of the participants (51%) remained unaware of their HIV status in a hyperendemic setting following expanded public-sector access to HIV care and ART through both the South African government and PEPFAR[32]. Among those who had not been tested, over a third reported not thinking they were at risk for HIV. HIV testing in the urban population of Soweto was not higher than recent national South African survey data in

which about half of the respondents reported past HIV testing[16]. Younger individuals and students, who are at particularly high risk of HIV acquisition, were less likely to report having tested for HIV[16]. HIV infections among youth aged 15–24 years represent more than 40% of all infections globally, and 63% reside in sub-Saharan Africa[33]. Further studies in Africa are needed to examine acceptable youth-specific HIV prevention programs, including school-based interventions and routine testing of youth attending healthcare facilities[34, 35], as well as testing in non-clinical settings[36].

Men and women who had talked about HIV with increasing frequency were more likely to report having tested for HIV, which also held for repeated HIV testing. An earlier analysis from all regional sites of the current study found that the only variable that was significantly and consistently associated with past HIV testing was frequent conversations about HIV[28]. Increased communication about HIV may lead to greater acceptance and uptake of testing; in addition, those who are tested for HIV may be more likely to speak openly about HIV[14]. Further studies are needed to elucidate with whom these conversations occur, the context of these conversations, and the impact on HIV testing. Men and women who had heard of ART were also more likely to report having tested for HIV, as well as repeated HIV testing. This is an interesting finding as the current study was conducted in 2007, which was after the roll-out of the government ART program. HIV testing has since accelerated with the increasing availability of ART[37]. Although there has been great concern about stigma's role in impeding testing in South Africa[38–40], HIV stigma was not associated with having tested for HIV. It is possible that national prevention campaigns, such as loveLife (www.lofeLife.com) for South African youth, may be linked to wider awareness about HIV and consequent HIV testing[14].

Men who were older, employed, and of higher educational and socio-economic status were more likely to report having tested for HIV, which is consistent with earlier data from Zimbabwe and South Africa[14, 41]. Given what is known about risk behavior among young people, it is of concern that young and unmarried men were less likely to get tested[40, 42, 43]. Community-based HIV prevention programs in South Africa have been developed to involve men, such as Sonke Gender Justice Network (www.genderjustice.org.za) and Engender Health (www.engenderhealth.org). Further interventions are needed to target young men who may be left out of current public VCT programs, including routine opt-in or opt-out testing of all individuals and the expansion of community-based, barrier-free VCT [40, 44–46].

In sub-Saharan Africa, it has been estimated that nearly 80% of HIV-infected adults are unaware of their status[47]. This study documents a relatively high level of HIV testing (i.e. close to 50%), which is similar to recent data from Botswana but much higher than rural Zimbabwe[40,41]. Also, among those who had been tested, most (>90%) reported receiving their test result, which is higher than some earlier data from South Africa[14, 38]. However, these data suggest that there is still a great need for scaling-up HIV testing in this hyperendemic urban setting. Women were much more likely to report both first-time and repeat HIV testing compared to men, which is different from Ugandan data[48], but in accordance with recent South African surveys[16]. Prevalence studies from South Africa suggest that younger women are four times more likely to be infected with HIV in comparison to men of the same age[22, 23]. In the current study, women who were married, who had an increasing number of children under their care, and who were of lower socio-economic status had a higher likelihood of HIV testing, which is consistent with previous data[43]. Pregnancy among young South African women is high with close to a third of 15–19 years olds and nearly two-thirds of 20–24 year olds reporting a past pregnancy[23]. For many women in this population, HIV testing was likely offered at the time of pregnancy through routine antenatal testing.

Despite high levels of reported sexual risk behavior in this study population[27], after controlling for socio-demographic characteristics, our results do not indicate that condom use and number of sex partners are associated with HIV testing. Additionally, these data do not suggest that those who reported repeated HIV testing were more likely to report safer sex. For men and repeat testers, the current study suggests that those who were most risk-averse with the least number of sex partners in the last six months were taking up HIV testing, which is in accordance with some African studies[41, 49]. Other data from this region have suggested that individuals who accept repeat VCT may be more likely to engage in high-risk sexual behaviors, despite the potential prevention benefits associated with repeat VCT[8, 11, 13, 50]. Unless the respondent receives a positive test result, VCT may not impact subsequent risk taking[12]. The current baseline analysis included participants who had already undergone HIV testing as an individual-level behavioral intervention, which may not be adequate to address prevalent high-risk behaviors in the community[4]. The prevalence of sexual risk behaviors, measured as inconsistent condom use and multiple sex partners, was higher in this urban population than South African national survey data[16]. In light of the high frequency of sexual risk behaviors, particularly among men, and the lack of an association between HIV testing and sexual risk behaviors, these findings suggest that there is a need for more effective risk reduction counseling as part of HIV testing.

A limitation of this study is we were not able to investigate particular reasons for HIV testing (i.e. separating out whether non-voluntary testing was due to pregnancy vs. requested by a healthcare provider for other diagnostic purposes). Due to the cross-sectional design of the current study, causal or temporal inferences cannot be drawn from the associations. The lack of an association between HIV testing and current sexual risk behaviors may be due to the cross-sectional assessment. Questions regarding substance use and sexual behavior have the potential for misreporting due to recall and social desirability bias, especially in face-to-face interviews. However, surveys were confidential, and no identifiable personal information was collected. This baseline dataset did not involve actual HIV testing, but rather used retrospective self-report. A strength of the current study was a large representative population-based sample with high survey completion rates and very little missing data[27], which allowed for greater generalizability and representativeness of these findings. Earlier studies have often relied on clinic-based populations where HIV testers may represent a self-selecting group. The large sample size allowed for assessing relatively rare exposures.

The current study highlights individual-level characteristics that influence the utilization of HIV testing, and found that a number of population sub-groups could be targeted for VCT uptake, particularly youth, students, and men. To date patterns and predictors of HIV testing use have not been fully characterized in resource-limited settings[4]. As VCT continues to be rapidly scaled-up in South Africa, repeat testers will represent a larger proportion of individuals undergoing VCT, and further research will be needed to examine whether sexual risk behaviors change among repeat testers. Given the continued high prevalence of HIV and plans to expand VCT in South Africa, the current study is timely in emphasizing the need for further targeted efforts to expand HIV testing.

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APPENDIX

Table 4a

Socio-demographic factors associated with repeat HIV testing compared to no HIV testing in Soweto, South Africa stratified by sex (N=2717)

Socio-demographic variables	Men (N=1315)	Women (N=1402)
	Adjusted odds ratio, AOR (95% CI); p-value*	**Adjusted odds ratio, AOR (95% CI); p-value***
Age, years †		
18–23	1.00	1.00
23–28	**2.06 (1.39–3.06); <0.0001**	**1.94 (1.44–2.62); <0.0001**
≥28	**2.41 (1.56–3.70); <0.0001**	**1.69 (1.24–2.32); <0.0001**
Education, years †		
7 or below	1.00	1.00
8–12	1.59 (0.87–2.91); 0.130	1.55 (0.98–2.44); 0.058
≥12	**2.84 (1.39–5.81); 0.004**	1.41 (0.80–2.49); 0.228
Primary occupation †		
Employed	1.00	1.00
Unemployed	**0.55 (0.34–0.88); 0.013**	0.94 (0.70–1.26); 0.693
Student	**0.16 (0.07–0.36); 0.004**	**0.25 (0.16–0.40); <0.0001**
Received income in the last year †		
Yes	1.00	1.00
No	1.31 (0.80–2.16); 0.277	1.08 (0.81–1.44); 0.580
Socioeconomic status (SES)		
Low	1.00	1.00
Moderate	1.51 (0.97–2.35); 0.064	0.85 (0.61–1.19); 0.357
High	**1.88 (1.15–3.08); 0.011**	0.70 (0.47–1.03); 0.077
Marital status †		
Single	1.00	1.00
Married	1.46 (0.86–2.47); 0.150	**1.74 (1.21–2.49); 0.002**
Currently has a sex partner †		
Yes	1.00	1.00
No	0.77 (0.53–1.13); 0.190	**0.40 (0.30–0.54); <0.0001**
Children under care †		
0	1.00	1.00
1	1.21 (0.87–1.70); 0.250	**1.86 (1.41–2.46); <0.0001**
≥2	1.35 (0.84–2.18); 0.208	**2.61 (1.84–3.70); <0.0001**

Socio-demographic variables	Men (N=1315)	Women (N=1402)
	Adjusted odds ratio, AOR (95% CI); p-value*	**Adjusted odds ratio, AOR (95% CI); p-value***
Source of medical care when in need		
Public sector	1.00	1.00
Traditional system	0.36 (0.13–1.04); 0.061	0.57 (0.22–1.47); 0.251
Private/NGO Sector	1.36 (0.95–1.94); 0.084	0.92 (0.70–1.22); 0.592
Plan to migrate in the next 2.5 years ┼	1.00	
Yes	**0.69 (0.50–0.94); 0.021**	1.00
No		0.82 (0.64–1.05); 0.132

┼Variables adjusted in multivariable model of predictors of repeat HIV testing (age, gender, education, occupation, migration, sex partner, children under care, married, received income) 30

*Bolded findings reflect statistically significant results (p<0.05).

Table 4b

Behavioral factors associated with repeat HIV testing compared to no HIV testing in Soweto, South Africa stratified by sex (N=2717)

Behavioral variables	Men (N=1315)	Women (N=1402)
	Adjusted odds ratio, AOR (95% CI); p-value*	**Adjusted odds ratio, AOR (95% CI); p-value***
Ever used alcohol		
Yes	1.00	1.00
No	**0.54 (0.34–0.86); 0.009**	0.95 (0.74–1.21); 0.692
Ever used drugs		
Yes	1.00	1.00
No	0.79 (0.55–1.14); 0.219	0.76 (0.40–1.44); 0.409
Ever had vaginal sex		
No	1.00	1.00
Yes	1.51 (0.70–3.26); 0.282	**5.81 (3.38–10.00); <0.0001**
Ever had anal sex		
No	1.00	1.00
Yes	**1.58 (1.01–2.47); 0.044**	1.07 (0.69–1.65); 0.752
# of lifetime sex partners		
0	1.00	1.00
1	0.62 (0.27–1.41); 0.260	**2.34 (1.53–3.56); <0.0001**
2 or greater	1.04 (0.62–1.75); 0.867	**2.72 (1.85–4.01); <0.0001**
Had sex in the last 6 months		
No	1.00	1.00
Yes	1.36 (0.89–2.09); 0.149	1.31 (0.96–1.78); 0.081

Behavioral variables	Men (N=1315)	Women (N=1402)
	Adjusted odds ratio, AOR (95% CI); p-value*	Adjusted odds ratio, AOR (95% CI); p-value*
Frequency of sex in last 6 months**		
1–2 times month	1.00	1.00
More than twice a month	1.08 (0.66–1.77); 0.746	0.87 (0.59–1.29); 0.517
2–4 times a week	1.33 (0.83–2.13); 0.230	0.96 (0.66–1.40); 0.851
≥4 times a week	1.73 (0.91–3.29); 0.092	0.80 (0.47–1.38); 0.437
# of sex partners in the last 6 months**		
1	1.00	1.00
2	0.62 (0.35–1.10); 0.109	0.42 (0.15–1.18); 0.104
> 2	0.70 (0.37–1.31); 0.268	1.86 (0.42–8.30); 0.411
Condom use in the last 6 months**		
Inconsistent	1.00	1.00
Consistent	1.02 (0.68–1.51); 0.920	1.12 (0.82–1.52); 0.460
Condom use with spouse in the last 1 month**		
Inconsistent	1.00	1.00
Consistent	1.42 (0.41–4.86); 0.574	0.58 (0.28–1.17); 0.131
Condom use with non-spousal partners in the last 1 month**		
Inconsistent	1.00	1.00
Consistent	0.93 (0.56–1.54); 0.783	1.08 (0.72–1.61); 0.699
Forced to have sex in the last 6 months**		
No	1.00	1.00
Yes	1.28 (0.59–2.76); 0.525	1.02 (0.44–2.33); 0.955
Ever physically abused by a sex partner		
No	1.00	1.00
Yes	0.87 (0.39–1.96); 0.752	**1.99 (1.37–2.88); <0.0001**
Unwanted sexual experience before age 12		
No	1.00	1.00
Yes	0.90 (0.38–2.11); 0.810	1.18 (0.69–2.02); 0.540
Experienced physical violence before age 12		
No	1.00	1.00
Yes	1.41 (0.93–2.13); 0.100	**1.67 (1.10–2.54); 0.015**
Talked to anyone about HIV/AIDS in lifetime		
No	1.00	1.00

Behavioral variables	Men (N=1315)	Women (N=1402)
	Adjusted odds ratio, AOR (95% CI); p-value*	**Adjusted odds ratio, AOR (95% CI); p-value***
Yes	**4.19 (2.15–8.18); <0.0001**	**3.13 (2.14–4.58); <0.0001**
Conversations about HIV/AIDS scale		
None	1.00	1.00
Some	**1.69 (1.08–2.65); 0.021**	**1.93 (1.40–2.65); <0.0001**
Common	**2.97 (1.90–4.64); <0.0001**	**2.74 (1.98–3.78); <0.0001**
Stigma scale		
Low	1.00	1.00
Intermediate	0.83 (0.58–1.20); 0.342	0.75 (0.56–1.00); 0.052
High	0.78 (0.51–1.19); 0.254	0.80 (0.57–1.12); 0.209
Social norms scale		
Unfavorable	1.00	1.00
Intermediate	0.77 (0.54–1.08); 0.138	**0.67 (0.51–0.88); 0.004**
Favorable	1.03 (0.60–1.77); 0.907	0.81 (0.51–1.30); 0.396
Heard of antiretroviral treatment		
No	1.00	1.00
Yes	**1.84 (1.26–2.69); 0.001**	**2.34 (1.76–3.12); <0.0001**

†Variables adjusted in multivariable model of predictors of repeat HIV testing (age, gender, education, occupation, migration, sex partner, children under care, married, received income)

**Analyzed only on the subset of participants who reported being sexually active in the last 6 months.

*Bolded findings reflect statistically significant results ($p<0.05$).

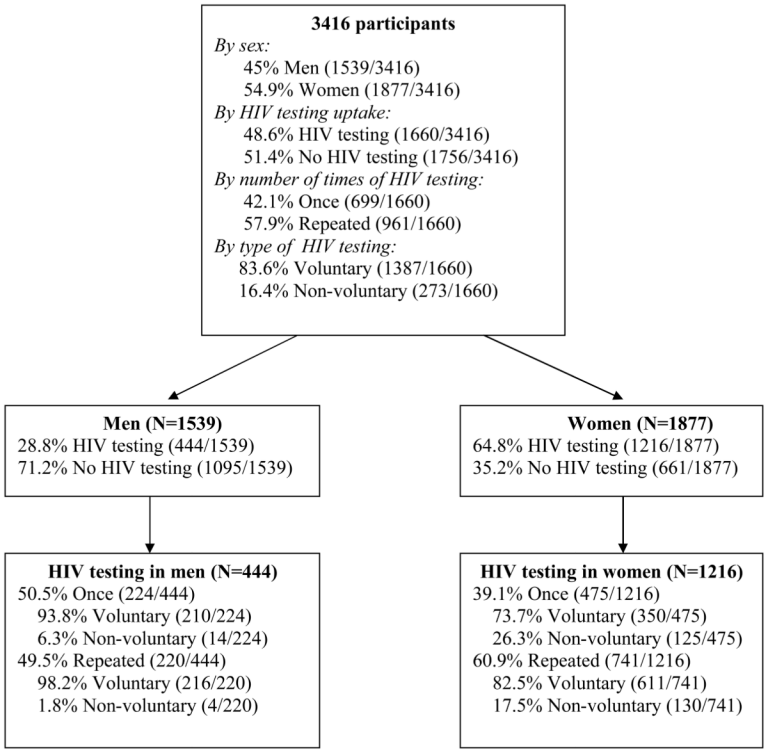

Figure 1.
Distribution of participants

Table 1a

Socio-demographic factors associated with HIV testing among men in Soweto, South Africa (N=1539)

Socio-demographic variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p-value**
	Yes, % (N=444)	No, % (N=1095)		
Age, years*				
18–23	36.8	57.9	1.00	1.00
23–28	31.8	21.5	**2.32 (1.84–2.95); <0.0001**	**2.08 (1.56–2.79); <0.0001**
≥28	31.3	20.6	**2.40 (1.89–3.04); <0.0001**	**1.94 (1.39–2.69); <0.0001**
Education, years				
7 or below	7.5	6.7	1.00	1.00
8–12	82.6	81.4	0.90 (0.62–1.31); 0.591	1.30 (0.82–2.06); 0.249
≥12	10.0	12.0	0.74 (0.47–1.17); 0.199	**2.09 (1.19–3.66); 0.010**
Primary occupation*				
Employed	66.7	46.7	1.00	1.00
Unemployed	23.5	28.9	**0.57 (0.44–0.74); <0.0001**	**0.69 (0.49–0.97); 0.035**
Student	9.7	24.4	**0.28 (0.20–0.40); <0.0001**	**0.43 (0.28–0.66); <0.0001**
Received income in the last year*				
Yes	78.6	66.5	1.00	1.00
No	21.4	33.5	**0.54 (0.42–0.70); <0.0001**	0.95 (0.67–1.34); 0.790
Socioeconomic status (SES)*				
Low	16.0	22.5	1.00	1.00
Moderate	53.2	54.9	**1.36 (1.00–1.84); 0.046**	**1.65 (1.20–2.26); 0.002**
High	30.7	22.5	**1.91 (1.36–2.68); <0.0001**	**2.26 (1.59–3.22); <0.0001**
Marital status*				
Single	81.3	91.7	1.00	1.00
Married	18.8	8.3	**2.54 (1.86–3.47); <0.0001**	1.49 (0.97–2.30); 0.065
Currently has a sex partner				
Yes	77.9	66.1	1.00	1.00
No	22.1	33.9	**0.55 (0.43–0.71); <0.0001**	**0.69 (0.52–0.90); 0.008**
Source of medical care when in need				
Public sector	68.5	71.7	1.00	1.00
Traditional system	2.0	5.0	**0.43 (0.21–0.88); 0.021**	**0.42 (0.20–0.88); 0.023**
Private/NGO Sector	29.5	23.3	**1.32 (1.03–1.70); 0.028**	1.15 (0.87–1.51); 0.309
Plans to migrate in the next 2.5 years				
Yes	39.9	34.8	1.00	1.00

Socio-demographic variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p-value**
	Yes, % (N=444)	No, % (N=1095)		
No	60.1	67.1	**0.74 (0.59–0.93); 0.009**	0.81 (0.64–1.04); 0.105

* Multivariable model adjusted for age, earned income in the last 12 months, primary occupation, socioeconomic status, and marital status

** Bolded findings reflect statistically significant results ($p<0.05$).

Table 1b

Socio-demographic factors associated with HIV testing among women in Soweto, South Africa (N=1877)

Socio-demographic variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value**
	Yes, % (N=1216	No, % (N=661)		
Age, years*				
18–23	31.3	55.0	1.00	1.00
23–28	41.0	27.1	**2.65 (2.04–3.45); <0.0001**	**1.60 (1.23–2.07); <0.0001**
≥28	27.7	17.9	**2.72 (2.03–3.64); <0.0001**	**1.40 (1.07–1.85); 0.013**
Education, years				
7 or below	6.5	8.9	1.00	1.00
8–12	77.0	82.4	1.27 (0.82–1.96); 0.280	1.26 (0.85–1.89); 0.240
≥12	16.4	8.7	**2.57 (1.54–4.30); <0.0001**	1.19 (0.72–1.96); 0.481
Primary occupation*				
Employed	36.1	30.6	1.00	1.00
Unemployed	54.9	41.4	1.12 (0.90–1.40); 0.293	1.08 (0.83–1.41); 0.522
Student	9.0	28.0	**0.27 (0.20–0.36); <0.0001**	**0.36 (0.26–0.52); <0.0001**
Received income in the last year*				
Yes	63.8	58.3	1.00	1.00
No	36.2	41.7	**0.79 (0.65–0.96); 0.020**	0.96 (0.75–1.22); 0.769
Socioeconomic status (SES)*				
Low	18.7	13.2	1.00	1.00
Moderate	58.4	58.7	**0.69 (0.52–0.92); 0.011**	0.77 (0.58–1.03); 0.086
High	22.8	28.1	**0.56 (0.41–0.77); <0.0001**	**0.63 (0.45–0.88); 0.008**
Marital status*				
Single	89.0	95.1	1.00	1.00
Married	11.0	4.9	**2.39 (1.59–3.57); <0.0001**	**1.92 (1.38–2.69); <0.0001**
Currently has a sex partner				
Yes	**83.5**	**62.7**	1.00	1.00
No	**16.5**	**37.3**	**0.33 (0.27–0.42); <0.0001**	**0.45 (0.36–0.58); <0.0001**
Children under care*				
0	21.5	35.0	1.00	1.00
1	54.9	48.9	**1.82 (1.46–2.27); <0.0001**	**1.66 (1.31–2.09); <0.0001**
≥2	23.6	16.1	**2.39 (1.79–3.17); <0.0001**	**2.23 (1.65–3.01); <0.0001**
Source of medical care when in need				
Public sector	74.6	66.8	1.00	1.00

Socio-demographic variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value**
	Yes, % (N=1216	No, % (N=661)		
Traditional system	1.3	2.0	0.60 (0.29–1.26); 0.178	0.69 (0.32–1.50); 0.358
Private/NGO Sector	18.1	31.2	**0.69 (0.56–0.86); 0.001**	0.81 (0.63–1.03); 0.093
Plans to migrate in the next 2.5 years				
Yes	35.1	32.1	1.00	1.00
No	64.9	67.9	1.04 (0.86–1.27); 0.654	**0.77 (0.62–0.96); 0.022**

* Multivariable model adjusted for age, earned income in the last 12 months, primary occupation, socioeconomic status, marital status, and children under care

** Bolded findings reflect statistically significant results ($p<0.05$).

Table 2a

Behavioral factors associated with HIV testing among men in Soweto, South Africa (N=1539)

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=444)	No, % (N=1095)		
Ever used alcohol				
Yes	83.8	79.4	1.00	1.00
No	16.2	20.6	0.75 (0.56–1.00); 0.050	0.78 (0.57–1.06); 0.113
Ever used drugs				
Yes	25.2	23.1	1.00	1.00
No	74.8	76.9	0.89 (0.69–1.15); 0.386	0.83 (0.63–1.09); 0.199
Ever had vaginal sex				
No	5.2	12.9	1.00	1.00
Yes	94.8	87.1	**2.71 (1.72–4.27); <0.0001**	**1.71 (1.05–2.76); 0.028**
Ever had anal sex				
No	86.0	91.3	1.00	1.00
Yes	14.0	8.7	**1.71 (1.21–2.40); 0.002**	**1.48 (1.03–2.12); 0.031**
# of lifetime sex partners				
0	9.2	16.2	1.00	
1	7.7	10.0	1.33 (0.80–2.23); 0.271	1.21 (0.70–2.07); 0.480
2–4	32.0	31.6	**1.77 (1.20–2.62); 0.004**	1.43 (0.94–2.16); 0.087
≥4	51.1	42.2	**2.12 (1.46–3.09); <0.001**	1.46 (0.98–2.18); 0.061
Had sex in the last 6 months				
No	20.2	28.9	1.00	1.00
Yes	80.0	71.1	**1.44 (1.22—1.70); <0.0001**	**1.45 (1.11–1.89); 0.006**
Frequency of sex in the last 6 months**				
1–2 times month	30.7	35.8	1.00	1.00
More than twice a month	29.8	26.7	1.31 (0.93–1.84); 0.117	1.11 (0.77–1.58); 0.559
2–4 times a week	29.5	30.0	1.14 (0.82–1.60); 0.419	0.89 (0.62–1.27); 0.530
≥4 times a week	10.0	7.5	1.55 (0.94–2.55); 0.082	1.15 (0.68–1.94); 0.586
# of sex partners in the last 6 months**				
1	80.0	67.5	1.00	1.00
2	11.4	17.7	**0.56 (0.37–0.83); 0.004**	0.66 (0.44–1.00); 0.055
> 2	8.7	12.8	**0.59 (0.37–0.92); 0.023**	0.68 (0.42–1.09); 0.114
Condom use in the last 6 months**				

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=444)	No, % (N=1095)		
Inconsistent	66.9	71.4	1.00	1.00
Consistent	32.8	28.2	1.24 (0.93–1.65); 0.130	0.92 (0.67–1.26); 0.629
Condom use with spouse in the last 1 month**				
Inconsistent	89.1	95.2	1.00	1.00
Consistent	10.9	4.8	**2.43 (1.33–4.46); 0.004**	1.36 (0.48–3.80); 0.557
Condom use with non-spousal partners in the last 1 month**				
Inconsistent	76.6	71.4	1.00	1.00
Consistent	23.4	28.4	0.76 (0.52–1.09); 0.146	0.70 (0.46–1.04); 0.081
Forced to have sex in the last 6 months**				
No	93.7	95.1	1.00	1.00
Yes	6.3	4.9	1.28 (0.73–2.26); 0.377	1.33 (0.74–2.38); 0.332
Ever physically abused by a sex partner				
No	94.8	96.2	1.00	1.00
Yes	5.2	3.8	1.37 (0.81–2.30); 0.237	1.28 (0.74–2.22); 0.360
Unwanted sexual experience before age 12				
No	95.3	96.2	1.00	1.00
Yes	4.7	3.8	1.25 (0.69–2.18); 0.42	0.78 (0.44–1.38); 0.407
Experienced physical violence before age 12				
No	82.4	86.6	1.00	1.00
Yes	17.6	13.4	**1.38 (1.01–1.88); 0.0346**	**1.43 (1.04–1.97); 0.025**
Talked to anyone about HIV/ AIDS in lifetime				
No	5.6	16.9	1.00	1.00
Yes	94.4	83.1	**3.40 (2.19–5.48); <0.0001**	**3.39 (2.16–5.30); <0.0001**
Conversations about HIV/ AIDS scale				
None	16.4	30.0	1.00	1.00
Some	38.3	43.3	**1.61 (1.18–2.19); 0.002**	**1.69 (1.23–2.33); 0.001**
Common	45.3	26.8	**3.08 (2.25–4.20); <0.0001**	**2.61 (1.89–3.61); <0.0001**
Stigma scale				
Low	28.7	25.9	1.00	1.00
Intermediate	48.9	48.8	0.90 (0.69–1.17); 0.446	1.02 (0.77–1.35); 0.855

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=444)	No, % (N=1095)		
High	22.4	25.3	0.80 (0.58–1.09); 0.151	0.91 (0.65–1.26); 0.576
Social norms scale				
Unfavorable	31.9	27.0	1.00	1.00
Intermediate	58.6	63.4	**0.78 (0.61–1.00); 0.050**	**0.75 (0.58–0.97); 0.030**
Favorable	9.5	9.6	0.84 (0.56–1.26); 0.395	0.80 (0.52–1.24); 0.331
Heard of antiretroviral treatment				
Yes	77.1	64.9	1.00	1.00
No	22.9	35.0	**0.55 (0.43–0.71); <0.0001**	**1.65 (1.27–2.16); <0.0001**

* Multivariable model adjusted for age, earned income in the last 12 months, primary occupation, socioeconomic status, and marital status

** Analyzed only on the subset of participants who reported being sexually active in the last 6 months

*** Bolded findings reflect statistically significant results ($p<0.05$).

Table 2b

Behavioral factors associated with HIV testing among women in Soweto, South Africa (N=1877)

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=1216)	No, % (N=661)		
Ever used alcohol				
Yes	58.4	59.5	1.00	1.00
No	41.6	40.5	**0.75 (0.56–1.00); 0.050**	0.84 (0.68–1.04); 0.119
Ever used drugs				
Yes	3.4	3.6	1.00	1.00
No	96.6	96.4	1.07 (0.64–1.80); 0.769	0.78 (0.45–1.35); 0.391
Ever had vaginal sex				
No	3.8	14.1	1.00	1.00
Yes	96.2	74.0	**8.95 (6.35–12.59); <0.0001**	**5.83 (4.05–8.41); <0.0001**
Ever had anal sex				
No	91.8	93.0	1.00	1.00
Yes	8.2	6.8	1.20 (0.83–1.72); 0.329	1.12 (0.76–1.64); 0.547
# of lifetime sex partners				
0	8.0	28.6	1.00	1.00
1	23.2	22.7	**3.66 (2.67–5.02); <0.0001**	**3.06 (2.19–4.28); <0.0001**
2–4	53.3	37.2	**5.13 (3.85–6.83); <0.0001**	**3.52 (2.59–4.79); <0.0001**
≥4	15.5	11.5	**4.85 (3.37–6.96); <0.0001**	**3.32 (2.26–4.89); <0.0001**
Had sex in the last 6 months				
No	25.3	46.3	1.00	1.00
Yes	74.7	53.7	**2.54 (2.08–3.10); <0.0001**	**1.90 (1.53–2.36); <0.0001**
Frequency of sex in the last 6 months**				
1–2 times month	28.6	32.6	1.00	1.00
More than twice a month	24.6	26.3	1.06 (0.76–1.47); 0.713	0.92 (0.65–1.30); 0.668
2–4 times a week	38.7	30.9	**1.42 (1.05–1.94); 0.023**	1.23 (0.88–1.71); 0.216
≥4 times a week	8.2	10.2	0.90 (0.57–1.43); 0.676	0.83 (0.51–1.35); 0.471
# of sex partners in the last 6 months**				
1	96.3	96.3	1.00	1.00
2	2.1	2.8	0.75 (0.34–1.63); 0.470	0.73 (0.33–1.63); 0.453
> 2	1.6	0.8	1.85 (0.52–6.46); 0.338	1.91 (0.54–6.81); 0.313
Condom use in the last 6 months**				

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=1216)	No, % (N=661)		
Inconsistent	56.1	63.2	1.00	1.00
Consistent	43.9	36.8	**1.34 (1.04–1.73); 0.022**	1.20 (0.91–1.58); 0.192
Condom use with spouse in the last 1 month**				
Inconsistent	84.5	86.6	1.00	1.00
Consistent	15.5	13.4	1.18 (0.79–1.78); 0.409	0.57 (0.30–1.11); 0.102
Condom use with non-spousal partners in the last 1 month**				
Inconsistent	70.9	72.5	1.00	1.00
Consistent	29.1	27.5	1.08 (0.78–1.48); 0.635	1.17 (0.82–1.66); 0.384
Forced to have sex in the last 6 months**				
No	97.2	96.6	1.00	1.00
Yes	2.8	3.4	0.80 (0.40–1.62); 0.553	1.00 (0.47–2.12); 0.987
Ever physically abused by a sex partner				
No	84.9	91.4	1.00	1.00
Yes	15.1	8.6	**1.88 (1.37–2.57); <0.0001**	**1.83 (1.67–3.04); <0.0001**
Unwanted sexual experience before age 12				
No	94.3	95.6	1.00	1.00
Yes	6.0	4.4	1.31 (0.83–2.13); 0.2282	1.24 (0.77–1.99); 0.368
Experienced physical violence before age 12				
No	89.4	92.7	1.00	1.00
Yes	10.6	7.3	**1.52 (1.06–2.19); 0.0175**	**1.53 (1.06–2.21); 0.023**
Talked to anyone about HIV/ AIDS in lifetime				
No	9.5	17.1	1.00	1.00
Yes	90.5	82.9	**1.97 (1.48–2.63); <0.0001**	**2.47 (1.83–3.33); <0.0001**
Conversations about HIV/ AIDS scale				
None	19.4	30.9	1.00	1.00
Some	36.4	38.1	**1.51 (1.19–1.93); 0.001**	**1.59 (1.23–2.07); <0.0001**
Common	44.2	31.0	**2.26 (1.76–2.89); <0.0001**	**2.32 (1.77–3.04); <0.0001**
Stigma scale				
Low	26.7	24.4	1.00	1.00
Intermediate	48.8	52.6	0.85 (0.67–1.07); 0.157	0.80 (0.63–1.03); 0.093

Behavioral variables	Proportion reporting HIV testing		Unadjusted odds ratio, OR (95% CI); p-value	Adjusted odds ratio, AOR (95% CI); p- value***
	Yes, % (N=1216)	No, % (N=661)		
High	24.6	23.0	0.98 (0.74–1.28); 0.868	0.96 (0.72–1.29); 0.827
Social norms scale				
Unfavorable	32.6	27.3	1.00	1.00
Intermediate	58.8	65.0	**0.76 (0.61–0.94); 0.011**	**0.71 (0.57–0.89); 0.004**
Favorable	8.6	7.7	0.93 (0.64–1.36); 0.704	0.95 (0.63–1.43); 0.840
Heard of antiretroviral treatment				
No	20.9	29.8	1.00	1.00
Yes	79.1	70.1	**1.61 (1.30–2.01); <0.0001**	**1.80 (1.43–2.28); <0.0001**

* Multivariable model adjusted for age, earned income in the last 12 months, primary occupation, socioeconomic status, marital status, and children under care.

** Analyzed only on the subset of participants who reported being sexually active in the last 6 months

*** Bolded findings reflect statistically significant results ($p<0.05$).

Table 3a

Socio-demographic factors associated with first-time and repeat HIV testing compared to no HIV testing among men and women in Soweto, South Africa (N=3416)

	Proportion reporting HIV testing, %			Adjusted odds ratio, AOR (95% CI); p-value*	Adjusted odds ratio, AOR (95% CI); p-value*
Socio-demographic variables	**No HIV testing (N=1756)**	**First- time HIV testing (N=699)**	**Repeat HIV testing (N=961)**	**First-time HIV testing vs. no HIV testing**	**Repeat HIV testing vs. no HIV testing**
Gender †‡					
Male	37.6	32.0	22.9	1.00	1.00
Female	62.4	68.0	77.1	**3.45 (2.83–4.22); <0.0001**	**5.32 (4.35–6.52); <0.0001**
Age, years †‡					
18–23	56.1	44.8	28.5	1.00	1.00
23–28	25.0	31.3	36.4	**1.41 (1.11–1.79); 0.004**	**2.02 (1.60–2.55); <0.0001**
≥28	18.9	23.9	35.1	1.19 (0.92–1.54); 0.180	**2.00 (1.55–2.57); <0.0001**
Education, years ‡					
7 or below	8.0	8.0	6.7	1.00	1.00
8–12	82.0	80.5	81.5	1.11 (0.78–1.58); 0.551	**1.53 (1.07–2.19); 0.017**
≥12	9.9	11.4	11.9	1.33 (0.84–2.09); 0.212	**1.79 (1.15–2.79); 0.010**
Primary occupation †‡					
Employed	40.6	39.7	47.6	1.00	1.00
Unemployed	33.6	46.3	46.7	1.05 (0.84–1.31); 0.625	0.83 (0.65–1.06); 0.147
Student	25.8	13.9	5.7	**0.58 (0.43–0.79); <0.0001**	**0.23 (0.16–0.34); <0.0001**
Received income in the last year ‡					
Yes	63.4	66.0	68.9	1.00	1.00
No	36.6	34.0	31.1	0.90 (0.71–1.14); 0.390	1.10 (0.86–1.40); 0.417
Socioeconomic status (SES)					
Low	20.0	18.8	17.5	1.00	1.00
Moderate	56.4	55.7	58.0	0.98 (0.76–1.26); 0.905	1.06 (0.82–1.37); 0.625

	Proportion reporting HIV testing, %			Adjusted odds ratio, AOR (95% CI); p-value*	Adjusted odds ratio, AOR (95% CI); p-value*
Socio-demographic variables	**No HIV testing (N=1756)**	**First- time HIV testing (N=699)**	**Repeat HIV testing (N=961)**	**First-time HIV testing vs. no HIV testing**	**Repeat HIV testing vs. no HIV testing**
High	24.6	25.5	24.5	1.14 (0.85–1.54); 0.370	1.00 (0.74–1.35); 0.959
Marital status ┼					
Single	93.8	89.1	79.1	1.00	1.00
Married	6.2	10.9	20.9	1.14 (0.81–1.60); 0.441	**1.66 (1.24–2.23); 0.001**
Currently has a sex partner † ┼					
Yes	64.8	78.8	84.3	1.00	1.00
No	35.2	21.2	15.7	**0.54 (0.43–0.68); <0.0001**	**0.49 (0.39–0.62); <0.0001**
Children under care † ┼					
0	44.1	33.0	25.9	1.00	1.00
1	41.9	48.2	51.8	**1.23 (1.00–1.53); 0.044**	**1.54 (1.25–1.91); <0.0001**
≥2	14.0	18.7	22.3	**1.43 (1.08–1.89); 0.011**	**2.05 (1.56–2.70); <0.0001**
Source of medical care when in need †					
Public sector	69.9	75.9	70.8	1.00	1.00
Traditional system	3.8	1.9	1.3	0.54 (0.29–1.02); 0.061	**0.45 (0.23–0.90); 0.023**
Private/NGO Sector	26.3	22.3	27.9	**0.76 (0.61–0.96); 0.022**	1.05 (0.85–1.31); 0.604
Plan to migrate in the next 2.5 years † ┼					
Yes	32.6	36.1	36.6	1.00	1.00
No	67.4	63.9	63.4	**0.81 (0.67–0.99); 0.046**	**0.76 (0.62–0.92); 0.007**

† Variables adjusted in multivariable model of predictors of first-time HIV testing (age, gender, occupation, migration, sex partner, children under care, source of medical care)

┼ Variables adjusted in multivariable model of predictors of repeat HIV testing (age, gender, education, occupation, migration, sex partner, children under care, married, received income)

* Bolded findings reflect statistically significant results (p<0.05).

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Table 3b

Behavioral factors associated with first-time and repeat HIV testing compared to no HIV testing among men and women in Soweto, South Africa (N=3416)

	Proportion reporting HIV testing, %			Adjusted odds ratio, AOR (95% CI); p- value*†	Adjusted odds ratio, AOR (95% CI); p- value*┼
Behavioral variables	**No HIV testing (N=1756)**	**First- time HIV testing (N=699)**	**Repeat HIV testing (N=961)**	**First-time HIV testing vs. no HIV testing**	**Repeat HIV testing vs. no HIV testing**
Ever used alcohol					
Yes	71.9	67.2	63.7	1.00	1.00
No	28.1	32.8	36.3	0.91 (0.74–1.13); 0.423	0.86 (0.70–1.05); 0.158
Ever used drugs					
Yes	15.8	10.4	8.3	1.00	1.00
No	84.2	89.6	91.7	0.87 (0.64–1.18); 0.391	0.81 (0.59–1.11); 0.207
Ever had vaginal sex					
No	17.8	5.9	2.9	1.00	1.00
Yes	82.2	94.1	97.1	**2.86 (1.95–4.19); <0.0001**	**4.03 (2.57–6.30); <0.0001**
Ever had anal sex					
No	92.0	91.1	89.6	1.00	1.00
Yes	8.0	8.9	10.4	1.16 (0.83–1.62); 0.368	1.29 (0.94–1.77); 0.108
# of lifetime sex partners					
0	20.8	8.9	7.9	1.00	1.00
1	14.8	20.5	18.0	**2.30 (1.60–3.31); <0.0001**	**1.73 (1.20–2.49); 0.003**
2 or greater	64.3	70.7	74.1	**2.18 (1.56–3.03); <0.0001**	**2.02 (1.47–2.78); <0.0001**
Had sex in the last 6 months					
No	41.6	27.3	23.5	1.00	1.00
Yes	58.4	72.7	76.5	**1.45 (1.13–1.87); 0.003**	**1.33 (1.04–1.71); 0.022**
Frequency of sex in the last 6 months**					
1–2 times month	34.8	31.8	27.4	1.00	1.00

	Proportion reporting HIV testing, %			Adjusted odds ratio, AOR (95% CI); p- value*†	Adjusted odds ratio, AOR (95% CI); p- value*┼
Behavioral variables	**No HIV testing (N=1756)**	**First- time HIV testing (N=699)**	**Repeat HIV testing (N=961)**	**First-time HIV testing vs. no HIV testing**	**Repeat HIV testing vs. no HIV testing**
More than twice a month	26.5	26.7	25.5	1.00 (0.74–1.35); 0.990	0.97 (0.72–1.31); 0.875
2–4 times a week	30.3	34.6	37.3	1.01 (0.75–1.35); 0.920	1.09 (0.82–1.40); 0.525
≥4 times a week	8.4	6.9	9.8	0.72 (0.45–1.15); 0.178	1.08 (0.71–1.64); 0.700
# of sex partners in the last 6 months**					
1	78.8	88.9	93.9	1.00	1.00
2	12.5	6.5	3.3	0.76 (0.50–1.17); 0.228	**0.56 (0.34–0.92); 0.024**
> 2	8.6	4.6	2.8	0.81 (0.49–1.35); 0.436	0.75 (0.43–1.29); 0.308
Condom use in the last 6 months**					
Inconsistent	68.8	60.9	57.4	1.00	1.00
Consistent	31.2	39.1	41.8	1.16 (0.90–1.48); 0.235	1.09 (0.86–1.39); 0.437
Condom use with spouse in the last 1 month**					
Inconsistent	92.0	90.4	82.4	1.00	1.00
Consistent	8.0	9.6	17.6	0.85 (0.52–1.37); 0.510	0.73 (0.40–1.33); 0.317
Condom use with non- spousal partners in the last 1 month**					
Inconsistent	71.8	71.8	72.7	1.00	1.00
Consistent	28.2	28.2	27.3	0.86 (0.63–1.16); 0.336	1.02 (0.75–1.39); 0.883
Forced to have sex in the last 6 months**					
No	95.6	96.3	96.3	1.00	1.00
Yes	4.4	3.7	3.7	1.10 (0.61–1.96); 0.744	1.08 (0.61–1.91); 0.779
Ever physically abused by a sex partner					
No	94.4	89.1	86.4	1.00	1.00
Yes	5.6	10.9	13.6	**1.47 (1.05–2.06); 0.023**	**1.75 (1.27–2.42); 0.001**
Unwanted sexual experience before age 12					

	Proportion reporting HIV testing, %			Adjusted odds ratio, AOR (95% CI); p- value*†	Adjusted odds ratio, AOR (95% CI); p- value*┼
Behavioral variables	**No HIV testing (N=1756)**	**First- time HIV testing (N=699)**	**Repeat HIV testing (N=961)**	**First-time HIV testing vs. no HIV testing**	**Repeat HIV testing vs. no HIV testing**
No	96.0	94.6	94.6	1.00	1.00
Yes	4.0	5.4	5.4	1.41 (0.91–2.17); 0.116	1.11 (0.72–1.73); 0.617
Experienced physical violence before age 12					
No	88.9	88.4	86.9	1.00	1.00
Yes	11.1	11.6	13.1	1.31 (0.97–1.76); 0.072	**1.57 (1.17–2.09); 0.002**
Talked to anyone about HIV/AIDS in lifetime					
No	17.0	10.6	6.9	1.00	1.00
Yes	83.0	89.3	93.1	**1.91 (1.43–2.55); <0.0001**	**3.22 (2.34–4.43); <0.0001**
Conversations about HIV/AIDS scale					
None	30.2	22.3	15.9	1.00	1.00
Some	41.3	38.9	35.5	**1.39 (1.09–1.77); 0.007**	**1.80 (1.40–2.33); <0.0001**
Common	28.4	38.8	48.6	**1.65 (1.28–2.12); <0.0001**	**2.67 (2.07–3.46); <0.0001**
Stigma scale					
Low	25.3	24.2	29.4	1.00	1.00
Intermediate	50.2	50.1	47.8	1.00 (0.79–1.26); 0.973	**0.78 (0.62–0.98); 0.032**
High	24.5	25.6	22.8	1.07 (0.82–1.40); 0.593	0.80 (0.61–1.04); 0.099
Social norms scale					
Unfavorable	27.1	31.4	33.2	1.00	1.00
Intermediate	64.0	60.0	57.8	**0.79 (0.64–0.98); 0.036**	**0.70 (0.62–0.98); 0.001**
Favorable	8.9	8.6	9.0	0.84 (0.58–1.20); 0.352	0.90 (0.63–1.29); 0.588
Heard of antiretroviral treatment					
No	33.0	26.1	18.0	1.00	1.00
Yes	66.9	73.8	82.0	**1.37 (1.11–1.69); 0.003**	**2.12 (1.69–2.65); <0.0001**

†Variables adjusted in multivariable model of predictors of first-time HIV testing (age, gender, occupation, migration, sex partner, children under care, source of medical care)

┼Variables adjusted in multivariable model of predictors of repeat HIV testing (age, gender, education, occupation, migration, sex partner, children under care, married, received income)

** Analyzed only on the subset of participants who reported being sexually active in the last 6 months.

* Bolded findings reflect statistically significant results ($p<0.05$).