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Predicting HIV testing intention among MSM based on the type of last testing facility: The M^3 study

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Abstract

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By Chris Elmlinger

Men who have Sex with Men in the USA remain at high-risk for acquiring HIV. New strategies for prevention and intervention must continue to be prioritized and researched. The association between location of last HIV testing site (mobile clinic, doctor's office, etc.) and intention to test again for HIV has, to our knowledge, not yet been investigated. The potential for these sites to instill regular testing habits among their patients makes them worthy of study. The relationship between the type of last HIV testing site and future testing intention among MSM in the US has not been well studied. This study assesses the association between type of last HIV testing site and future testing intention among MSM in Atlanta, Detroit, and New York City. Cross-sectional data collected by the Mobile Messaging for MSM (M^3) study during their baseline assessment was analyzed to investigate this association. Analysis was conducted using both univariate and multivariate logistic regression models using only the HIV negative study participants. 781 HIV negative participants met the inclusion criteria for this study. No significant association between type of HIV testing site and future HIV testing intention was found (p's > 0.1 for the different types of testing sites), even after adjusting for other predictors (p's > 0.1). Type of testing site was not found to be significantly associated with future testing intention among MSM from three cities, suggesting that there is little to no difference between types of testing sites in instilling recommended testing habits in patients. This result does not indicate that any particular type of testing site should be prioritized in funding or intervention planning. Additional research should be conducted in order to establish the effect of the type of HIV testing site on HIV testing behaviors among MSM. Continued efforts must be made in order to predict future testing and prevention behaviors among MSM throughout the United States in order to reduce the disproportionate burden of HIV among MSM.

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Introduction

Men who have sex with men (MSM) continue to face the highest burden of HIV in the United States (CDC, 2019), and there remains a relative lack of interventions targeted towards MSM (CDC, 2019). New prevention strategies and evaluations of existing strategies are needed to encourage and support this population to engage in regular practices that will mitigate their risk of acquiring HIV. HIV prevention must address the needs of MSM, especially young MSM, for whom yearly HIV incidence doubled from 2002 to 2014 (CDC, 2019), and especially for young MSM of color, for whom these burdens are most severe (CDC, 2019), (Brookmeyer, 2014), (Jenness, 2016), (Sullivan, 2012), (Zlotorzynska, 2020). Currently, prevention services are under-utilized by MSM, with just over half (56%) reporting being tested in the past 12 months, high proportions (76% of HIV positive and 63% of HIV-negative MSM) reporting recent condom-less, receptive anal intercourse, fairly low reported (24.3%) utilization of PrEP (though this is rapidly increasing in many groups of MSM) and the majority of MSM living with HIV not currently receiving active medical care (Sanchez, 2017). Statistical models of MSM epidemics parameterized to represent US epidemics demonstrate that high levels of coverage of prevention services will be required to substantially reduce HIV incidence (Jenness, 2016), (Sullivan, 2012) and increased utilization of routine prevention activities like frequent HIV testing may enhance the efficacy of other interventions such as PrEP (Brookmeyer, 2014).

A growing area of focus in HIV research is the prediction of future behavior of MSM in relation to risk of acquiring and transmitting HIV, as well as future behavior or intention

to engage in prevention strategies (Furegato, 2018), (Evangeli, 2016), (Mackellar, 2011), (Rizza, 2012), (Veinot, 2016), (Wang, 2018). Since knowing one's HIV status is a crucial step to prevent HIV transmission, regular testing among sexually active Americans, but particularly among MSM, is vital to the health of individuals as well as to the efforts to reduce the national burden of HIV (Rizza, 2012). Studies have shown that the perceived empathy of service providers influences the behavioral intention of MSM to take up HIV antibody testing (Gu, 2015); therefore, facilities that are likely to lead to routine testing habits among MSM must be encouraged, studied, and replicated. Additionally, studies have also shown that MSM may not engage in prevention behaviors due to the stigma surrounding HIV and homosexuality, so it is vital that testing sites do not perpetuate stigma (Washington, 2013). The CDC currently recommends for high-risk populations, such as MSM, to get tested for HIV every three to six months (CDC, 2019).

There are many different types of HIV testing sites utilized by MSM, including but not limited to: private doctor's offices, community health centers, HIV counseling and testing sites, mobile testing units, hospitals, emergency rooms, STD clinics, drug treatment programs, correctional facilities, blood banks/plasma centers, military, and even at home testing kits. It cannot be assumed that the experience at each testing site is identical. One purpose for this analysis is to determine if any of these types of facilities are most likely to be associated with a future intention to continue to test for HIV antibodies among HIV negative MSM. Greater understanding of the relationship between recent testing site and future intention to test for HIV antibodies is needed in order to continue to effectively prevent the spread of HIV.

Previous research on intention to test for HIV among MSM has focused on many factors that impact future intention to test among MSM, including but not limited to psychological factors (Mackellar, 2011), reasons for testing (Evangeli, 2016, and stigma that could prevent testing (Noble, 2017). Other studies have indicated that the disparities faced by MSM, particularly among MSM of color, impact the intention to take up HIV antibody testing (Washington, 2013). This field currently faces a lack of research in determining whether or not a particular the type of last testing site utilized by MSM is associated with the future intention to test for HIV.

In predicting future testing intention, those last testing sites that are associated with an intention to test again in the foreseeable future could be identified as being most effective and prioritized in HIV prevention funding and marketing campaigns. The purpose of this article is to assess the association, among those M^3 study participants who tested negative for HIV, between where (the type of last testing site) M^3 study participants were last tested for HIV and when participants intend to next get tested. Those participants who tested positive for HIV are unlikely to undergo future HIV tests and will not be included in the analysis.

Methods

Data Source and Study Population

The Mobile Messaging for MSM study, a collaboration between the Centers for Disease Control and Prevention (National Center for HIV/AIDS, Hepatitis, STI, and TB Prevention, Division of HIV/AIDS Prevention, Prevention Research Branch), Emory

University, the University of Michigan, and Public Health Solutions, was conducted in 2018. The aim of the study was to test the efficacy of a mobile prevention messaging intervention for 1,226 HIV positive, HIV negative/High-Risk, and HIV negative/Low-Risk MSM in Atlanta, Detroit and New York City through a randomized-control prevention trial with an intervention waitlist-control, in increasing "net protection" against HIV transmission and acquisition. The primary outcomes of the original study include decreasing the number of condomless anal sex partners (stratified by partner type); increasing the proportion of men reporting 100% condom use (stratified by partner type); increasing STD testing; increasing HIV testing (HIV-negative MSM); increasing PrEP uptake and adherence (high-risk, HIV-negative MSM only); increasing ART uptake and adherence (HIV-positive MSM); and increasing engagement in HIV care (HIV-positive MSM). All demographic and clinical variables were obtained from the baseline survey conducted among participants.

In order to be enrolled, participants had to meet each of the following requirements:

* Assigned male at birth
* Current, self-reported gender identity as "Male"
* Aged 18 or over
* Self-reported ability to read and understand English-language
* Resides in the Atlanta, GA, New York, NY, or Detroit, MI MSA.
* Self-reported anal sex with a male partner in the past 12 months
* Owns and uses an Android or iOS smartphone
* Is included in one of the following risk groups, by self-report:

- HIV seropositive

- HIV seronegative at “higher risk” (condomless anal sex and not taking PrEP as prescribed in the past 3 months)

- HIV seronegative at “lower risk” (no condomless anal sex in the past 3 months, or condomless and sex while taking PrEP as prescribed in the past 3 months)

The study was restricted to men who self-report that they have had anal sex with a male within the past 12 months, as the aim of the research was to test the efficacy of messaging about risks and health services for MSM. Males age 18 years or younger are excluded, as well as anyone who was not assigned male at birth, or who currently identifies with a gender identity other than strictly “Male”.

Women, as well as transgender women, are excluded from the study because (1) effective HIV preventive interventions for women are likely to differ markedly from those focusing on men (particularly men who have sex with men), both in content and presentation; (2) the individual, socio-cultural and developmental factors associated with HIV risk in MSM are different from those for women; (3) the research questions and issues of relevance for MSM are not relevant or appropriate for women; (4) transgender women have unique HIV prevention messaging needs that differ from those of MSM and messages tailored for men would not be appropriate, (5) several effective HIV prevention interventions for women have already been developed, evaluated, and disseminated.

People under age 18 were excluded from the study because (1) effective HIV preventive interventions for teenagers are likely to differ markedly from those focusing on young adults and adults, both in content and presentation; (2) the individual, socio-cultural and developmental factors associated with HIV risk in MSM under 18 are different from

those for MSM 18 and up; and (3) the research questions and issues of relevance for MSM aged 18 and up may not be relevant or appropriate for MSM under age 18.

All participants were provided access to a computer with internet access at each study site. Study staff entered in the participant's study ID and initials. Initials were entered twice to confirm identification. All following surveys were provided via an online link sent to their email address. The survey URL link was appended with their study ID. Participants then entered their initials as a password to access their survey. The baseline assessment survey was hosted on the secure survey service SurveyGizmo.com, with whom Emory has established secure and compliant business practices. Any participants who required assistance operating the computer, or those who require assistance due to literacy issues, were provided assistance in a private room in the study site.

The data collected in the baseline assessment serves many procedural functions: 1) establish the baseline level of HIV and sexual health behaviors, as well as other study outcomes and covariates, in both our waitlist-control and intervention groups; 2) assign participants to one of the three categories of HIV-serostatus and risk (HIV positive, HIV negative/higher risk, HIV negative/lower risk); 3) tailor messages delivered by the intervention app (e.g., messages for men with primary partners).

To ensure that participants provided complete data and did not take undue advantage of the option to refuse answers, we identified a subset of our baseline enrollment questions deemed to be non-sensitive. If any participant failed or refused to answer 75% of these sentinel questions, they were administratively rejected from the study.

The baseline survey collected information on demographic characteristics, HIV and STD testing history and status, and condom use, PrEP use and adherence, ART use and adherence, knowledge, perceptions, beliefs, intents, communication with sex partners, mobile phone and data usage, access to internet and information, as well as psychosocial cofactors.

Type of Last Testing Site

The type of last testing site variable was collapsed from 12 original levels into four levels. This was done because some of the testing sites were inherently similar, for example mobile testing unit and HIV counseling and testing site, but also because of sample size limitations and analytical constraints. The table below illustrates how levels were collapsed:

Original Variable Levels	**New Variable Levels**
1. Private doctor's office	1. Private doctor's office
2. Community health center/public health clinic	2. Community health center/public health clinic
3. HIV counseling and testing site	3. HIV/STI testing
4. HIV/AIDS street outreach program/mobile testing unit	
5. STD clinic	
6. Emergency Room	4. Other
7. Hospital (inpatient)	

8. Drug Treatment Program	
9. Correction facility (jail/prison)	
10. Blood bank/plasma center	
11. Military	
12. At home	

Sexual Orientation

While the sexual orientation variable was originally four levels, it was dichotomized into Gay/Homosexual and Other due to both sample size and the scope of this study.

Race

To ensure adequate representation of minority populations in the study, the sample of 1,226 participants was composed of at least 30% participants of color (non-white and non-white Hispanic), or no fewer than 376 participants of color. The race variable was collapsed from 6 levels into 4, Black, White, Hispanic, and Other. There was originally a write-in option for race and this was examined and collapsed into the 4 categories listed above. These four categories were selected as they are of particular interest to the field of HIV study among MSM in America as well as sample size limitations.

Testing Recommendations

The official testing guidelines for sexually active MSM recommend being tested every three to six months (CDC, 2019). The main outcome of this analysis, intentions for future testing behavior, compared those participants who indicated at baseline that they intended

to test within the next six months and those who did not intend to test for HIV within the next six months. Future testing intention here was a secondary outcome of interest. This more lenient definition of official testing recommendations was decided upon in order to allow for differences in provider recommendations, variations in schedules, and frequency of sexual activity.

Determination of Future Testing Intention

The future testing intention variable, asking "When do you plan to next get tested for HIV?" was originally seven levels of time periods for next testing but was dichotomized into within six months and beyond six months. This was done based on testing recommendations for MSM as a high-risk population for acquiring HIV in America (CDC, 2019), but also in order to perform logistic regression as this is the outcome variable.

Inclusion and Exclusion Criteria for this Particular Study

Of the original Mobile Messaging for MSM study participants, only those who identified as HIV negative in the baseline survey were included in this analysis. HIV positive study participants were excluded because having tested positive, they are unlikely to engage in HIV as a preventative measure. The focus of this study was HIV testing among high-risk MSM in order to understand the future testing intention of this population. In that vein participants' whose HIV status was indeterminate, status unknown, or missing were also excluded from this analysis.

Data Analysis

All analyses were conducted using SAS® software, version [9.4] ("SAS/ACCESS® 9.4 ", 2013, Cary NC). Frequency and univariate procedures were used to determine the demographic characteristics for the entire study population and then by each level of the outcome, future testing intention. All variables were reported as counts and percentages. When using modeling procedures, the study's outcome (future testing intention) was limited to two levels: Intention to test in accordance with recommendations for high-risk populations, and no intention to test in accordance with recommendations for high-risk populations.

Univariate logistic regression models were fit to evaluate the unadjusted association between the main exposure, type of HIV testing facility, and each clinical and demographic variable and the outcome of future testing intention. Collinearity, interaction, and confounding assessments were performed on all potential covariates and interaction terms to determine the model used for final analysis. The final model was fit using multivariate logistic regression. A goodness-of-fit test using a Hosmer and Lemeshow methodology was then performed and a receiver operating characteristic (ROC) curve was produced to assess the final model's fit. Individuals who were missing values on any of the variables included in the final model were excluded from analysis.

All statistical analyses were conducted at a significance level of alpha = 0.05.

This study was approved by the Institutional Review Board at Emory University.

Results

Out of the 1,226 original Mobile Messaging for MSM study participants, 781 (64.8%) were HIV negative and included for analysis (Table I). Of the 781 total HIV negative participants, 364 (46.6%) participants were tested at a private doctor's office, 170 (21.8%) were last tested at a public health clinic or community health center, 122 (15.6%) were last tested at an HIV counseling and testing site, 94 (12.1%) were last tested at another type of facility (including military, prison, bloodbank, etc.), and 31 (4.0%) were missing the type of facility where they were last tested for HIV. Of these HIV negative participants, 662 (84.8%) indicated their intention to test for HIV again within the next 6 months. 119 (15.2%) indicated their intention to test for HIV again in more than 6 months or not at all. There were no missing observations for when participants intended to test again.

Most participants were 30 years of age or older (54.8%), white (51.9%), and possessed at least a college degree (63.9%). Most participants had health insurance (84.3%), identified as homosexual (86.6%), and were not taking PrEP at the time of the baseline survey (65.6%).

All 781 participants were included in univariate analyses (Table II). From these analyses, we determined that intention to test again within 6 months was positively and significantly associated with being Black (Prevalence Ratio (PR): 2.03, CI: 1.11-3.73) and taking PrEP (PR: 15.41, CI: 5.61-42.37). The only variable that was negatively and significantly associated with intention to test again within 6 months was being a participant in Detroit (PR 0.54, CI: 0.33-0.87). Neither age, sexual orientation, being Hispanic or being Other race, being in New York City, education, insurance status was not significantly associated

with the outcome. Finally, type of last testing site was not significantly associated with the outcome (p = 0.570, 0.572, 0.103).

A collinearity assessment found that only the main exposure, type of HIV testing site, and the intercept had VDP's greater than 0.5. The interaction assessment found no significant interaction between the exposure and other predictor variables (p = 0.487). Finally, a confounding assessment of all of the considered covariates found no confounding of the association between type of HIV testing location and future testing intention. After running these assessments, 727 (93.1% of total HIV negative) participants were used to fit a multivariate logistic regression model (Table III). Those HIV negative participants with missing values for predictor variables were excluded. Upon adjusting for age, sexual orientation, race, city, education, insurance status, and whether or not participants were currently taking PrEP, we determined that there was no significant difference between participants who were tested at different types of last testing sites (p = 0.79, 0.13, 0.62).

Finally, with the Homer and Lemeshow test of goodness of fit, we determined that the final model used for our analysis gave no evidence of poor fit (p = 1.0). Next, also using this final model, we generated an ROC curve that yielded an area under the curve result of 0.72. This means that the model performs with a good degree of discrimination.

Discussion

Summary

Using the data from the Mobile Messaging for MSM baseline survey, we examined the association between type of last HIV testing site and future testing intention among HIV

negative MSM. In both the univariate and multivariate analyses, we found that the type of last HIV testing site did not have a significant association with the future intention to test again according to recommendations for MSM or not.

Strengths

This study included participants from three cities representing different regions of the United States of America, making it more representative of the country.

This study did yield significant results in the association of taking PrEP with HIV testing intention. After adjusting for the other covariates, those taking PrEP were far more likely to indicate an intention to test for HIV again within the next 6 months (PR 17.13, $p < 0.0001$). Additionally, this study found that Black MSM in this sample were significantly more likely to indicate an intention to test for HIV again within the next 6 months (PR 2.12, $p = 0.04$).

Although this study yielded null results, it was the first, to the best of our knowledge, to study the association of type of last HIV testing site on intention to test again for HIV.

Limitations

As this was a cross-sectional study and the outcome merely future testing intention rather than actual behavior, this study provides less concrete results than if the outcome could have been future testing behavior (due to the potential for participants to feel compelled to answer that they would be testing sooner rather than later or to otherwise not follow through with their next HIV test). While this study did have a substantial sample size for

both the univariate and multivariate analyses (781 and 727 respectively), when considering the variation among different levels of different predictors, was much more limited. This means that the null results could have been due to insufficient power to detect the true associations.

While the sample size for this study was large, it cannot be seen as completely representative of the characteristics and experience of American MSM above the age of 18. As the study population was MSM living in Atlanta, Detroit, and New York, this study most likely underrepresents MSM from rural parts of the country. In addition, this study does not include any locations from several regions of the country.

This study did not take into account factors such as familial and social support or drug use, which could impact where and how often MSM engage in HIV testing. In addition, social/familial support variables have been found to be of particular importance for younger study participants (Bruce, 2015). Due to the design and permissions required in this study, MSM younger than 18 were not allowed to participate, meaning this study lacks data on an important population of MSM who are acquiring HIV at a particularly high rate (CDC, 2019). It is also important to note that this sample consisted of MSM who were at particularly high-risk of acquiring HIV, so they may be more sexually active than the general population of MSM in the United States and they may engage in more or fewer types of risky behaviors than the general population of MSM (Witzel, 2016).

Context

It is well-known that stigma against MSM, people living with HIV, and this intersectionality is negatively associated with HIV testing (Veinot, 2016). Less well-studied is the association between type of testing site and future intention to test, and the possibility of perpetuation of stigma in certain types of testing sites. Continued studies into the effect of testing site on future testing behavior are necessary in order to determine how effective different types of testing sites are at instilling the importance of regular HIV testing among MSM, as well as in determining the presence or effect of stigma and type of testing site.

Due to structural inequities surrounding race and healthcare, Black MSM face a higher risk of acquiring HIV than do white MSM (Goodreau, 2017), (Trepka, 2018). However, as mentioned previously, this study found an association between Black MSM and future testing intention when compared to White MSM. This finding will require more study, but could be an indication of an effective prevention strategy among this high-risk population.

Future Work and Public Health Implications

While the null results indicate no association between type of last testing site and future testing intention, future studies wishing to examine the association between type of testing site and future testing intention could enroll participants in collaboration with a wide variety of testing sites in order to allow greater sample size for sites such as the military, prison, or home testing kits.

Although this study yielded no association between the type of testing site and future testing intention, the associations of HIV testing related variables, such as the type of practitioner administering the test, with future HIV testing intention and HIV testing behaviors should continue to be studied.

Conclusion

The results of this study indicate that type of last testing site is not associated with future testing intention and should not be weighted heavily when attempting to predict future testing behaviors. However, more frequent and regular testing for MSM, especially high-risk MSM, is crucial to the field of public health's efforts in HIV prevention (CDC, 2019). The associations between other factors surrounding testing and future HIV testing intentions/behaviors should continue to be studied in order to better understand and predict HIV testing behaviors among MSM and reduce the burden of disease of HIV.

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Tables

Table I. Demographic characteristics of HIV-negative Mobile Messaging for MSM Study Participants by study site, Atlanta, Detroit and New York, 2018

Characteristic	Total (n=781)	Atlanta (n=276) (35.3%)	Detroit (n=237) (30.3%)	NYC (n=268) (34.3%)
Age (years)				
18-29	353 (45.2%)	110 (39.9%)	125 (52.7%)	118 (44.0%)
30+	428 (54.8%)	166 (60.1%)	112 (47.3%)	150 (56.0%)
Missing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Sexual Orientation				
Homosexual or Gay	676 (86.6%)	241 (87.3%)	197 (83.1%)	238 (88.8%)
Other	104 (13.3%)	35 (12.7%)	39 (16.5%)	30 (11.2%)
Missing	1 (0.1%)	0 (0.0%)	1 (0.4%)	0 (0.0%)
Race/Ethnicity				
Black	155 (19.8%)	72 (26.1%)	37 (15.6%)	46 (17.2%)
White	405 (51.9%)	154 (55.8%)	137 (57.8%)	114 (42.5%)
Hispanic	61 (7.8%)	11 (4.0%)	23 (9.7%)	27 (10.1%)
Other	160 (20.5%)	39 (14.1%)	40 (16.9%)	81 (30.2%)
Missing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Education				
Less than college degree	282 (36.1%)	100 (36.2%)	105 (44.3%)	77 (28.7%)
College degree plus	499 (63.9%)	176 (63.8%)	132 (55.7%)	191 (71.3%)
Missing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Insurance Status				
Insured	658 (84.3%)	216 (78.3%)	207 (87.3%)	235 (87.7%)
Uninsured	121 (15.5%)	60 (21.7%)	30 (12.7%)	31 (11.6%)
Missing	2 (0.3%)	0 (0.0%)	0 (0.0%)	2 (0.8%)
Taking Prep				
Yes	243 (31.1%)	88 (31.9%)	56 (23.6%)	99 (36.9%)
No	512 (65.6%)	181 (65.6%)	170 (71.7%)	161 (60.1%)
Missing	26 (3.3%)	7 (2.5%)	11 (4.6%)	8 (3.0%)
Type of Testing site				
Private doctor's office	364 (46.6%)	135 (48.9%)	101 (42.6%)	128 (47.8%)
Public health clinic	170 (21.8%)	33 (12.0%)	56 (23.6%)	81 (30.2%)
HIV counseling and testing site	122 (15.6%)	69 (25.0%)	33 (13.9%)	20 (7.5%)
Other	94 (12.1%)	31 (11.3%)	31 (13.1%)	32 (12%)
Missing	31 (4.0%)	8 (2.9%)	16 (6.8%)	7 (2.6%)
Future Intention to Test				
Within the next 1-6 months	662 (84.8%)	243 (88.0%)	189 (79.8%)	230 (85.8%)
In 6 months or more from now, or not at all	119 (15.2%)	33 (12.0%)	48 (20.3%)	38 (14.2%)
Missing	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Table II. Unadjusted associations between type of testing site and future testing intention among HIV-negative men who have sex with men, Atlanta, Detroit and New York, 2018

Characteristic	Total (n=781)	Intention to test within 6 months (n=662)	No intention to test again w/i 6 months (n=119)	PR	Lower 95% CI	Upper 95%CI	p-value
Age (years)*							
18-29	353	301	52	Ref			
30+	428	361	67	0.93	0.63	1.38	0.721
Missing	0						
Sexual Orientation							
Homosexual or Gay	676	575	101	Ref			
Other	104	86	18	0.84	0.48	1.46	0.532
Missing	1						
Race/Ethnicity							
Black	155	141	14	2.03	1.11	3.73	0.022
White	405	337	68	Ref			
Hispanic	61	49	12	0.82	0.82	1.63	0.578
Other	160	135	25	1.09	1.09	1.80	0.737
Missing	0						
City/MSA							
Atlanta	276	243	33	Ref			
NYC	268	230	38	0.82	0.50	1.36	0.44
Detroit	237	189	48	0.54	0.33	0.87	0.011
Education							
Less than college degree	282	239	43	Ref			
College degree plus	499	423	76	1.00	0.67	1.50	0.995
Missing	0						
Insurance Status							
Insured	658	558	100	1.04	0.61	1.77	0.886
Uninsured	121	102	19	Ref			
Missing	2						
Taking Prep							
Yes	243	239	4	15.41	5.61	42.37	<0.0001
No	512	407	105	Ref			
Missing	26						
Type of Testing site							
Private doctor's office	364	315	49	Ref			
Community health center	170	144	26	0.862	0.52	1.44	0.570
HIV counseling/testing site	122	108	14	1.2	0.64	2.26	0.572
Other	94	75	19	0.61	0.34	1.10	0.103
Missing	31						

Table III. Adjusted associations between type of testing site and future testing intention among HIV-negative men who have sex with men, Atlanta, Detroit and New York, 2018

Characteristic	Total (n=727)	Intention to test (n=625)	No intention to test (n=102)	PR	Lower 95% CI	Upper 95%CI	p-value
Age (years)*							
18-29	322	279	43	Ref			
30+	405	346	59	0.82	0.52	1.29	0.38
Sexual Orientation							
Homosexual or Gay	647	558	89	Ref			
Other	80	67	13	1.02	0.53	1.99	0.95
Race/Ethnicity							
Black	140	129	11	2.12	1.04	4.35	0.04
White	387	326	61	Ref			
Hispanic	56	46	10	0.59	0.26	1.37	0.22
Other	144	124	20	0.85	0.45	1.61	0.62
City/MSA							
Atlanta	262	232	30	Ref			
NYC	252	220	32	0.99	0.55	1.78	0.97
Detroit	213	173	40	0.70	0.40	1.21	0.20
Education							
Less than college degree	251	217	34	Ref			
College degree plus	476	408	68	0.86	0.52	1.40	0.53
Insurance Status							
Insured	616	529	87	0.89	0.47	1.69	0.73
Uninsured	111	96	15	Ref			
Taking Prep							
Yes	238	234	4	17.13	6.12	47.95	<0.0001
No	489	391	98	Ref			
Type of Testing site							
Private doctor's office	357	309	48	Ref			
Community health center	160	137	23	1.09	0.60	1.96	0.79
HIV counseling and testing site	120	107	13	1.72	0.86	3.45	0.13
Other	90	72	10	0.85	0.45	1.61	0.62