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Uptake and Predictors of Anal Cancer Screening in Men Who Have Sex with Men

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Abstract

OBJECTIVES—To understand attitudes about and acceptance of anal Pap screening among men who have sex with men (MSM).

METHODS—1742 MSM in the Multicenter AIDS Cohort Study (MACS) were offered free anal Pap screening (cytology) and reported history of, attitudes about, and experience with anal Pap screening. Predictors of declining screening were explored with multivariate logistic regression.

RESULTS—A history of ever having anal Pap screening was uncommon among HIV-uninfected MSM, but more common among HIV-infected MSM (10% vs. 39%, $p < 0.001$). Most participants expressed moderate or strong interest in anal Pap screening (86%), no anxiety about screening (66%), and a strong belief in the utility of anal Pap screening (65%). Acceptance of anal Pap screening offered during this study was high (85%) across all four U.S. study sites. Among those screened, most reported it was not a big deal, or not as bad as expected, while 3% reported it was scary. Declining to have anal Pap screening was associated with Black race, anxiety specifically about the screening, and low interest in screening, but not age or HIV status.

CONCLUSIONS—This study demonstrated high acceptance of anal Pap screening among both HIV-infected and HIV-uninfected MSM across four U.S. study sites.

INTRODUCTION

In the past three decades, anal cancer incidence has increased 39% in women and 96% in men in the U.S..^{1–3} In the general U.S. population, anal cancer incidence remains higher among women than men (1.8 vs. 1.4 cases per 100,000 annually), but the incidence is especially high among men who have sex with men (MSM) (35 per 100,000).^{4–6} Indeed, data suggest anal cancer incidence among MSM may be similar to or higher than incidence of cervical cancer among U.S. women prior to the introduction of cervical cytology screening in the mid-1950s.^{1,7–13} Incidence estimates for HIV-infected MSM are even higher and vary from 45.9/100,000 person-years¹⁴ in meta-analyses to 78.2/100,000 person-

years¹⁵ for U.S. AIDS case surveillance and Surveillance Epidemiology and End Results (SEER) data.

Human papillomavirus (HPV) infection is the major cause of anal cancer.^{14,16–18} Consistent with the increased anal cancer incidence among MSM, anal HPV prevalence and incidence are elevated among MSM compared to the general population.^{19,20} HIV-infected MSM have even higher anal HPV prevalence, compared to HIV-uninfected MSM (98% vs. 57%).^{21,22} As effective antiretroviral therapy (ART, also referred to as HAART) helps HIV-infected individuals live longer, more may now develop anal cancer.^{6,23,24} Based on initial studies, it is unclear whether ART use reduces risk of anal intraepithelial neoplasia (AIN2/3, precancer)²⁵ or anal cancer,^{26,27} although low CD4 cell count does appear to increase risk of anal cancer.²⁸

Recent research suggests that anal Pap screening may have utility in preventing anal cancer^{9,29–31} and is a cost-effective screening method for anal cancer prevention among MSM^{32,33}. Like cervical dysplasia, anal dysplasia is slow growing and treatable, and studies suggest anal Pap tests can detect dysplasia with similar sensitivity and specificity to cervical Pap tests.^{34–36} Based on these data and the success of cervical Pap screening in reducing cervical cancer incidence, some have proposed routine anal Pap cytology (referred to as anal Pap screening hereafter) among MSM.^{9,37} However, these guidelines remain preliminary as researchers have not yet conducted a randomized trial to establish whether anal Pap screening reduces anal cancer deaths. Further, recent studies suggest anal pre-cancers (AIN2+) are relatively common among unscreened HIV-uninfected (~4%) and HIV-infected (15–30%) MSM, much higher than anal cancer rates, so other researchers suggest that closer examination of the relative harms and benefits of treating all AIN 2/3 in MSM is first needed.^{36,38–42}

Despite the high incidence of anal cancer among MSM and recommendations, by some, for screening, MSM currently have low awareness of, access to, and use of anal Pap screening.^{43,44} Indeed, in our previous research we observed a low reported prevalence of ever having anal Pap screening among MSM.⁴⁵ The present study expands on these previous findings by examining acceptance of screening when offered for free. We also examine attitudes about anal Pap screening, experience with screening, and reasons for declining to have an anal Pap.

METHODS

Participants and Recruitment

All men in the Multicenter AIDS Cohort Study (MACS) were eligible to participate in the Anal Health Study. The MACS is an ongoing prospective study of HIV-infected and uninfected MSM, recruited across four sites (Baltimore, Chicago, Pittsburgh, Los Angeles) over three separate enrollment periods (1984–1985, 1987–1991 and 2001–2003), as described previously.^{46,47} All MACS participants who attended any of their semiannual MACS study visits between June 2010 – July 2011 (MACS visits 53–55) were eligible to be offered a free anal Pap test by study staff. Individuals who conducted phone interviews only were not invited to participate.

Procedures

Participants completed a computer assisted self interview (CASI) baseline questionnaire 6 months before (52%) or just prior to (48%) being offered anal Pap screening. They were offered an anal Pap test after receiving an informational brochure about screening, and had an opportunity to ask study staff questions. Each participant undergoing screening provided

written informed consent for the procedure. Participants completed a follow-up CASI questionnaire at the next visit after they were offered anal Pap (usually 6 months later).

Measures

Anal Pap Acceptance and Decline—The primary outcome was Pap acceptance or decline as documented by study staff.

Attitudes and Experiences with Anal Pap Screening—The baseline questionnaire included history of anal Pap testing as well as attitudes such as anxiety about, interest in and familiarity with anal Pap screening (Appendix). The follow-up questionnaire measured experience related to receiving the screening or reasons for decline of the anal Pap test when offered free of cost at a prior MACS visit (Appendix). Among men who declined screening, 87% provided a reason, and 13% left this question unanswered in the questionnaire.

Covariates—During each semiannual MACS visit self-administered and computer-aided questionnaires assessed potential covariates.⁴⁸ *Demographic* factors were age (<45, 45–54, 55–64, 65 years), study site, education (college degree: yes, no, unknown), individual yearly income (<\$60,000, \$20,000–\$59,999, \$19,000), unknown/chose not to report), and race/ethnicity (White non-Hispanic, Black non-Hispanic, and all others). *Behavioral factors* were history of prior anal Pap test (yes, no) and number of anal receptive sex partners (0, 1–2, and >2) in the past six months (defined as the number of sex partners with whom the participant was the receptive partner). *Health status indicators* were HIV status/current CD4 cell count (HIV uninfected, HIV infected: CD4 >500, 300–499, and <300 cells/ μ L) and current use of ART. Our analyses used covariate data from the same MACS visit at which anal Pap screening was offered to participants.

Data Analyses

Chi-square tests were used to evaluate differences in categorical variables (Fischer's exact test used for small cell sizes) by HIV serostatus. Predictors of declining screening were explored using univariate and multivariate logistic regression. Variables which were statistically significant in the univariate model or were regarded as important in the literature (age, income, college education, and HIV status/current CD4 cell count) were included in multivariate models and were removed in a step-wise fashion; variables regarded as important in the literature were retained in the final multivariate models regardless of significance. All analyses were performed using STATA 11.0.

RESULTS

Analyses included data for 1742 men who were offered anal Pap screening as part of their semi-annual MACS Study visit. These men represent 78% of all MACS participants in active follow-up between June 2010 – July 2011. The other 504 men in active follow-up were excluded from this study because they were not offered screening (usually because they had reduced study visits due to time constraints or their interviews happened by phone, Figure 1). Compared to men who were offered screening, men who were not offered screening were younger, had lower current CD4 cell count, were more likely to be HIV-infected, non-Hispanic Black or Other race, and to be from the Los Angeles study site (Table 1).^{47,49,50} Our baseline questionnaire was completed by 95% (1662/1742) of the men who were offered screening.

Anal Health Study participants were primarily non-Hispanic White (67%) or non-Hispanic Black (20%), with a median age of 55 years (interquartile range=49–61), Table 1. Nearly half of participants (47%) reported having a college degree, and only 3.7% had not

completed high school or equivalent. The median annual gross income was between \$40,000–49,000. Among the HIV-infected men, 94% were currently taking ART, median current CD4 cell count was 586 cells/ μ L (IQR=425–753), and 80% had HIV viral load below the detectable level (< 40 RNA copies/mL). Of the 1742 men offered anal Pap screening (Figure 1), there were 12 men with a confirmed history of anal cancer, including 11 of 820 HIV-infected men (prevalence=1.34%) and 1 of 922 HIV-uninfected man (prevalence=0.11%).

Anal Health History and Attitudes Regarding Anal Pap Screening (Baseline Questionnaire)

Twenty-three percent of men (388/1662) reported ever having had anal Pap screening in the past, an increase from 2007 when 11% of men in the MACS cohort had ever been screened. In the present study, HIV-infected men were more likely to have been previously screened compared to HIV-uninfected men (39% vs. 10%, $p<0.001$). Among those who reported having been screened at least once, 51% (138/269) of HIV-infected and 14% (11/76) of HIV-uninfected men reported having at least one abnormal Pap test result ($p<0.001$). Forty-four percent of the 388 men who had ever had anal Pap screening reported the year they had last been screened, and most (63%) of these 172 men had been screened within the past three years. History of genital or anal warts was reported by 24% of participants. Very few of these adult MSM reported being vaccinated with any doses of HPV vaccine (1.4%).

Although most men in the study had never had an anal Pap test, many participants reported strong interest in screening (51%), no anxiety about screening (66%), and a strong belief in the utility of anal Pap screening (65%). Specifically, only 14% of participants reported no interest in anal Pap screening, and only 3% thought screening was not at all useful. HIV-infected men were more likely than HIV-uninfected men to be very interested in (55% vs. 47%, $p=0.007$) and very familiar with (39% vs. 14%, $p<0.001$) anal Pap screening. HIV-infected men were less likely than HIV-uninfected men to be not at all familiar with what is involved with having an anal Pap (43% vs. 26%, $p<0.001$).

Complete lack of familiarity with the anal Pap test was reported more frequently by men in Los Angeles (53%), compared to 36% of men in Baltimore, 29% of men in Chicago and 20% of men in Pittsburgh ($p<0.001$). High anxiety about anal cancer screening was uncommon at all sites, ranging between 6–12% of men. Lack of interest (not at all interested) in getting the anal Pap screening, the strongest risk factor for Pap decline, was reported by 12%, 12%, 14% and 18% of participants in Baltimore, Chicago, Pittsburgh and Los Angeles respectively.

Acceptance of Anal Pap screening

Overall, 85% of men accepted anal Pap screening when offered (Figure 1). Among those screened in the study and who responded regarding the experience ($n=886$), a large majority reported that they thought it was not a big deal (83%) and was not as bad as they expected (62%), although 19% of participants reported they thought the procedure was uncomfortable (Table 2). Among 214 men who reported anxiety about anal Paps in the pre-screening questionnaire and subsequently were screened, 149 (70%) reported that the experience was not as bad as expected. Reported experience with Pap was also similar among men who had never been screened, and men who had been previously screened, including similarly high rates reporting it was a not a big deal (82% vs 85, $p=0.51$), not as bad as expected (64% vs 58%, $p=0.22$), and similar moderate levels reporting it was uncomfortable (19% vs 18%, $p=0.91$)

The primary reason reported for declining screening was already getting anal Pap testing from another source/provider (68/263, 26%) (Table 2). Other reasons for not getting

screening included: not having anal receptive sex (19%), expected discomfort during screening or physical/emotional unpreparedness (17%), not interested in anal Pap screening (13%), felt that they did not know enough about the screening (8%), or another reason (apprehension over waiting for/knowing result of screening or resulting referral for follow-up care; 3%).

History of anal Pap testing was similar among men in Baltimore (22%) and Los Angeles (22%), slightly lower among those in Chicago (18%) and higher among those in Pittsburgh (31%, $p < 0.001$). Decline of the free anal Pap screening was low at all four MACS study sites, ranging from 8% in Chicago to 26% in Pittsburgh, where the study has an active anal dysplasia clinic, and men were more likely to have been recently screened. Getting an anal Pap elsewhere was cited as the reason for declining to be screened in 26%–31% of men at Pittsburgh, Los Angeles and Baltimore, but among only 4% of men in Chicago.

Correlates of Refusing (Deciding Not to Have) Anal Pap Screening

Analyses of factors associated with refusing anal Pap screening excluded 61 men who decided not to be screened because they received Pap screening elsewhere. In univariate analysis, declining anal Pap screening was associated with demographic factors (younger age, non-Hispanic Black race, lower income, not having a college degree) and attitudinal factors (anxiety about screening, lack of belief in the utility of screening, and lack of interest in Pap screening), but not with HIV status, number of recent anal receptive sex partners, or familiarity with anal Pap testing (Table 3). Screening acceptance was as high among men who said they had never been screened before (88%) as among men who reported having been screened in the past (92%).

In multivariate analysis, anal Pap refusal remained associated with non-Hispanic Black ethnicity (OR=2.16, 95% CI=1.18–3.9), reported moderate anxiety (OR=1.68, 95% CI=1.01–2.8) or high anxiety (OR=2.85, 95% CI=1.27–6.4) about screening, and being not at all interested (OR=33, 95% CI=17–65) or only somewhat interested (OR=4.5, 95% CI=2.4–8.4) in screening (Table 3). Correlates of Pap decline were similar when restricted to only men expressing interest in screening (results not shown).

DISCUSSION

This study identified high acceptance of anal Pap screening when offered for free to MSM in a multicenter U.S. study. Acceptance was equally high among both HIV-infected and HIV-uninfected men. Although they were active participants of the MACS research study, the majority of these men had never had anal Pap screening and were not very familiar with the procedure. When given the opportunity to be screened, most expressed strong interest and belief in its utility and chose to be screened. Furthermore, men who did and did not have a history of prior anal Pap screening reported a similar, positive experience after the screening suggesting that it was well tolerated by the majority of study participants.

These findings are consistent with reports published by others. For example, 82% of HIV-infected Miami HIV-clinic attendees accepted anal cancer screening in a cross-sectional study; however, rationale for accepting or declining screening was not evaluated in that study⁵¹. Earlier MACS analyses (from 2007) showed 29% of participants reported they were possibly or likely to get screened outside of the study in the following six months⁴⁵. However, our current analyses suggest that many of these men had not been screened in the interval, but screening was accepted when offered conveniently and free of charge in our study.

The proportion of MSM who reported lack of familiarity with anal Pap testing was lower in our study (35%) than two earlier studies, where 60–77% of MSM were not aware of what is involved in anal Pap testing^{43,52}, perhaps because we had previously asked them about this topic. In one of the previous non-MACS studies, 63% of MSM reported they did not know whether doctors recommend anal Pap testing for MSM⁴³, which may be in part because many MSM do not disclose their sexual behavior with men to their primary care providers. In this study, familiarity with Pap testing varied by study site. Men in Pittsburgh, where the study is associated with an active anal dysplasia clinic, were more likely to report familiarity with anal Pap testing, and to decline anal Pap testing because they had already been recently screened. Familiarity with Pap testing at study baseline was lower in Los Angeles than the other study sites, which might represent regional differences in availability and awareness of anal Pap screening⁵³

Among the minority of men who declined screening, the most commonly reported reasons were related to not having anal sex (suggesting they perceived themselves to be at lower risk), concern about discomfort related to screening, and feeling like they did not know enough about anal Pap testing. Studies evaluating barriers to anal cancer screening have also reported that patient embarrassment, fear of discomfort during the procedure³³ and primary-care providers giving little emphasis to anal Pap testing^{43,54} are factors which may hinder screening acceptance. However, distribution of informational packets on anal cancer and Pap screening can improve anal Pap uptake⁵⁵. Providing information may have contributed to the high acceptance of anal cancer screening in our study, in which informational brochures and knowledgeable staff were available to participants.

Although most participants were very interested in and not anxious about anal cancer screening, men who reported low interest in or high anxiety about screening were, not surprisingly, more likely to decline screening. Indeed, men who said they were not at all interested in anal Pap screening at baseline, later cited reasons for decline of the free anal Pap that mirrored this disinterest such as “I don’t have anal receptive sex” and “I don’t know enough about it”. Our findings suggest that attitudes may explain declining anal Pap screening when cost and availability needs are met. Attitudinal factors such as interest in anal cancer screening, anxiety regarding the procedure and belief in the utility of anal cancer screening should be considered when developing screening programs.

Once screened, most men reported a positive experience: among men who reported anxiety about screening the majority reported the experience was not as bad as expected. Anal Pap familiarity and refusal varied somewhat by study site, which is likely due to better availability of Pap screening before the sub-study started at some sites. However, other reasons for the variation may include comfort with the staff performing the exam or gender of the examiner. Sites with only a female clinician anecdotally reported some men not wanting to have an anal Pap performed by a female clinician.

Anal Pap testing, like cervical Pap testing, is known to have imperfect sensitivity and specificity^{30,34,56} and therefore while it may be useful as a screening test it cannot be used as a diagnostic test. Unfortunately, few providers have the technical expertise to perform high resolution anoscopy (HRA), the diagnostic test for anal pre-cancer and cancer^{9,32}. If screening is found to have clear benefit in this community and use increases, it will be critical to ensure an adequate supply of physicians trained to perform high resolution anoscopy who can diagnose and treat individuals with abnormal Pap results.

This study has several limitations as well as strengths. We did not have data on participants’ experience surrounding previous anal Pap screening or on provider motivators for offering or not offering screening. Also, screening history was self-reported and thus may reflect

some recall errors. The completion rate for the follow-up survey was lower than desirable, due to missing visits by some study participants, and limited time of other participants leading to their not completing the survey. The study had several strengths including a standardized protocol at all sites, a large well-characterized sample of HIV-uninfected and HIV-infected MSM, and detailed behavioral and biologic data collection. Further the prospective study design followed participants up to six months before and six months after offering anal Pap screening. Participants in the MACS study might exhibit higher acceptance rates than the general MSM population due in part to their participation in a study on HIV and MSM health behaviors. However, the MACS cohort was recruited using standard procedures based on network theory and social marketing from bars, organizations, websites, and other community venues.⁴⁶ As in other studies, study participants may differ from non-participants, therefore the generalizability of our findings to other populations of MSM will need to be established. Nevertheless our findings are informative among a diverse, well-characterized sample of MSM from different geographical regions in the US.

This study provides new information about interest in and uptake of anal Pap screening, as well as factors associated with screening. This study suggests that without cost and availability barriers many MSM are interested in anal cancer screening, but modifiable attitudinal factors may hinder some MSM from being screened. Additional research is needed to clarify the benefits and harms of anal Pap testing. As abnormal anal cytology is relatively common among MSM, it will be important to avoid overtreatment by having appropriate referral and treatment algorithms, which need to be better outlined. If screening is shown to be effective it will be important to ensure information about screening and Pap screening for MSM are both available, especially at the point of primary care.

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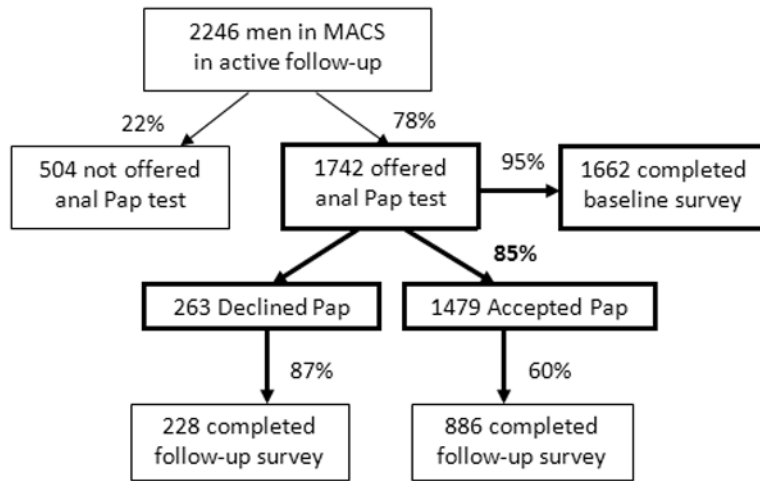


Figure 1.
Diagram of study participation.

Table 1

Characteristics of study participants offered anal Pap test.

	N (%)				P-value
	Not Offered N=504	Offered N=1,742	Declined Pap N=263	Accepted Pap N=1479	
Median age (interquartile range)	51 (44–57)	55 (49–61)	51 (46–57)	55 (49–61)	-
Race/ethnicity					
Non-Hispanic Black	130 (26%)	351 (20%)	89 (33%)	262 (18%)	
Non-Hispanic White	237 (47%)	1172 (67%)	123 (47%)	1049 (71%)	
Other/Unknown	137 (27%)	219 (13%)	51 (20%)	168 (12%)	<0.001
Education					
College degree or higher	44 (9%)	814 (47%)	92 (35%)	722 (49%)	
< College degree	106 (21%)	473 (27%)	104 (39%)	369 (25%)	
Unknown/not reported	354 (70%)	455 (26%)	67 (25%)	388 (26%)	<0.001
Annual income					
>\$40,000	32 (6%)	685 (39%)	66 (25%)	619 (42%)	
\$40,000	116 (23%)	653 (37%)	125 (47%)	528 (36%)	
Unknown/not reported	356 (71%)	404 (23%)	72 (27%)	332 (22%)	<0.001
City of recruitment					
Baltimore	83 (16%)	426 (25%)	68 (26%)	358 (24%)	
Chicago	103 (20%)	315 (18%)	26 (10%)	289 (20%)	
Pittsburgh	82 (16%)	477 (27%)	123 (47%)	354 (24%)	
Los Angeles	236 (47%)	524 (30%)	46 (18%)	478 (32%)	<0.001
Number of anal sex partners in the past six months where the study participant was the receptive partner					
0	81 (16%)	829 (48%)	110 (42%)	719 (49%)	
1–2	111 (22%)	516 (30%)	57 (22%)	459 (31%)	
>2	100 (20%)	291 (17%)	25 (10%)	266 (18%)	
Missing	212 (42%)	106 (6%)	71 (27%)	35 (2%)	<0.001
HIV status					
Infected	282 (56%)	820 (47%)	123 (47%)	697 (47%)	
Uninfected	220 (44%)	922 (53%)	140 (53%)	782 (53%)	0.915

	N (%)					
	Not Offered N=504	Offered N=1,742	P-value	Declined Pap N=263	Accepted Pap N=1479	P-value
Current CD4 cell count* (cells/μL)						
500	199 (67%)	1383 (79%)		212 (81%)	1170 (79%)	
300–499	62 (21%)	266 (15%)		36 (14%)	229 (16%)	
<300	36 (12%)	91 (5%)	<0.001	13 (5%)	78 (5%)	0.749

* Among men who were not offered the anal Pap, CD4 cell count was missing for 207 men

Table 2

Reported experience with and reasons for declining (refusing) anal pap screening

	All	HIV-Infected	HIV-Uninfected	P-value
Reported experiences among those who <u>accepted</u> Pap screening	N=886	N=395	N=491	
Not a big deal	734 (83%)	323 (82%)	411 (84%)	0.58
Not as bad as expected	548 (62%)	254 (64%)	294 (60%)	0.32
It was uncomfortable	164 (19%)	65 (16%)	99 (20%)	0.34
It was scary	26 (3%)	16 (4%)	10 (2%)	0.18
It was necessary	696 (79%)	337 (85%)	359 (73%)	<0.001
Main reason for <u>declining</u> Pap	N=263	N=123	N=140	
Already get anal Pap at other clinic	68 (26%)	47 (38%)	21 (15%)	<0.001
Don't have anal receptive sex	51 (19%)	13 (11%)	38 (27%)	0.001
Would feel uncomfortable/physically unprepared	46 (17%)	17 (14%)	29 (21%)	0.14
Not interested	34 (13%)	22 (18%)	12 (9%)	0.03
Don't know enough about it	22 (8%)	6 (5%)	16 (11%)	0.06
Don't want to know if I have anal cancer/stress of waiting for results/cost and burden of follow-up care	7 (3%)	1 (1%)	6 (4%)	0.08
Did not report reason/did not recall why declined	35 (13%)	17 (14%)	18 (13%)	0.82

Note. Reported experience is for 886 screened participants who answered all five of the attitudinal items from the post-screening questionnaire regarding their Pap testing experience in the Anal Health Study. Results were similar when another 183 screened individuals who only partially answered the questionnaire (i.e., did not answer some questions) were included.

Table 3

Univariate and multivariate predictors of decline (refusal) of anal Pap test when offered free of cost.

	Declined Pap N (%) [^]	Univariate OR (95%CI)	Multivariate OR (95%CI)
Overall	117/1,091 (11%)		
Demographics			
Age			
65 yrs	8/118 (7%)	1.00	1.00
55 and <65 yrs	33/413 (8%)	1.19 (0.54–2.7)	0.96 (0.40–2.3)
45 and <55 yrs	43/382 (11%)	1.74 (0.80–3.8)	1.17 (0.47–2.8)
<45 yrs	33/178 (19%)	3.12 (1.39–7.0)	1.21 (0.46–3.2)
Race and Ethnicity			
Non-Hispanic White	69/806 (9%)	1.00	1.00
Non-Hispanic Black	37/185 (20%)	2.67 (1.75–4.1)	2.15 (1.18–3.9)
All Other [*]	11/100 (11%)	1.32 (0.67–2.6)	1.46 (0.63–3.5)
Individual Gross Income			
\$60,000	22/345 (6%)	1.00	1.00
\$20,000 and <\$60,000	38/350 (11%)	1.79 (1.03–3.1)	1.60 (0.84–3.0)
\$19,000	48/242 (20%)	3.63 (2.12–6.2)	1.70 (0.83–3.5)
Unknown	9/154 (6%)	0.91 (0.41–2.0)	0.95 (0.35–2.6)
Degree/4 yrs college or higher			
Yes	56/605 (9%)	1.00	1.00
No	53/316 (17%)	2.00 (1.32–3.0)	1.19 (0.71–2.0)
Unknown	8/170 (4%)	0.48 (0.23–1.04)	0.48 (0.18–1.30)
City of recruitment			
Los Angeles	22/308 (7%)	1.00	1.00
Chicago	11/139 (8%)	1.12 (0.53–2.4)	0.90 (0.36–2.3)
Baltimore	25/301 (8%)	1.18 (0.65–2.1)	1.93 (0.95–4.0)
Pittsburgh	59/343 (17%)	2.70 (1.61–4.5)	3.04 (1.58–5.9)
Attitudes and Behaviors			
Anxious about anal Pap			
Not at all	62/735 (8%)	1.00	1.00
Somewhat	41/274 (15%)	1.91 (1.25–2.9)	1.68 (1.01–2.8)
Very	14/82 (17%)	2.23 (1.19–4.2)	2.83 (1.27–6.4)
Interested in anal Pap			
Very	17/580 (3%)	1.00	1.00
Somewhat	47/385 (12%)	4.61 (2.60–8.2)	4.49 (2.42–8.4)
Not at all	53/126 (42%)	24.0 (13.2–43.7)	32.0 (16.3–62.7)
Familiar with anal Pap			
Very	26/261 (10%)	1.00	-
Somewhat	40/446 (9%)	0.89 (0.53–1.5)	-

	Declined Pap N (%)[^]	Univariate OR (95%CI)	Multivariate OR (95%CI)
Not at all	51/384 (13%)	1.38 (0.84–2.3)	-
Belief in utility of anal Pap			
High	60/713 (8%)	1.00	-
Moderate	50/346 (14%)	1.84 (1.23–2.7)	-
No	7/32 (22%)	3.05 (1.27–7.3)	-
Ever had anal Pap			
No	93/800 (12%)	1.00	-
Yes	24/291 (8%)	0.68 (0.43–1.09)	-
Recent Anal receptive sex			
Yes	50/535 (9%)	1.00	-
No	67/556 (12%)	1.33 (0.90–2.0)	-
Health Status			
HIV status & current CD4 cell count (cells/μL)			
HIV uninfected	71/605 (12%)	1.00	1.00
HIV infected CD4 500	28/303 (9%)	0.77 (0.48–1.21)	0.65 (0.37–1.13)
HIV infected CD4 300–499	12/128 (9%)	0.78 (0.41–1.48)	0.60 (0.27–1.31)
HIV infected CD4 <300	6/55 (11%)	0.92 (0.38–2.2)	0.56 (0.20–1.57)

[^] The results in this table are among 1,091 individuals with complete covariate data, an excluding 61 men who reported receiving screening elsewhere as their reason for decline. Univariate results among all 1742 individuals offered anal Pap screening were similar to those among this group with complete data. Bolded odds ratios are statistically significant ($p < 0.05$).

* “All Other” Race includes Hispanic Black/White (N=54) American Indian or Alaskan Native (N=4), Asian or Pacific Islander (N=5), Other non-Hispanic (N=10), Other Hispanic (N=26) and did not report (N=1)