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The Relationship between Outness to Healthcare Providers and HIV testing

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The Relationship between Outness to Healthcare Providers and HIV testing

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2017

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An abstract of
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Abstract

The Relationship between Outness to Healthcare Providers and HIV testing
By David Wang

Rates of HIV and STI testing in the US have remained suboptimal for the past several decades. Research conducted thus far on the correlation between outness and HIV and STI testing has shown that among US men who have sex with men (MSM), those who have disclosed their sexuality (outness) to any healthcare provider are more likely to have received HIV and STI testing. Those studies haven't investigated the relationship between outness to a healthcare provider and the recommendation of HIV testing from that specific healthcare provider. Our study examined this correlation and whether it may differ among MSM with different backgrounds. Using data from the nationwide cross-sectional 2021 American Men's Internet Survey, Poisson multivariable regression modeling was used to assess the association between outness to a healthcare provider in the last 12 months and a recommendation of HIV testing by that same provider in the last 12 months while controlling for important covariates. Analyses also examined potential interactions between covariates and outness on recommendation of HIV testing. Overall, 77.2% (4834/6265) of men who were seen by a healthcare provider in the past 12 months were out to that provider. Among those who were out to their provider, 75.8% (3665/4834) were offered an HIV test compared to 24.6% (352/1431) of those not out to their provider. Multivariable modeling identified a significant interaction between outness and race/ethnicity. In the adjusted model, outness resulted in a greater likelihood of an HIV testing recommendation across all racial and ethnic groups. However, the effect of outness on the offering of an HIV test was strongest for white MSM (PR=3.19, CI=2.69-3.77) and weakest for black MSM (PR=1.66, CI=1.25-2.19). Based on our findings, it is imperative that healthcare providers 1) educate patients on the importance of being transparent with healthcare providers about their sexual activity and 2) be aware of the interaction between outness and race/ethnicity, as White MSM in particular have shockingly low rates of HIV testing recommendation before coming out.

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Introduction

Despite advances in prevention and treatment of HIV and other sexually transmitted infections (STIs) over the past several decades, these epidemics remain an important public health issue for American adults, especially men who have sex with men (MSM). According to the Centers for Disease Control and Prevention, in 2020, MSM comprised 68% of the new HIV diagnoses,[1] one third of gonorrhea cases, and 53% of primary and secondary syphilis cases among men.[2] This increased risk can be attributed to behavioral patterns such as longer periods of partnership acquisition and higher rates of anal sex, unprotected sex, inhaled nitrite use, concurrent partnership, and mixing between age groups.[3,4,5] The nature of the sexual networks of MSM also contributes to this disparity. Since MSM can fill both the penetrative and receptive roles in sex, it is possible for one's sexual partners to have previously been partners with each other, increasing both the likelihood of concurrence and transitivity within a sexual network.[5]

Given the concerning risk of HIV acquisition among American MSM, it is imperative to investigate effective methods of prevention. Tang et al. found that increasing STI testing from 2 to 4 times a year would prevent a median of 3 new STI exposures for every one person with an STI.[6] Numerous mathematical models have also supported increased testing as an effective means of STI prevention.[7,8,9] Therefore, the CDC recommends that MSM be tested for HIV and other STIs at least once per year and as frequently as 2-4 times a year.[10] However, rates of HIV and STI testing have remained suboptimal. In a systematic review of 32 studies, only 58% of MSM had received HIV testing in the year before enrollment.[11] One cross-sectional study found that only 42% of sampled MSM had received STI testing in the previous year,[12] and another found that only 66% of sampled MSM had received STI testing in the previous 2 years.[13]

Addressing the insufficient HIV and STI testing rates among MSM requires that one first ascertain the barriers to testing. Factors such as race/ethnicity, age, educational level, and sexual identity are correlated with disparities in testing among MSM.[11,13] Another vital factor in determining the relationship between MSM and the healthcare system in general is outness, defined in this context as informing a healthcare provider of one's attraction to or sexual activity with men. MSM are stigmatized by American society and therefore fear fully discussing their sexual behavior and health with their doctors.[14,15] This fear is founded, as homosexual behavior is also often stigmatized by healthcare professionals.[14,16,17] In fact, heterosexual doctors have been shown to hold implicit biases toward homosexual patients.[16] In an anonymous 2018 survey of American Emergency Medicine Residents, 6% of respondents believed that LGBTQ patients don't deserve the same quality of healthcare as straight patients.[18] Nonetheless, American doctors receive fewer than 10 hours of formal instruction on LGBTQ health during their medical education[19] and therefore often feel unequipped to provide necessary LGBTQ-specific care.[18] Both the biases and inadequate education of American physicians result in discriminatory care of LGBTQ patients.[17] This indicates that outness could potentially have a significant effect on testing.

Despite the biases of Americans doctors, patients who have come out to their doctors are more likely to utilize healthcare[20] and receive specific preventive care such as PrEP[20] and HBV vaccination.[21] This is most likely attributable to the fact that healthcare professionals are aware that homosexual activity is a risk factor for HIV and other STIs and that the CDC recommends increased sexual health testing and prevention services for MSM. Research conducted thus far on the correlation between outness and HIV and STI testing has shown that among American MSM,

those who have come out to their doctor are more likely to have received HIV and STI testing.[22,23,24]

Unfortunately, there are limited studies investigating the relationship between outness to a healthcare provider within the last year and the recommendation of HIV testing from that specific healthcare provider. Such studies are important because rather than simply investigating the association between general outness and HIV testing, they come closer to suggesting a causal relationship between outness to a healthcare provider and the recommendation of HIV testing from that provider. Using results from the 2021 American Men's Internet Survey (AMIS), the current study sought to examine exactly that relationship. Our objectives were 1) to determine whether outness to healthcare providers among MSM is correlated with offering of HIV testing from that provider and 2) to determine whether MSM with different backgrounds or behaviors show different correlations between outness and offering of HIV testing by the provider.

Methods

Study Population

The American Men's Internet Survey is a yearly, cross-sectional, online survey that began in 2013 to evaluate trends in HIV risk behavior, testing, and prevention.[25] The AMIS-2021 survey domains included demography, sexual behavior, substance use, preventative healthcare, stigma, and mental health. To qualify for this survey, participants had to be at least 15 years old, identify as male and have been assigned male at birth, reside in the United States, have a history of oral or anal sex with a man, and be able to complete the survey in English or Spanish. Recruitment of participants occurred through banner advertisements online and emails sent to previous AMIS participants who agreed to be contacted for future research participation.

Participants provided informed consent and were not compensated for completing the survey. All procedures performed through AMIS were approved by the Institutional Review Board of Emory University.

Measures

The primary independent variable was outness to a healthcare provider within the last 12 months. This was assessed via the question, "Did a health care provider that you saw in the past 12 months know that you are attracted to or have sex with men?" The dependent variable was the recommendation of HIV testing by a healthcare provider. This was assessed via the question, "At any of those times you were seen by a doctor or health care provider, were you offered an HIV test? An HIV test checks whether someone has the virus that causes AIDS." The response options for both these questions were "No," "Yes," "I prefer not to answer," and "Don't know."

We also analyzed data on the covariates age, race/ethnicity, sexual identity, education, household income, health insurance status, U.S. region, stigma, sexual behavior, STI testing, and drug use. We analyzed these covariates as potential confounders based on prior research.[20,22,26] We used survey response choices as categories for the covariates with the exception of questions on sexual behavior that asked participants to provide a number of sexual partners. For these questions, we used categories of 1, 2-4, and 5 or more partners in the last year. We based these categories on an assumption that healthcare providers are likely to assess increasing risk of HIV acquisition in these groupings.

Statistical Analysis

For this study, we only analyzed responses from participants who successfully completed the survey, were not duplicate surveys, had oral or anal sex with another man in the past 12 months, had seen a healthcare provider in the past 12 months, and had never received a positive

HIV diagnosis. We excluded participants who did not give yes or no responses to questions about being out to that healthcare provider or having been offered HIV testing. For multivariable Poisson regression modeling, we began with the main independent variable and all covariates from the bivariate analyses with $p<0.10$ and used backwards elimination ($p<0.10$ stay criteria) for covariate reduction. Age group and race/ethnicity were retained in the final model regardless of their significance. Using those final set of main effect covariates, we then entered all possible two-way interaction terms one at a time to identify significant interactions with outness. The model results are presented as adjusted prevalence ratios (PR) and 95% confidence intervals. Analyses were conducted using SAS 9.4. Statistical significance was determined at alpha=0.05.

Results

Of the 9,061 MSM who participated in the AMIS-2021 survey, 6,265 (69.1%) had seen a healthcare provider in the last year, were HIV-negative, and answered questions on outness to that healthcare provider and whether that healthcare provider recommended an HIV test. The most common reasons for exclusion were that participants were already HIV positive (n=1,301) or had not seen a healthcare provider in the prior year (n=1,180).

Participants included in the analysis were most commonly 40 years of age or older, White, college graduates and made $75,000 or more per year of income (Table 1). Overall, 4,834 participants (77.2%) were out to the healthcare provider they saw in the prior 12 months. Outness was more prevalent among participants who identified as homosexual or gay and had graduated from college. Outness was more prevalent among participants who had been gossiped about by a healthcare provider or mistreated at a healthcare center because of their sexual activity. Outness was less prevalent among participants who feared or avoided going to health care services for worry of someone learning that they have sex with men. Compared to

participants who identified as homosexual or gay, outness was less prevalent among participants who identified as heterosexual or straight.

Table 1. Characteristics of MSM participants by Disclosure of Sexual Activity to Healthcare Provider, American Men's Internet Survey, 2021

		Out to HCP?		
	Total Study Population	Yes	No	
	n (%)	*n (%)*	*n (%)*	*p-value*
Total Observations	6265 (100%)	4834 (77.2%)	1431 (22.8%)	
Race/Ethnicity	6181 (98.7%)	4769 (77.2%)	1412 (22.8%)	0.8425
Black, non-Hispanic	722 (11.5%)	549 (76.0%)	173 (24.0%)	
Hispanic	788 (12.6%)	593 (75.3%)	195 (24.7%)	
White, non-Hispanic	4206 (67.1%)	3258 (77.5%)	948 (22.5%)	
Other	465 (7.4%)	369 (79.4%)	96 (20.6%)	
Age	6265 (100%)	4834 (77.2%)	1431 (22.8%)	<0.0001
15-24	499 (8.0%)	311 (62.3%)	188 (37.7%)	
25-29	618 (9.9%)	488 (79.0%)	130 (21.0%)	
30-39	1517 (24.2%)	1270 (83.7%)	247 (16.3%)	
≥40	3631 (58.0%)	2765 (76.1%)	866 (23.9%)	
Sexual Identity	6220 (99.2%)	4819 (77.5%)	1401 (22.5%)	<0.0001
Homosexual or Gay	4823 (77.0%)	4081 (84.6%)	742 (15.4%)	
Heterosexual or Straight	49 (0.8%)	9 (18.4%)	40 (81.6%)	
Bisexual	1109 (17.7%)	542 (48.9%)	567 (51.1%)	
Other	239 (3.8%)	187 (78.2%)	52 (21.8%)	
Education	6254 (99.8%)	4828 (77.2%)	6254 (22.8%)	<0.0001
Never attended school	2 (0.0%)	1 (50%)	1 (50%)	
Less than high school	19 (0.3%)	9 (47.4%)	10 (52.6%)	
Some high school	65 (1.0%)	26 (40%)	39 (60%)	
High school diploma or GED	478 (7.6%)	324 (67.8%)	154 (32.2%)	
Some college, associate's degree, or technical degree	1518 (24.2%)	1130 (74.4%)	388 (25.6%)	
College, post graduate, or professional school	4172 (66.6%)	3338 (80.0%)	834 (20.0%)	
Past year total household income	5920 (94.5%)	4596 (77.6%)	1324 (22.4%)	0.1167
$0 to $19,999 annually	455 (7.3%)	335 (73.6%)	120 (26.4%)	
$20,000 to $39,999 annually	819 (13.1%)	590 (72.0%)	229 (28.0%)	
$40,000 to $74,999 annually	1354 (21.6%)	1052 (77.7%)	302 (22.3%)	
$75,000 or more annually	3292 (52.5%)	2619 (79.6%)	673 (20.4%)	
Health insurance	6178 (98.6%)	4777 (77.3%)	1401 (22.7%)	0.0843

None	269 (4.3%)	198 (73.6%)	71 (26.4%)	
Private only	4520 (72.1%)	3573 (79.0%)	947 (21.0%)	
Public only	994 (15.9%)	722 (72.6%)	272 (27.4%)	
Other/multiple	395 (6.3%)	284 (71.9%)	111 (28.1%)	
U.S. Region	6265 (100%)	4834 (77.2%)	1431 (22.8%)	0.0249
Northeast	1220 (19.5%)	949 (77.8%)	271 (22.2%)	
Midwest	1236 (19.7%)	942 (76.2%)	294 (23.8%)	
South	2330 (37.2%)	1744 (74.8%)	586 (25.2%)	
West	1467 (23.4%)	1196 (81.5%)	271 (18.5%)	
U.S. dependent areas	12 (0.2%)	3 (25%)	9 (75%)	
Male oral/anal sex partners in last 12 months	5378 (85.8%)	4262 (79.2%)	1116 (20.8%)	0.0019
1	840 (13.4%)	623 (74.2%)	217 (25.8%)	
2 to 4	1483 (23.7%)	1104 (74.4%)	379 (25.6%)	
5+	3055 (48.8%)	2535 (83.0%)	520 (17.0%)	
Unprotected Anal Sex in last 12 months	5543 (88.5%)	4403 (79.4%)	1140 (20.6%)	<0.0001
No	835 (13.3%)	556 (66.6%)	279 (33.4%)	
Yes	4708 (75.1%)	3847 (81.7%)	861 (18.3%)	
STI Test in last 12 months	6265 (100%)	4834 (77.2%)	1431 (22.8%)	<0.0001
No	3123 (49.8%)	2060 (66.0%)	1063 (34.0%)	
Yes	3142 (50.2%)	2774 (88.3%)	368 (11.7%)	
Drug use beside marijuana in last 12 months	6265 (100%)	4834 (77.2%)	1431 (22.8%)	<0.0001
No	4933 (78.7%)	3686 (74.7%)	1247 (25.3%)	
Yes	1332 (21.3%)	1148 (86.2%)	184 (13.8%)	
MSM Stigma: Experienced discrimination or gossiping from family	5257 (83.9%)	4123 (78.4%)	1134 (21.6%)	<0.0001
No	2814 (44.9%)	2054 (73.0%)	760 (27.0%)	
Yes, in the last 6 months	942 (15.0%)	760 (80.7%)	182 (19.3%)	
Yes, but not in the last 6 months	1501 (24.0%)	1309 (87.2%)	192 (12.8%)	
MSM Stigma: Afraid to go to a healthcare provider	5549 (88.6%)	4345 (78.3%)	1204 (21.7%)	<0.0001
No	4092 (65.3%)	3366 (82.3%)	726 (17.7%)	
Yes, in the last 6 months	431 (6.9%)	182 (42.2%)	249 (57.8%)	
Yes, but not in the last 6 months	1026 (16.4%)	797 (77.7%)	229 (22.3%)	
MSM Stigma: Avoided going to a healthcare provider	5582 (89.1%)	4354 (78.0%)	1228 (22.0%)	<0.0001
No	4475 (71.4%)	3622 (80.9%)	853 (19.0%)	
Yes, in the last 6 months	322 (5.1%)	131 (40.7%)	191 (59.3%)	
Yes, but not in the last 6 months	785 (12.5%)	601 (76.6%)	184 (23.4%)	

MSM Stigma: Mistreated by a healthcare provider	5504 (87.9%)	4323 (78.5%)	1181 (21.5%)	0.0003
No	4642 (74.1%)	3551 (64.5%)	1091 (23.5%)	
Yes, in the last 6 months	157 (2.5%)	129 (82.2%)	28 (17.8%)	
Yes, but not in the last 6 months	705 (11.3%)	643 (91.2%)	62 (8.8%)	
Female vaginal/anal sex partners in last 12 months	680 (10.9%)	370 (54.4%)	310 (45.6%)	0.0064
Male oral sex partners in last 12 months	688 (11.0%)	409 (59.4%)	279 (40.6%)	0.3718
Male anal sex partners in last 12 months	37 (0.6%)	26 (70.3%)	11 (29.7%)	0.7965
Injection Drug Use	227 (3.6%)	197 (%)	30 (%)	0.9929
MSM Stigma: Excluded from familiy activities	5390 (86.0%)	4245 (78.8%)	1145 (21.2%)	0.0005
MSM Stigma: Heard a healthcare provider gossip	5501 (87.8%)	4287 (77.9%)	1214 (22.0%)	0.2104

In the bivariate analyses, 75.8% of all the participants who had come out to their healthcare provider were offered HIV tests, and 24.6% of all the participants who had not come out to their healthcare providers were offered HIV tests (PR=3.08, CI=2.81-3.38; Table 2). Several other covariates were also significantly associated with increased prevalence of an HIV testing recommendation by the healthcare provider.

In the adjusted regression model, the main exposure of outness to a healthcare provider in the last 12 months was significantly associated with the recommendation of HIV testing, as were the covariates race/ethnicity, number of anal or oral sexual partners, and STI testing in the last 12 months (Table 2). We also found that there was significant interaction between race/ethnicity and outness (Chi-square=17.68, p-value=0.0005). In the adjusted model, outness resulted in a greater likelihood of an HIV testing recommendation across all racial and ethnic groups. However, the effect of outness on the offering of an HIV test was strongest for White, non-Hispanic participants (PR=3.19, CI=2.69-3.77) and weakest for Black, non-Hispanic participants (PR=1.66, CI=1.25-2.19). Among White participants, 73.7% who came out to their providers were offered HIV testing compared to 19.6% of White participants who had not come out to their providers. Among Black participants, 83.4% who came out to their providers were offered HIV testing compared to 39.3% of Black participants who had not come out to their providers.

Table 2. Characteristics of MSM participants by Healthcare Provider Recommendation of HIV Testing Within the last 12 Months, American Men's Internet Survey, 2021

		Offered an HIV Test by a Healthcare Provider in the last 12 months?							
	Total Study Population	Yes	No	Crude models			Adjusted models		
	n (%)	*n (%)*	*n (%)*	**PR**	**95% CI**	**p-value**	**PR**	**95% CI**	**p-value**
Total Observations	6265 (100%)	4017 (64.1%)	2248 (35.9%)						
Outness	6265 (100%)	4017 (64.1%)	2248 (35.9%)			<0.0001			
No	1431 (22.8%)	352 (24.6%)	1079 (75.4%)	Ref.	--	--			
Yes	4834 (77.2%)	3665 (75.8%)	1169 (24.2%)	3.0822	2.8110-3.3796	<0.0001			
Race/Ethnicity	6181 (98.7%)	3964 (64.1%)	2217 (35.9%)			0.0007			
Black, non-Hispanic	722 (11.5%)	526 (72.9%)	196 (27.1%)	1.1845	1.0785-1.3009	0.0004			
Hispanic	788 (12.6%)	518 (65.7%)	270 (34.3%)	1.0688	0.9725-1.1745	0.1672			
White, non-Hispanic	4206 (67.1%)	2587 (61.5%)	1619 (38.5%)	Ref.	--	--			
Other	465 (7.4%)	333 (71.6%)	132 (28.4%)	1.1643	1.0387-1.3050	0.009			
Outness to a Healthcare Provider in the Last 12 Months by Race/Ethnicity									0.0005
Black, non-Hispanic	722 (11.5%)	526 (72.9%)	196 (27.1%)						
No	173 (2.8%)	68 (39.3%)	105 (60.7%)	Ref.	--	--	Ref.	--	--
Yes	549 (8.8%)	458 (83.4%)	91 (16.6%)	2.1224	1.7571-2.5637	<0.0001	1.6644	1.2626-2.1940	0.0003
Hispanic	788 (12.6%)	518 (65.7%)	270 (34.3%)						
No	195 (3.1%)	64 (32.8%)	131 (67.2%)	Ref.	--	--	Ref.	--	--
Yes	593 (9.5%)	454 (76.6%)	139 (23.4%)	2.3327	1.8990-2.8654	<0.0001	2.0409	1.5166-2.7465	<0.0001
White, non-Hispanic	4206 (67.1%)	2587 (61.5%)	1619 (38.5%)						
No	948 (15.1%)	186 (19.6%)	762 (80.4%)	Ref.	--	--	Ref.	--	--
Yes	3258 (52.0%)	2401 (73.7%)	857 (26.3%)	3.7561	3.2967-4.2795	<0.0001	3.1865	2.6947-3.7679	<0.0001
Other	465 (7.4%)	333 (71.6%)	132 (28.4%)						
No	96 (1.5%)	29 (30.2%)	67 (69.8%)	Ref.	--	--	Ref.	--	--
Yes	369 (5.9%)	304 (82.4%)	65 (17.6%)	2.7272	2.0049-3.7098	<0.0001	2.4321	1.6014-3.6939	<0.0001
Age	6265 (100%)	4017 (64.1%)	2248 (35.9%)			<0.0001			0.8521
15-24	499 (8.0%)	255 (51.1%)	244 (48.9%)	0.8131	0.7144-0.9255	0.0017	0.9434	0.8222-1.0825	0.4064
25-29	618 (9.9%)	422 (68.3%)	196 (31.7%)	1.0865	0.9793-1.2054	0.1174	1.0074	0.9012-1.1260	0.8973
30-39	1517 (24.2%)	1058 (69.7%)	459 (30.3%)	1.1097	1.0317-1.1936	0.0051	1.0022	0.9267-1.0839	0.9558
≥40	3631 (58.0%)	2282 (62.8%)	1349 (37.2%)	Ref.	--	--	Ref.	--	--
Sexual Identity	6220 (99.3%)	3995 (64.2%)	2225 (35.8%)			<0.0001			

Homosexual or Gay	4823 (77.0%)	3223 (66.8%)	1600 (33.2%)	Ref.	--	--			
Heterosexual or Straight	49 (0.8%)	20 (40.8%)	29 (59.2%)	0.6109	0.3935-0.9480	0.028			
Bisexual	1109 (17.7%)	588 (53.0%)	521 (47.0%)	0.7934	0.7267-0.8663	<0.0001			
Other	239 (3.8%)	164 (68.6%)	75 (31.4%)	1.0268	0.8777-1.2013	0.7407			
Education	6254 (99.8%)	4011 (64.1%)	2243 (35.9%)			<0.0001			
Never attended school	2 (0.0%)	1 (50%)	1 (%)	0.7498	0.1056-5.3249	0.7734			
Less than high school	19 (0.3%)	9 (47.4%)	10 (52.6%)	0.7104	0.3692-1.3667	0.3057			
Some high school	65 (1.0%)	18 (27.7%)	47 (72.3%)	0.4153	0.2613-0.6601	0.0002			
High school diploma or GED	478 (7.6%)	278 (58.2%)	200 (41.8%)	0.8772	0.7710-0.9866	0.0297			
Some college, associate's degree, or technical degree	1518 (24.2%)	923 (60.8%)	595 (39.2%)	0.9118	0.8464-0.9823	0.0151			
College, post graduate, or professional school	4172 (66.6%)	2782 (66.7%)	1390 (33.3%)	Ref.	--	--			
Past year total household income	5920 (94.5%)	3817 (64.5%)	2103 (35.5%)			0.2098			
$0 to $19,999 annually	455 (7.3%)	273 (60.0%)	182 (40.0%)	0.9065	0.7993-1.0280	0.1261			
$20,000 to $39,999 annually	819 (13.1%)	500 (61.1%)	319 (38.9%)	0.9223	0.8369-1.0165	0.103			
$40,000 to $74,999 annually	1354 (21.6%)	865 (63.9%)	489 (36.1%)	0.9652	0.8921-1.0443	0.3776			
$75,000 or more annually	3292 (52.5%)	2179 (57.1%)	1113 (52.9%)	Ref.	--	--			
Health insurance	6178 (98.6%)	3974 (64.3%)	2204 (35.7%)			0.045			
None	269 (4.3%)	169 (62.8%)	100 (37.2%)	0.952	0.8153-1.1115	0.5336			
Private only	4520 (72.1%)	2983 (66.0%)	1537 (34.0%)	Ref.	--	--			
Public only	994 (15.9%)	593 (59.7%)	401 (40.3%)	0.904	0.8277-0.9872	0.0247			
Other/multiple	395 (6.3%)	229 (58.0%)	166 (42.0%)	0.8785	0.7680-1.0048	0.0588			
U.S. Region	6265 (100%)	4015 (64.1%)	2248 (35.9%)			0.0079			
Northeast	1220 (19.5%)	831 (68.1%)	389 (31.9%)	1.0841	0.9956-1.1804	0.0631			
Midwest	1236 (19.7%)	734 (59.4%)	502 (40.6%)	0.9451	0.8650-1.0327	0.2121			
South	2330 (37.2%)	1464 (62.8%)	866 (37.2%)	Ref.	--	--			
West	1467 (23.4%)	985 (67.1%)	482 (32.9%)	1.0686	0.9857-1.1585	0.1073			
U.S. dependent areas	12 (0.2%)	3 (25.0%)	9 (75.0%)	0.3979	0.1282-1.2351	0.1108			
Male oral/anal sex partners in last 12 months	5378 (85.8%)	3590 (66.8%)	1788 (33.2%)			<0.0001			<0.0001
1	840 (13.4%)	369 (43.9%)	471 (56.1%)	Ref.	--	--	Ref.	--	--

2 to 4	1483 (23.7%)	908 (61.2%)	575 (38.8%)	1.3938	1.2349-1.5731	<0.0001	1.227	1.0835-1.3895	0.0013
5+	3055 (48.8%)	2313 (75.7%)	742 (24.3%)	1.7235	1.5442-1.9237	<0.0001	1.3489	1.2012-1.5149	<0.0001
Unprotected Anal Sex in last 12 months	5543 (88.5%)	3707 (66.9%)	1836 (33.1%)			<0.0001			
No	835 (13.3%)	463 (55.4%)	372 (44.6%)	Ref.	--	--			
Yes	4708 (75.1%)	3244 (68.9%)	1464 (31.1%)	1.2427	1.1659-1.3245	<0.0001			
STI Test in last 12 months	6265 (100%)	4017 (64.1%)	2248 (35.9%)			<0.0001			<0.0001
No	3123 (49.8%)	1369 (43.8%)	1754 (56.2%)	Ref.	--	--	Ref.	--	--
Yes	3142 (50.2%)	2648 (84.3%)	494 (15.7%)	1.9226	1.8426-2.0060	<0.0001	1.4916	1.3839-1.6078	<0.0001
Drug use beside marijuana in last 12 months	6265 (100%)	4017 (64.1%)	2248 (35.9%)			<0.0001			
No	4933 (78.7%)	3011 (61.0%)	1922 (39.0%)	Ref.	--	--			
Yes	1332 (21.3%)	1006 (75.5%)	326 (24.5%)	1.2374	1.1914-1.2851	<0.0001			
MSM Stigma: Experienced discrimination or gossiping from family	5257 (83.9%)	3415 (65.0%)	1842 (35.0%)			0.0898			
No	2814 (44.9%)	1766 (62.8%)	1048 (37.2%)	Ref.	--	--			
Yes, in the last 6 months	942 (15.0%)	625 (66.3%)	317 (33.7%)	1.0572	0.9650-1.1582	0.2319			
Yes, but not in the last 6 months	1501 (24.0%)	1024 (68.2%)	477 (31.8%)	1.0871	1.0065-1.1740	0.0336			
MSM Stigma: Afraid to go to a healthcare provider	5549 (88.6%)	3608 (65.0%)	1941 (35.0%)			<0.0001			
No	4092 (65.3%)	2731 (66.7%)	1361 (33.3%)	Ref.	--	--			
Yes, in the last 6 months	431 (6.9%)	184 (42.7%)	247 (57.3%)	0.6397	0.5510-0.7427	<0.0001			
Yes, but not in the last 6 months	1026 (16.4%)	693 (67.5%)	333 (32.5%)	1.012	0.9311-1.1000	0.7783			
MSM Stigma: Avoided going to a healthcare provider	5582 (89.1%)	3627 (65.0%)	1955 (35.0%)			<0.0001			
No	4475 (71.4%)	2969 (66.3%)	1506 (33.7%)	Ref.	--	--			
Yes, in the last 6 months	322 (5.1%)	128 (39.8%)	194 (60.2%)	0.5992	0.5020-0.7151	<0.0001			
Yes, but not in the last 6 months	785 (12.5%)	530 (67.5%)	155 (32.5%)	1.0176	0.9278-1.1162	0.711			
MSM Stigma: Mistreated by a healthcare provider	5504 (87.9%)	3594 (65.3%)	1910 (34.7%)			0.0113			
No	4642 (74.1%)	2969 (64.0%)	1673 (36.0%)	Ref.	--	--			
Yes, in the last 6 months	157 (2.5%)	104 (66.2%)	53 (33.8%)	1.0357	0.8517-1.2593	0.7252			
Yes, but not in the last 6 months	705 (11.3%)	521 (73.9%)	184 (26.1%)	1.1554	1.0527-1.2682	0.0024			

Female vaginal/anal sex partners in last 12 months	680 (10.9%)	384 (56.5%)	296 (43.5%)	0.3387
Male oral sex partners in last 12 months	688 (11.0%)	292 (42.4%)	396 (57.6%)	0.1911
Male anal sex partners in last 12 months	37 (0.6%)	19 (51.4%)	18 (48.6%)	0.7662
Injection Drug Use	227 (3.6%)	147 (64.8%)	80 (35.2%)	0.8392
MSM Stigma: Excluded from familiy activities	5390 (86.0%)	3502 (65.0%)	1888 (35.0%)	0.3123
MSM Stigma: Heard a healthcare provider gossip	5501 (87.8%)	3569 (64.9%)	1932 (35.1%)	0.7348

Discussion

In this study we sought to analyze the association between outness to healthcare providers and the offering of HIV tests among various MSM. Our most notable findings were 1) only 77.2% of our study participants were out to their healthcare provider, and only 75.8% of those participants were recommended HIV testing by their healthcare provider, 2) there was a strong positive association between outness and HIV testing recommendations, and 3) while that association was present across all racial and ethnic groups, it was strongest for white MSM and weakest for black MSM.

The prevalence of outness to healthcare providers among our study participants was comparable to overall prevalence of outness found in previous studies.[20,22,24] However, our data did not show a significant difference in outness by race/ethnicity, whereas previous studies showed a significantly higher prevalence of outness to healthcare providers among White MSM compared to other racial groups, especially Black MSM.[20,22,24] This difference could be due to the fact that the AMIS-2021 survey, having been conducted online, mostly attracted participants who made $75,000 or more per year of income. Higher income level has been shown to be

positively correlated with outness to healthcare providers regardless of race/ethnicity.[22] The fact that only three quarters of our participants who were out to their healthcare providers and two thirds of total participants received HIV testing recommendations indicates that rates of outness and therefore HIV testing recommendations are woefully inadequate, as the CDC recommends that all MSM be tested for HIV at least once a year.[10]

The positive association between outness and the offering of HIV tests seen in our data is consistent with previous studies that have suggested that a general history of outness to healthcare providers is associated with increased rates of HIV and STI testing[22,23,24]. Because of the specificity of our outness and HIV testing recommendation questions, we now have data that more directly supports a causal relationship between outness to a healthcare provider and recommendation of HIV testing by that provider.

In the interaction between race/ethnicity and outness, the association between outness and the offering of HIV tests was the weakest for black MSM. This could be due to the fact that healthcare providers perceive all Black men to be at higher risk of contracting HIV.[1] They would therefore respond to this perception by recommending HIV testing to Black men who have not come out more than they would to White men who have not come out. This is consistent with both our data and CDC data showing that Black Americans receive HIV testing at higher rates than other races in the United States overall.[27] They would then respond to outness by recommending HIV testing to Black and White men at similar rates, which is also consistent with our data. This interaction indicates that outness to healthcare providers is especially important for non-Black (especially White) Americans, as they had the lowest rates of HIV testing recommendation among the study participants who were not out. However, it is worth noting that another possible explanation for the weaker effect of outness on HIV testing

recommendation among black MSM is that the healthcare providers that are more likely to see Black MSM are more likely to recommend HIV testing to all their patients regardless of sexuality.

Many of the questions regarding societal and healthcare stigma were significantly associated with the recommendation of HIV testing in the unadjusted analyses. Most notably, fear or avoidance of healthcare providers within the last 6 months was associated with decreased rates of HIV testing recommendation. However, the fact that 1) those who had actually been mistreated by healthcare providers actually were more likely to receive HIV testing recommendations and 2) none of the stigma questions were significantly associated with the recommendation of HIV testing in the adjusted model indicates that stigma alone does not affect HIV testing recommendations for MSM who actually see a healthcare provider. This is consistent with a 2021 meta-analysis that showed stigma interventions did not significantly increase HIV testing among MSM.[28] This indicates that despite the association between stigma and decreased quality of healthcare,[17] it may be prudent to consider other potential barriers to HIV testing, such as race/ethnicity, education, and income, more heavily.

This study has numerous limitations. First, the AMIS-2021 survey was conducted online. Participants in our study were most commonly white, more educated, and of a high socioeconomic status. These demographics are not representative of those most at risk of acquiring HIV.[1] Therefore, the association between outness and the offering of HIV testing found in our study is subject to selection bias and cannot be generalized to American MSM at large. Second, the AMIS-2021 survey does not ask questions about the providers that the participants saw in the prior 12 months. Because of this, our analysis does not account for various potential confounders. For example, gay and bisexual men are more likely to come out to doctors who

they perceive to be gay, younger, and female.[24] Younger female physicians have also been shown to test for HIV at higher rates than their older male counterparts.[29] Third, our data was collected from a survey with self-reported responses. Therefore, the data may be subject to misclassification due to recall bias and social desirability bias.[30] Fourth, the AMIS 2021 survey does not contain any questions that directly determined whether the HIV testing recommendations made by health care providers resulted in an actual HIV test.

Overall, the findings of this study indicate that healthcare providers should strive to create safe environments in which patients feel comfortable being transparent about their sexual activity. Doctors receive little education on LGBTQ health,[19] so it is important that moving forward, medical curricula incorporate an emphasis on outness as a factor in HIV testing recommendation rates. It is also important that health educators inform future healthcare providers of the effect of the interaction between race/ehtnicity and outness on HIV testing recommendations. This will alert future healthcare providers to the shockingly low rates of HIV testing among White MSM and inform their practice. Subsequent steps to further this study include expanding this survey to include questions about the healthcare providers seen by AMIS participants, as knowledge and action from both patients and healthcare providers are required to achieve adequate HIV testing rates. Such a survey expansion would facilitate investigation into factors pertaining to healthcare providers' discussion of sexuality with their patients and HIV testing recommendation rates. This would further inform the development of medical LGBTQ curricula.

The United States will never truly be able to tackle the decades-long HIV epidemic until it adequately prioritizes prevention efforts, and our data show that outness to healthcare providers is an integral aspect of HIV prevention. In order to achieve this, it is imperative that

healthcare providers and everyone who works in public health educate patients on the risk factors associated with HIV transmission and the importance of being transparent with healthcare providers about their sexual activity.

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