Lack of HIV testing and dissatisfaction with HIV testing and counselling among men having sex with men in Hungary

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Short title: HIV testing among MSM in Hungary

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Abstract

Background: Using data from a large internet-based survey of European men having sex with men (MSM), we assessed factors associated with HIV testing and reasons for dissatisfaction with HIV testing and counselling among Hungarian MSM.

Methods: A total of 2,052 Hungarian MSM provided evaluable data for the European MSM Internet Survey (EMIS) in 2010. Chi square tests and Poisson regression with a robust variance estimator were used to assess factors associated with HIV testing and dissatisfaction with HIV testing and counselling.

Results: A total of 42.1% of MSM reported never being testing for HIV. Over one-half of men (54.1%) who reported condomless anal intercourse (CAI) in the prior 12 months with a person of unknown or sero-discordant HIV status reported no lifetime HIV testing. The factor most strongly associated with dissatisfaction with HIV testing and counselling was test site with increased dissatisfaction with inpatient hospital settings vs. community-based organizations. Both lack of HIV testing and dissatisfaction with testing were independently associated with MSM who reported that no one, or only a few people, knew they were attracted to men.

Conclusions: Lack of HIV testing was strongly associated with CAI. MSM reported that community-based organizations better supported confidentiality and were more respectful during HIV testing.

Keywords: HIV testing; Europe; Hungary; men who have sex with men; counselling; homophobia; homonegativity; stigma

Introduction

Targeting populations at highest risk for HIV infection for early detection of HIV through testing and counselling activities remains a corner stone of the public health response to HIV.[1, 2] HIV testing is important for a number of reasons including that inadequate counselling and testing activities may lead to increased transmission;[3] however, HIV testing rates remain suboptimal throughout Europe although rates are heterogeneous by country[4] with particularly low rates in some eastern and central European countries.[5, 6] These suboptimal testing rates occur in the wake of increasing HIV and sexually transmitted infection (STI) incidence in a time of increased political, economic and social instability in the region.[7]

In Hungary, where unprotected sex between men is the main risk factor for HIV infection,[8] 42% of gay, bisexual and other men who have sex with men (MSM) report never having tested for HIV.[4] This proportion is high compared to Western European countries but comparable to other Central-Eastern European countries.[4] Reasons for lack of HIV and STI testing and treatment may include a lack of public resources,[9] age, sexual identity,[4] and stigmatization.[10-12] While a qualitative study explored provision of HIV services among 27 MSM in Budapest,[13] factors associated with a lack of testing and reasons for dissatisfaction with HIV testing and counselling in Hungary have not been reported to our knowledge.

The European MSM Internet Survey[14, 15] collected evaluable data from 174,209 MSM in 2010, including data regarding demographics, sexual behaviour, and HIV testing.[4] Of these, 2067 men were living in Hungary and prior EMIS publications had not focused on these men. Our objective was to assess HIV testing behaviours and reasons for dissatisfaction with HIV testing among Hungarian MSM.

Methods

Recruitment

A detailed description of the EMIS methodology has been previously published.[4, 14] In brief, a total of 174,209 MSM recruited in 38 European countries met the inclusion criteria. Among inclusion criteria were men living in Europe who were at least the age of consent in their country of residence, and men with an attraction to men or a history of sex with men. The data were collected between June and August 2010.

Hungarian men were primarily recruited through gay social media (e.g., 65% PlanetRomeo). No incentive was provided for survey completion. All men completed an informed consent statement before the survey, and all EMIS procedures were approved by the Research Ethics Committee of the University of Portsmouth, UK.

Measures

The current analysis assessed survey data from Hungarian MSM dealing with demographics, sexual identity, sexual behaviour, HIV and STI testing behaviour, satisfaction with HIV test counselling, HIV/STI knowledge, and substance use behaviour. Age was categorised using five-year increments through age 44. Ages 45-76 years were collapsed into one category due to sparse data. Country of birth and place of residence were dichotomized (i.e., Hungary or not, and Budapest or rest of Hungary, respectively).

Relationship status asked men about a “steady relationship” with a man or woman with reference to husband/wife or boyfriend/girlfriend to distinguish these relationships from casual or non-steady regular sex partners.

The place of the last HIV test was asked using the following options: “At an HIV testing service (that is, not in a hospital or clinic),” “In a bar/pub, club or sauna,” or “Mobile medical unit” (categorised as “community-based organisation”); “General Practitioner/family doctor,” or “A doctor in private practice” (both categorised as “physician’s office”); “At a hospital or clinic as an out-patient” (categorized as “outpatient clinic/hospital”); “At a hospital as an in-patient” (categorised as “inpatient clinic/hospital”); or “At a blood bank, while donating blood,” “I used a home testing kit,” or “Elsewhere” (all categorised as “other”). For creation of figure 1, the outpatient and inpatient clinic/hospital categories were combined as “Hospital or clinic.”

Men were asked to describe themselves as “gay or homosexual,” “bisexual,” “straight or heterosexual,” “any other term,” or “I don’t usually use a term.” To assess factors associated with dissatisfaction with HIV counselling and testing, “straight or heterosexual,” and “any other term,” were combined due to sparse data. Men’s openness about their sexual identity was measured by asking men to report how many people knew about their identity, i.e., only a few or none, or more than a few.

Risk for HIV transmission was dichotomized by asking men if there had or had not been condomless anal intercourse with a person in the last 12 months whom they perceived as HIV discordant or HIV status unknown.

Knowledge of HIV, STIs, and post-exposure prophylaxis was assessed by presenting men with true statements about these topics and then asking men to acknowledge if they already knew or did not know the information. Knowledge variables were categorized as "0-50% correct," "51-75% correct," and "76-100% correct." Substance use was assessed by dichotomous variables asking about use (no/yes) of a particular substance in a specified time period.

Analytical methods

Survey measures were stratified by HIV test result and lack of HIV testing with differences assessed by chi square tests. Differences by test site regarding reasons for dissatisfaction with HIV testing and counselling were assessed with chi square tests.

In order to determine factors associated with never getting an HIV test and factors associated with dissatisfaction with HIV testing and counselling, we undertook two rounds of modelling using Poisson regression with a robust variance estimator to estimate

prevalence ratios.[16] Factors chosen for multivariable analysis in each round were significant in univariable analysis ($p<0.20$). In addition, known confounders (i.e., age,[17] birth country, and residence) were retained in all multivariable analyses.[18] For each multivariable analyses, variables were removed one-by-one until only statistically significant variables remained. A variable was considered statistically significant if the 95% CIs for any of its prevalence ratios excluded unity.

Directed acyclic graphs (DAGs),[19] indicated that no variables significant in univariable analysis should be excluded from modelling factors associated with non-HIV testing.[18] In addition to confounders, factors included in multivariable analysis for the outcome of non-HIV testers were relationship status, sexual identity, openness about sexual identity, sexual happiness, 12-month HIV transmission risk, access to free or affordable HIV testing, knowledge about HIV, STIs, and post-exposure prophylaxis, use of nitrate inhalants in the last four weeks, use of benzodiazepines in the last 12 months, use of cannabis in the last 12 months, and use of party-n-play drugs in the last 12 months.

The outcome of dissatisfaction with HIV testing and counselling was created from four variables: Dissatisfaction with or lack of counselling when testing for HIV, dissatisfaction with confidentiality when testing, dissatisfaction with respect when testing, and ability to talk about sexual behaviour when testing for HIV. In addition to confounders, factors

included in multivariable analysis for the outcome of dissatisfaction with HIV testing and counselling were relationship status, sexual identity, openness about sexual identity, sexual happiness, test site, knowledge about HIV, STIs, and post-exposure prophylaxis, and use of nitrate inhalants in the last four weeks. DAGs[19] indicated that access to free/affordable HIV testing and self-reported STI testing in the last 12 months, while significant in univariable analysis, may be intermediate variables to exclude from modelling;[18] however, since multivariable modelling with these variables did not substantively change final model prevalence ratios, they were not excluded. Data were analysed using SAS 9.4 (SAS Institute Inc., Cary, North Carolina, USA).

Results

Of all MSM in Hungary providing evaluable surveys, 2052 provided data on HIV testing history (table 1). Their median age was 28 years (range, 15-76 years), 56.1% resided in Budapest, and 8.7% of men reported being born in another country.

While 45.1% said that no one, or only a few people, knew they were attracted to men, a majority identified as gay (72.2%) and 14.3% identified as bisexual. Four out of ten men (41.5%) reported anti-gay violence or intimidation in the prior year. Less than one-half of men (40.3%) reported being in a relationship with another man while more than a quarter of men (28.5%) reported condomless anal intercourse (CAI) in the prior year with another man of unknown or discordant HIV status.

A total of 42.1% of all men reported never being tested for HIV. About 55% of men reported their last HIV test was negative and 3.2% reported the last HIV test was positive. A plurality of men testing negative (44.3%) had the test at a community-based organization while another 33.5% were tested in a hospital. Approximately 43% of both HIV-positive and HIV-negative men reported either no counselling or dissatisfaction with HIV counselling. Most men who had never tested for HIV also reported no STI testing in the prior 12 months (table 1). A majority of foreign-born men never reporting an HIV test were from Romania, Serbia, and Germany (data not shown).

In multivariable analysis to assess factors associated with non-HIV testers, a number of demographic, sexual behaviour, health care, knowledge, and substance use variables were associated with HIV testing (table 2). For example, men never testing were more likely to live outside of Budapest (aPR 1.50, 95% CI 1.34-1.67), to say that few people or no one knew they were attracted to men (aPR 1.52, 95% CI 1.36-1.71, compared to men who said that more than a few persons knew), to have had CAI with a man of unknown or discordant HIV status in the last year (aPR 1.75, 95% CI 1.58-1.93, compared to men with no CAI risk), and to report no access to free or affordable HIV testing (aPR 1.54, 95% CI 1.41-1.70, compared to HIV-negative men who reported access to free or affordable HIV testing).

Among men who had ever had an HIV test and after adjustment for age, birthplace, and residence, men were more likely to be dissatisfied with HIV-test counselling (or to have never received counselling during HIV testing) if they reported that few people or no one knew they were attracted to men (aPR 1.09, 95% CI 1.02-1.15, compared to men who said that more than a few persons knew). In addition, men who reported they were sexually happy had less dissatisfaction with HIV testing and counselling while men who had no STI testing in the prior 12 months had increased dissatisfaction (table 3).

Men also reported dissatisfaction if they had HIV testing in places other than a community-based organization or a physician's office. For example, men getting an HIV test in an inpatient hospital setting were 31% more likely to voice dissatisfaction with HIV testing and counselling compared to men testing in a community-based organization (aPR 1.32, 95% CI 1.16-1.50) (table 3). Men testing in community-based organizations compared with hospitals generally reported less dissatisfaction with test confidentiality ($p=0.05$), respect ($p=0.02$), counselling ($p<0.0001$), and the opportunity to disclose sexual behaviour with men ($p<0.0001$) (figure 1).

Discussion

In a large internet-based sample of Hungarian MSM, dissatisfaction with HIV testing and counselling was very common regardless of the kind of test site; however, men had increased dissatisfaction with hospitals and "other" test sites compared to community-based organizations. In addition, in contrast to an analysis of EMIS data in the Netherlands which found that less CAI was associated with less HIV testing,[20] MSM in Hungary with higher levels of CAI were less likely to have ever had HIV testing. A negative association between MSM HIV risk behaviours and testing was also observed in Portuguese EMIS data.[21]

Stigmatization of homosexuality and internalized homonegativity are associated with decreased HIV testing[22, 23] and MSM in Hungary may be exposed to increased amounts of stigmatization compared with MSM in some other European countries.[12] Indeed, Hungarian MSM who reported no HIV test were 52% more likely to say that no one, or only a few people, knew they were attracted men. Closeted men were also more likely to be dissatisfied with HIV testing and counselling. It is possible that a stigmatizing experience with testing may induce men to remain closeted.[23] It is also possible that closeted men are more likely to avoid HIV testing.[22] In both cases, HIV testing that preserves confidentiality and is respectful of MSM may reduce barriers to initial and repeated HIV testing.

While recent HIV and STI epidemic trends in Europe indicate increased HIV and STI risk for younger MSM,[4] Hungarian MSM under the age of 30 were less likely to have had an HIV test than any other age group. While increased age generally leads to increased opportunity to test, it is notable that just over 80% of MSM aged 15-19 years, and one-half of MSM aged 20-24 years reported never testing for HIV.

Almost 60% of MSM who did not report an HIV test lived outside of Budapest. Compared to men in Budapest, more than double the proportion of men outside of Budapest reported no access to free and affordable HIV testing ($p<0.0001$) (data not shown). Given that more than one in five HIV-positive Hungarian men in this sample lived outside of Budapest, free and/or affordable testing for MSM in smaller cities and towns in Hungary may enhance detection of HIV infection, especially if this HIV testing is perceived as confidential and respectful of the men.

Sexual happiness was associated with decreased HIV test dissatisfaction (i.e., sexual happiness was associated with increased satisfaction in HIV-test counselling) while lack of recent STI testing was associated with increased dissatisfaction. It is plausible that HIV testing including appropriate sexual health counselling would support sexual happiness. It is also possible that stigma-related dissatisfaction with HIV testing and counselling could inhibit subsequent STI testing;[22] however, the current cross-sectional study design

generally precludes such conclusions. It is worth noting that Budapest has limited access to STI testing for MSM in comparison to many other European cities.[24]

In addition to the limitations of recall bias and social desirability bias, MSM without internet access were excluded from taking the survey which could also introduce selection bias since household internet access in 2009 in Hungary was only approximately 50%.[25] In general, internet samples of MSM, when compared with convenience samples, may be more bisexually-identified, younger, and more representative of MSM outside of urban centres.[26] Indeed, almost 1/3 of the men in the current study resided outside of Budapest. However, the anonymity of the survey may have reduced social desirability bias and the internet-based platform may have increased the diversity of the men[26] leading to a more representative sample.[27, 28] In addition, while 36% of Hungarians live outside of Budapest, over 43% of men in our sample reported living outside of Budapest providing important data about MSM health in areas in Eastern Europe outside of a large metropolitan area. EMIS data for all 38 European countries found HIV-positive men were less satisfied with confidentiality and respect during HIV testing and counselling, while HIV-negative men had less opportunity to talk about sex.[4] Our sample only had 65 men who reported HIV infection precluding us from making generalizations about dissatisfaction stratified by HIV status. The EMIS data lacked a socioeconomic measure which prevented us from assessing an association between income and lack of HIV testing and dissatisfaction with

HIV testing and counselling. Finally, the data were collected in 2010 and it is possible that men's responses to questions about HIV testing and counselling satisfaction may have changed in the interim.

Men who were closeted were less likely to test and more likely to be dissatisfied with the counselling if they had ever had an HIV test. Given the high proportion of men having CAI with discordant or unknown HIV status partners, the limited HIV testing, and the limited basic knowledge about HIV, STIs, and post-exposure prophylaxis (PEP) among men who had not been tested, a substantial portion of Hungarian MSM are likely at high risk for HIV infection. Detecting that infection, and preventing future infection, is hampered by limited HIV counselling and sexual health instruction as reported by a high proportion of Hungarian MSM who have had HIV testing. Such disease prevention counselling should be implemented in test sites in order to educate men on methods of HIV and STI prevention. Indeed, successful HIV interventions in Hungary are possible even in the face of significant stigma surrounding same-sex behaviour.[29] In this analysis, men reported that community-based organizations better supported confidentiality and provided more respect during HIV testing. Given that Hungarian MSM were also more likely to attend community-based organizations for HIV testing, organizations that are culturally competent with MSM should be supported in order to increase access to HIV testing.

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Conflicts of interests

The authors declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.

Key Points

1) HIV testing among the population at highest risk for HIV in Hungary, men who have sex with men (MSM), remains suboptimal.
2) Dissatisfaction with HIV testing was highest among those testing in an inpatient hospital and lowest in those testing at a community-based organization.
3) Being closeted was strongly associated with lack of HIV testing and dissatisfaction with testing.
4) Community-based organizations that are culturally competent with MSM should be supported in Hungary to increase HIV testing and prevention.

Contributions

AGN conducted primary analysis and writing of the manuscript; MWR, FB, and AJS contributed to analysis design and manuscript review; AJS also contributed to data analysis.

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Table 1. Selected characteristics of Hungarian MSM stratified by HIV diagnosis and testing history[a].

	n (%)			
Variable	Last HIV test negative n=1124	Last HIV test positive n=65	Never tested n=863	Total n=2052
Age, years[b]				
15-19	37 (3.3)	0 (0.0)	153 (17.7)	190 (9.3)
20-24	234 (20.8)	6 (9.2)	238 (27.6)	478 (23.3)
25-29	296 (26.3)	11 (16.9)	189 (21.9)	496 (24.2)
30-34	272 (24.2)	9 (13.9)	137 (15.9)	418 (20.4)
35-39	132 (11.7)	14 (21.5)	60 (7.0)	206 (10.0)
40-44	76 (6.8)	16 (24.6)	38 (4.4)	130 (6.3)
45-76	77 (6.9)	9 (13.9)	48 (5.6)	134 (6.5)
Median, range	29, 16-68	37, 23-68	25, 15-76	28, 15-76
Residence[b]				
Budapest	752 (66.9)	49 (75.4)	350 (40.6)	1151 (56.1)
Rest of Hungary	360 (32.0)	14 (21.5)	507 (58.8)	881 (42.9)
Missing	12 (1.1)	2 (3.1)	6 (0.7)	20 (1.0)
Born in Hungary[b]				
No	124 (11.0)	12 (18.5)	43 (5.0)	179 (8.7)
Yes	974 (86.7)	52 (80.0)	807 (93.5)	1833 (89.3)
Missing	26 (2.3)	1 (1.5)	13 (1.5)	40 (2.0)

Relationship status[b]								
Single	534	(47.5)	29	(44.6)	494	(57.2)	1057	(51.5)
Steady relationship with men	526	(46.8)	35	(53.9)	265	(30.7)	826	(40.3)
Steady relationship with women only	53	(4.7)	1	(1.5)	93	(10.8)	147	(7.2)
Missing	4	(0.4)	0	(0.0)	6	(0.7)	10	(0.5)
How do you think of yourself?								
Gay or homosexual	902	(80.3)	61	(93.9)	518	(60.0)	1481	(72.2)
Bisexual	107	(9.5)	1	(1.5)	185	(21.4)	293	(14.3)
Straight or heterosexual	7	(0.6)	0	(0.0)	22	(2.6)	29	(1.4)
Any other term	6	(0.5)	0	(0.0)	13	(1.5)	19	(0.9)
I don’t usually use a term	101	(9.0)	3	(4.6)	124	(14.4)	228	(11.1)
Missing	1	(0.1)	0	(0.0)	1	(0.1)	2	(0.1)
Outness: Of all the people you know, what proportion know you are attracted to men?[b]								
More than a few	759	(67.5)	55	(84.6)	300	(34.8)	1114	(54.3)
A few or none	360	(32.0)	10	(15.4)	556	(64.4)	926	(45.1)
Missing	5	(0.4)	0	(0.0)	7	(0.8)	12	(0.6)
Experience with anti-gay violence or intimidation in the last 12 months								
No violence	670	(59.6)	36	(55.4)	484	(56.1)	1190	(58.0)
Experience with violence or intimidation	449	(40.0)	29	(44.6)	374	(43.3)	852	(41.5)
Missing	5	(0.4)	0	(0.0)	5	(0.6)	10	(0.5)
Sexual happiness[b]								
No	469	(41.7)	24	(36.9)	485	(56.2)	978	(47.7)

Yes	596	(53.0)	32	(49.2)	333	(38.6)	961	(46.8)
Missing	59	(5.3)	9	(13.9)	45	(5.2)	113	(5.5)
12-month HIV transmission risk[b]								
No CAI with HIV-unknown/discordant man	849	(75.5)	28	(43.1)	474	(54.9)	1351	(65.8)
CAI with HIV-unknown/discordant man	232	(20.6)	36	(55.4)	316	(36.6)	584	(28.5)
Missing	43	(3.8)	1	(1.5)	73	(8.5)	117	(5.7)
Location of last HIV test/HIV diagnosis[b]								
Community-based organization	498	(44.3)	21	(32.3)	0	(0.0)	519	(25.3)
Physician's office	119	(10.6)	5	(7.7)	0	(0.0)	124	(6.0)
Outpatient clinic/hospital	363	(32.3)	29	(44.6)	0	(0.0)	392	(19.1)
Inpatient clinic/hospital	13	(1.2)	5	(7.7)	0	(0.0)	18	(0.9)
Other	128	(11.4)	3	(4.6)	0	(0.0)	131	(6.4)
Missing/Never tested	3	(0.3)	2	(3.1)	863	(100.0)	868	(42.3)
Dissatisfaction with or lack of counselling when testing for HIV (HIV testers only)								
Satisfied	518	(46.1)	31	(47.7)	0	(0.0)	549	(26.8)
Dissatisfied or no counselling	488	(43.4)	28	(43.1)	0	(0.0)	516	(25.2)
Never tested	0	(0.0)	0	(0.0)	863	(100.0)	863	(42.1)
Missing	118	(10.5)	6	(9.2)	0	(0.0)	124	(6.0)
Dissatisfaction with confidentiality when testing for HIV (HIV testers only)[b]								
Satisfied	991	(88.2)	44	(67.7)	0	(0.0)	1035	(50.4)
Dissatisfied	61	(5.4)	14	(21.5)	0	(0.0)	75	(3.7)
Never tested	0	(0.0)	0	(0.0)	863	(100.0)	863	(42.1)

Missing	72	(6.4)	7	(10.8)	0	(0.0)	79	(3.9)
Dissatisfaction with respect when testing for HIV (HIV testers only)[b]								
Satisfied	1019	(90.7)	43	(66.2)	0	(0.0)	1062	(51.8)
Dissatisfied	69	(6.1)	17	(26.2)	0	(0.0)	86	(4.2)
Never tested	0	(0.0)	0	(0.0)	863	(100.0)	863	(42.1)
Missing	36	(3.2)	5	(7.7)	0	(0.0)	41	(2.0)
Ability to talk about sexual behaviour when testing for HIV (HIV testers only)[b]								
No	712	(63.4)	25	(38.5)	0	(0.0)	737	(35.9)
Yes	324	(28.8)	23	(35.4)	0	(0.0)	347	(16.9)
I don't remember	86	(7.7)	15	(23.1)	0	(0.0)	101	(4.9)
Never tested	0	(0.0)	0	(0.0)	863	(100.0)	863	(42.1)
Missing	2	(0.2)	2	(3.1)	0	(0.0)	4	(0.2)
Access to free or affordable STI testing[b]								
No	260	(23.1)	6	(9.2)	379	(43.9)	645	(31.4)
Yes	860	(76.5)	58	(89.2)	480	(55.6)	1398	(68.1)
Missing	4	(0.4)	1	(1.5)	4	(0.5)	9	(0.4)
Access to free or affordable HIV testing (HIV negative or untested only)[b]								
No	41	(3.7)	0	(0.0)	227	(26.3)	268	(13.1)
Yes	1077	(95.8)	0	(0.0)	636	(73.7)	1713	(83.5)
Missing	6	(0.5)	65	(100.0)	0	(0.0)	71	(3.5)
Overall scores on basic knowledge about HIV, STIs, and post-exposure prophylaxis[b]								
0-50% correct	120	(10.7)	3	(4.6)	232	(26.9)	355	(17.3)

51-75% correct	650	(57.8)	17	(26.2)	468	(54.2)	1135	(55.5)
76-100% correct	354	(31.5)	45	(69.2)	163	(18.9)	562	(27.4)
Missing	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
STI testing in the prior 12 months[b]								
No STI test	668	(59.4)	21	(32.3)	813	(94.2)	1502	(73.2)
STI tested	415	(36.9)	43	(66.2)	23	(2.7)	481	(23.4)
Missing	41	(3.7)	1	(1.5)	27	(3.1)	69	(3.4)
Self-reported syphilis in last 12 months among those with a blood test								
Negative	368	(32.7)	28	(43.1)	12	(1.4)	408	(19.9)
Positive	21	(1.9)	12	(18.5)	2	(0.2)	35	(1.7)
No blood test in 12 months	690	(61.4)	24	(36.9)	822	(95.3)	1536	(74.9)
Missing	45	(4.0)	1	(1.5)	27	(3.1)	73	(3.6)
Self-reported anogenital warts in last 12 months among those with a penile/anal inspection[b]								
No	85	(7.6)	11	(16.9)	6	(0.7)	102	(5.0)
Yes	7	(0.6)	4	(6.2)	0	(0.0)	11	(0.5)
No penile/anal inspection in 12 months	991	(88.2)	49	(75.4)	830	(96.2)	1870	(91.1)
Missing	41	(3.7)	1	(1.5)	27	(3.1)	69	(3.4)
Hepatitis B vaccine needs[b]								
Immune or already vaccinated	373	(33.2)	23	(35.4)	253	(29.3)	649	(31.6)
Not immune and not fully vaccinated	583	(51.9)	37	(56.9)	389	(45.1)	1009	(49.2)
I don’t know/Missing	168	(15.0)	5	(7.7)	221	(25.6)	394	(19.2)
Use of nitrate inhalants in the last 4 weeks[b]								

No	930	(82.7)	30	(46.2)	798	(92.5)	1758	(85.7)
Yes	184	(16.4)	35	(53.9)	59	(6.8)	278	(13.6)
Missing	10	(0.9)	0	(0.0)	6	(0.7)	16	(0.8)
Use of benzodiazepines in the last 12 months[b]								
No	919	(81.8)	48	(73.9)	759	(88.0)	1726	(84.1)
Yes	196	(17.4)	14	(21.5)	98	(11.4)	308	15.0
Missing	9	(0.8)	3	(4.6)	6	(0.7)	18	(0.9)
Use of cannabis in the last 12 months[b]								
No	882	(78.5)	47	(72.3)	739	(85.6)	1668	(81.3)
Yes	231	(20.6)	18	(27.7)	119	(13.8)	368	(17.9)
Missing	11	(1.0)	0	(0.0)	5	(0.6)	16	(0.8)
Use of party-n-play drugs in the last 12 months[b,c]								
No	977	(86.9)	46	(70.8)	796	(92.2)	1819	(88.7)
Yes	136	(12.1)	19	(29.2)	62	(7.2)	217	(10.6)
Missing	11	(1.0)	0	(0.0)	5	(0.6)	16	(0.8)

[a]The EMIS Network. EMIS 2010: The European Men-Who-Have-Sex-With-Men Internet Survey.

[b]Chi square p value <0.001; Hypothesis test does not include missing observations.

[c]That is, Ecstasy/MDMA, amphetamines, crystal methamphetamine, mephedrone, GHB/GBL, ketamine, or cocaine.

Note: MSM, men having sex with men; CAI, condomless anal intercourse; STI, sexually transmitted infection.

Table 2. Factors associated with never testing for HIV among 2052 MSM in Hungary[a].

Variable		Univariable			Multivariable	
	n	%NT[c]	PR	(95% CI)	aPR	(95% CI)
Age, years						
15-19	190	.81	2.25	(1.77 -2.85)	-	
20-24	478	.50	1.39	(1.09 -1.77)	-	
25-29	496	.38	1.06	(0.83 -1.37)	-	
30-34	418	.33	0.92	(0.70 -1.19)	-	
35-39	206	.29	0.81	(0.60 -1.11)	-	
40-44	130	.29	0.82	(0.57 -1.16)	-	
45-76	134	.36	1.0		-	
Birthplace						
In Hungary	1816	.44	1.83	(1.41 -2.39)	**1.34**	**(1.05 -1.73)**
Outside of Hungary	177	.24	1.0		1.0	
Residence						
Budapest	1151	.30	1.0		1.0	
Rest of Hungary	881	.58	1.89	(1.71 -2.10)	**1.50**	**(1.34 -1.67)**
Relationship status						
Single	1057	.47	1.0		1.0	
Steady relationship with men	838	.32	0.69	(0.61 -0.78)	**0.85**	**(0.75 -0.95)**
Steady relationship with women only	147	.63	1.35	(1.18 -1.56)	1.17	(0.95 -1.44)
How do you think of yourself?						

Gay or homosexual	1481	.35	1.0	1.0
Bisexual	293	.63	1.81 (1.61 -2.02)	**1.33 (1.17 -1.52)**
Straight or heterosexual	29	.76	2.17 (1.75 -2.69)	1.10 (0.67 -1.79)
Any other term	19	.68	1.96 (1.43 -2.68)	1.40 (0.85 -2.30)
I don't usually use a term	228	.54	1.55 (1.35 -1.78)	1.14 (0.99 -1.31)
Of all the people you know, what proportion know you are attracted to men?				
More than a few	1114	.27	1.0	1.0
A few or none	926	.60	2.23 (2.00 -2.49)	**1.52 (1.36 -1.71)**
Sexual happiness				
No	978	.50	1.0	1.0
Yes	961	.35	0.70 (0.63 -0.78)	**0.82 (0.73 -0.92)**
12-month HIV transmission risk				
No CAI with HIV-unknown/discordant man	1351	.35	1.0	1.0
CAI with HIV-unknown/discordant man	584	.54	1.54 (1.39 -1.71)	**1.75 (1.58 -1.93)**
Access to free or affordable HIV testing (HIV negative or untested only)				
No	268	.84	2.28 (2.11 -2.47)	**1.54 (1.41 -1.70)**
Yes	1713	.37	1.0	1.0
Overall scores on basic knowledge about HIV, STIs, and post-exposure prophylaxis				
0-50% correct	355	.65	2.25 (1.94 -2.62)	**1.35 (1.16 -1.57)**
51-75% correct	1135	.41	1.42 (1.23 -1.65)	**1.17 (1.02 -1.35)**
76-100% correct	562	.29	1.0	1.0
Use of nitrate inhalants in the last 4 weeks				

No	1758	.45	1.0	1.0
Yes	278	.79	0.47 (0.37 -0.59)	**0.72 (0.57 -0.90)**
Use of benzodiazepines in the last 12 months				
No	1726	.56	1.0	1.0
Yes	308	.68	0.72 (0.61 -0.86)	**0.81 (0.68 -0.94)**
Use of cannabis in the last 12 months				
No	1668	.56	1.0	1.0
Yes	368	.68	0.73 (0.62 -0.85)	**0.80 (0.68 -0.94)**

[a]The EMIS Network. EMIS 2010: The European Men-Who-Have-Sex-With-Men Internet Survey.

[b]All variables adjusted for each other and by age.

[c]Proportion reporting never testing for HIV.

Note. MSM, men having sex with men; PR, prevalence ratio; aPR, adjusted prevalence ratio; CAI, condomless anal intercourse; STI, sexually transmitted infection.

Table 3. Factors associated with dissatisfaction with HIV testing and counselling among 1154 MSM testing for HIV in Hungary[a].

		Univariable		Multivariable[b]
Variable	n	%Dis[c]	PR (95% CI)	aPR (95% CI)
Age, years				
15-19	36	.89	1.17 (0.99 -1.38)	-
20-24	235	.79	1.04 (0.90 -1.19)	-
25–29	294	.80	1.06 (0.93 -1.21)	-
30-34	272	.81	1.07 (0.93 -1.22)	-
35-39	144	.79	1.03 (0.89 -1.20)	-
40-44	90	.83	1.10 (0.94 -1.28)	-
45-76	83	.76	1.0	-
Birthplace				
In Hungary	999	.80	1.05 (0.95 -1.16)	-
Outside of Hungary	128	.77	1.0	-
Residence				
Budapest	777	.78	1.0	-
Rest of Hungary	365	.84	**1.08 (1.02 -1.14)**	-
Relationship status				
Single	548	.82	1.0	-
Steady relationship with men	550	.77	0.94 (0.89 -1.00)	-
Steady relationship with women only	52	.92	**1.13 (1.03 -1.23)**	-

How do you think of yourself?				
Gay or homosexual	935	.79	1.0	-
Bisexual	104	.87	**1.09 (1.01 -1.19)**	-
Any other term	13	.84	1.07 (0.85 -1.35)	-
I don't usually use a term	101	.82	1.04 (0.94 -1.15)	-
Of all the people you know, what proportion know you are attracted to men?				
More than a few	789	.77	1.0	1.0
A few or none	360	.86	**1.11 (1.05 -1.17)**	**1.09 (1.02 -1.15)**
Sexual happiness				
No	478	.83	1.0	1.0
Yes	611	.78	**0.94 (0.88 -0.99)**	**0.94 (0.88 -0.99)**
Location of last HIV test/HIV diagnosis				
Community-based organization	505	.72	1.0	1.0
Physician's office	120	.78	1.07 (0.96 -1.20)	1.10 (0.98 -1.23)
Outpatient clinic/hospital	380	.85	**1.18 (1.10 -1.26)**	**1.16 (1.08 -1.25)**
Inpatient clinic/hospital	18	.94	**1.31 (1.16 -1.48)**	**1.32 (1.16 -1.50)**
Other	130	.97	**1.34 (1.26 -1.43)**	**1.30 (1.22 -1.39)**
Self-reported STI testing in the prior 12 months				
No STI test	669	.85	**1.15 (1.08 -1.23)**	**1.15 (1.07 -1.23)**
STI tested	445	.74	1.0	1.0
Self-reported syphilis result in last 12 months among those with a blood test				
Negative	384	.75	1.0	-

Positive	33	.67	0.89 (0.69 -1.14)	-
No blood test in 12 months	693	.84	**1.12 (1.04 -1.19)**	

[a] The EMIS Network. EMIS 2010: The European Men-Who-Have-Sex-With-Men Internet Survey. Variable "Dissatisfaction with HIV testing" created from 4 variables in table 1: dissatisfaction with confidentiality when testing, dissatisfaction with respect when testing, lack of counselling or dissatisfaction with counselling when testing, and able to talk about sexual behaviour when testing for HIV.

[b] All variables adjusted for each other and by age, birthplace, and residence.

[c] Proportion dissatisfied with HIV testing and counselling.

Note. MSM, men having sex with men; PR, prevalence ratio; aPR, adjusted prevalence ratio; STI, sexually transmitted infection.

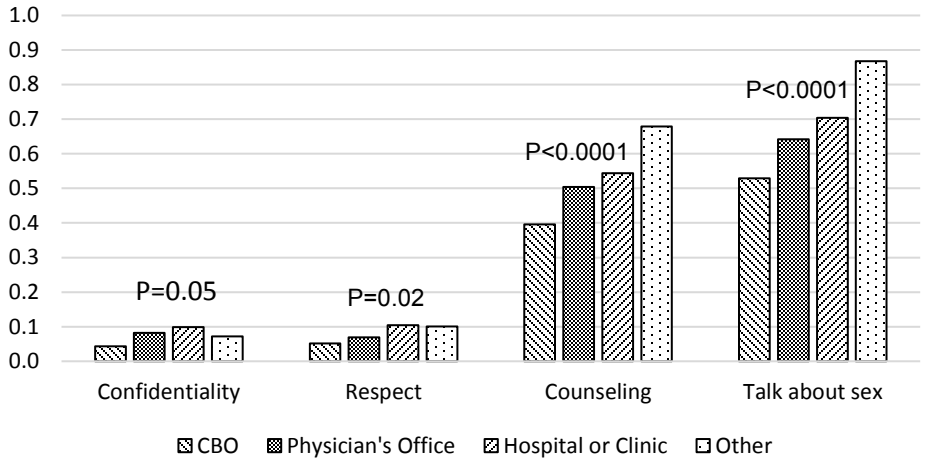

Figure 1. Percent dissatisfied with confidentiality, respect, counselling, and ability to talk about sex during HIV testing, by HIV test site. Note, “CBO” (community-based organization) includes HIV testing services that are not in a hospital or clinic, HIV testing in a bar/pub, club or sauna, or HIV testing in a mobile medical unit. “Hospital or Clinic” was created by combining inpatient and outpatient hospital/clinic test site categories. “Other” includes HIV testing at a blood bank, HIV testing using a home kit, or HIV testing “Elsewhere.”