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SHORT COMMUNICATION

Who are the men who have sex with men in Spain that have never been tested for HIV?

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Objectives

The aims of the study were to describe the sociodemographic profile of men who have sex with men (MSM) who have never been tested for HIV and to analyse factors associated with never having been tested.

Methods

The European MSM Internet Survey (EMIS) was implemented in 2010 in 38 European countries on websites for MSM and collected data on sociodemographics, sexual behaviour, and other sexual health variables. A logistic regression analysis was conducted to assess variables associated with never having been tested for HIV.

Results

Of the 13 111 respondents living in Spain, 26% had never been tested for HIV. Those who had never been tested were significantly more likely to live in a settlement with fewer than 100 000 inhabitants, be younger than 25 years old, have a lower education level, be a student, and identify themselves as bisexual. In the multivariate analysis, to have never been tested for HIV was associated with being born in Spain [odds ratio (OR) 1.35; 95% confidence interval (CI) 1.192–1.539], living outside large settlements (OR 1.37; 95% CI 1.216–1.534), being younger than 25 years old (OR 2.94; 95% CI 2.510–3.441), being out to no one or only a few people (OR 2.16; 95% CI 1.938–2.399), having had no nonsteady partners in the last 12 months (OR 1.26; 95% CI 1.109–1.422), and being not at all confident to access HIV testing (OR 3.66; 95% CI 2.676–5.003), among others factors.

Conclusions

The profile of the MSM who had never been tested for HIV indicates that most of them were men who were hard to reach (young, bisexual men, in the closet). Interventions should aim to improve access to and the convenience of testing.

Keywords: HIV, HIV testing, men who have sex with men, sexual behaviour

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Introduction

In Spain, an increase in the prevalence of sexually transmitted infections (STIs), including HIV infection, as well as high-risk sexual behaviour among men who have sex with men (MSM) has been reported in recent years. New HIV diagnoses occur predominantly among MSM. In 2011, MSM accounted for 54% of all new HIV diagnoses in Spain [1].

HIV testing is an important part of HIV prevention activities, as it is required to diagnose HIV infection. Based

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on the results of HIV testing, prevention programmes focused on the HIV status of the person may be very appropriate to reduce acquisition and transmission of the infection. The advantage of being tested regularly for HIV is that early diagnosis is vital for timely access to treatment and to control the spread of the virus. Some studies have reported that, once people know they are HIV-positive, many of them reduce high-risk sexual behaviours compared with untested people [2]. Diagnosis is also desirable because it allows early initiation of antiretroviral therapy, which reduces viral load, which in turn may reduce the risk of transmission of HIV. Serostatus awareness is beneficial at the individual and population levels, and is in line with the 'test and treat' approach to control the spread of HIV [3].

Undiagnosed HIV infection is a major potential source of the spread of infection. An important number of new infections are acquired from sexual partners whose infection is undiagnosed [4,5]. Therefore, to monitor the epidemic among MSM, it is important to know why, when and where they are tested or, conversely, why individuals do not seek HIV testing or refuse it if it is offered. In view of the relatively limited knowledge regarding MSM who have never been tested for HIV in Spain, the aims of this study were to describe the sociodemographic profile of MSM who have never been tested for HIV, and to analyse factors associated with never having been tested for HIV.

Methods

Participants

A total of 13 753 participants completed the survey. The inclusion criteria were: being male; living in Spain; being at or over the age of sexual consent in Spain; having sexual attraction to men and/or having had sex with men; indicating having understood the nature and purpose of the study; and providing consent to take part in the study. After exclusion of individuals who did not fulfill the inclusion criteria or with inconsistent data, the final sample consisted of 13 111 men.

Instrument

The questionnaire was available in 25 European languages simultaneously and included core questions on sociodemographic characteristics, risk behaviours, history of diagnoses of HIV infection and other STIs, HIV prevention needs (information, access to condoms, etc.), and service uptake.

Procedure

The European MSM Internet Survey (EMIS) was approved by the Research Ethics Committee of the University of Portsmouth, UK (REC application number 08/09:21). This study had a collective approach, including public health, academic and nongovernmental organization (NGO) sectors, and social media. The EMIS was available online for completion over the course of 12 weeks in 2010. Promotion occurred mainly through national and transnational commercial and NGO websites, and social networking websites.

Analysis

Sociodemographic characteristics and risk behaviours among tested and untested MSM were compared using the χ^2 test for proportions. Multivariate logistic regression analyses were conducted to assess characteristics associated with never having been tested for HIV.

Results

Of the 13 111 participants, 26% were untested. By size of population, untested MSM were more likely to live in cities with fewer than 500 000 inhabitants (60% versus 44% for tested MSM; $P < 0.05$). In general, untested MSM were more likely to be younger than 25 years old (43% versus 16% for tested MSM; $P < 0.05$), with a median age of 26 years versus 33 years for tested MSM. Using the International Standard Classification of Educational Degrees to categorize education level, most untested MSM had a medium (38% versus 30% for tested MSM; $P < 0.05$) or low (11% versus 8% for tested MSM; $P < 0.05$) level of education. Regarding employment, untested MSM were significantly more likely to be students (32% versus 12% for tested MSM; $P < 0.05$) compared with tested MSM. More untested MSM identified themselves as bisexual (18% versus 10% for tested MSM; $P < 0.05$) or had not yet defined their sexual identity (10% versus 7% for tested MSM; $P < 0.05$). In comparison with tested MSM, fewer untested MSM had visited commercial gay venues (72% versus 90% for tested MSM; $P < 0.05$) and sex venues (47% versus 68% for tested MSM; $P < 0.05$) in the last 12 months.

The number of nonsteady partners was lower among untested than among tested MSM. Men who reported fewer than three partners or no nonsteady partner in the last 12 months were more likely to be untested (54% versus 32% for tested MSM; $P < 0.05$). Unprotected anal intercourse (UAI) with a steady partner was more frequent among untested MSM (76% versus 73% for tested MSM; $P < 0.05$). There was no significant difference between the untested and tested MSM in relation to UAI with nonsteady partners in the last 12 months (45% versus 47%, respectively; $P > 0.05$). A higher proportion of untested MSM had UAI

with a steady partner whose HIV status was unknown or discordant (30% versus 7% for tested MSM; $P < 0.05$).

The nonuse of drugs in the last 12 months was more common among untested MSM than among tested MSM (64% versus 43%, respectively; $P < 0.05$). Almost five times fewer untested MSM than tested MSM had had a diagnosis of an STI (syphilis, gonorrhea, chlamydia, genital warts or herpes) in the last 12 months (3% versus 14%, respectively; $P < 0.05$).

Overall, more untested MSM perceived that they did not have access to free or affordable HIV testing (31% versus 7% for tested MSM; $P < 0.05$) and felt less confident to access HIV testing than tested MSM (13% versus 3%, respectively; $P < 0.05$).

Multivariate analysis confirmed some factors as being associated with never having been tested among MSM (Table 1): being younger than 25 years old [odds ratio (OR) 2.9; 95% confidence interval (CI) 2.5–3.4], living in settlements with fewer than 500 000 inhabitants (from OR 1.22 for those living in settlements of 100 000–499 999 inhabitants to OR 1.37 for those living in settlements with < 100 000 inhabitants), being 'in the closet' (OR 2.2; 95% CI 1.9–2.4), being not at all confident of access to an HIV test (OR 3.6; 95% CI 2.2–6.0), having no nonsteady partners (OR 2.5; 95% CI 1.8–3.4), not using drugs (OR 1.5; 95% CI 1.3–1.6), and not having had any STI in the last 12 months (OR 3.7; 95% CI 2.9–4.7).

Table 1 Multiple logistic regression model for never having been tested for HIV

Variable	OR	95% CI	*P*-value
Origin			
Foreign	Reference		
Born in Spain	1.35	1.192-1.539	<0.001
Settlement size			
≥ 500 000	Reference		
100 000–499 999	1.221	1.083-1.376	0.001
< 100 000	1.366	1.216-1.534	<0.001
Age			
< 25 years old	2.94	2.510-3.441	<0.001
25–39 years old	1.14	0.999-1.301	0.051
> 40 years old	Reference		
Education level*			
Low	1.189	1.003-1.410	0.046
Middle	1.143	1.028-1.271	0.013
High	Reference		
Occupation			
Employed	Reference		
Unemployed	1.123	0.956-1.318	0,157
Other†	1.246	1.095-1.417	0.001
Outness			
Out to less than half/more than half/all or almost all people	Reference		
Out to no-one or only a few people	2.156	1.938-2.399	<0.001
Steady relationship			
Yes	Reference		
No	1.255	1.109-1.422	<0.001
Number of nonsteady partners (in last 12 months)			
None	2.455	1.791-3.365	<0.001
1–2	2.239	1.621-3.093	<0.001
3–5	1.771	1.284-2.442	<0.001
6–10	1.350	0.970-1.878	0.075
11–20	1.267	0.904-1.776	0.169
21–50	1.006	0.704-1.438	0.974
> 50	Reference		
UAI with a steady male partner (in last 12 months)			
No	Reference		
Yes	0.777	0.691- 0.874	<0.001
Use of drugs in last 12 months			
Never	1.479	1.339-1.634	<0.001
Any drug	Reference		
STI diagnoses in last 12 months			
No	3.737	2.969-4.703	<0.001
Yes	Reference		
Knowledge about HIV/STI/PEP (16 items)			
None	3.229	0.787-13.244	0.104
1–4 items	3.066	1.887-4.982	<0.001
5–8 items	2.788	2.383-3.262	<0.001
9–12 items	1.848	1.656-2.062	<0.001
13–16 items	Reference		
Confident of access to HIV testing			
Very confident	Reference		
Quite confident	1.601	1.425-1.798	<0.001
A little confident	2.949	2.299-3.784	<0.001
Not at all confident	3.613	2.161-6.040	<0.001
I don't know	3.659	2.676-5.003	<0.001

CI, confidence interval; OR, odds ratio; STI, sexually transmitted infection; UAI, unprotected anal intercourse; PEP, pre-exposure prohylaxis.
*According to the International Standard Classification of Educational Degrees (ISCED).
†Including students, retired respondents and those on medical leave.

Discussion

According to the results, one in four MSM participating in the EMIS and residing in Spain had never been tested for HIV. This rate is lower than the rates found in previous studies in MSM in Spain [6,7]. This reduction may be attributable to prevention policies aimed at early diagnosis of HIV infection which have been implemented in recent years among MSM. However, the profile of the MSM who had never been tested for HIV indicates that most of them are hard to reach for research and prevention, being younger, self-identified as bisexual or other identity (e.g. heterosexual, preferring no label, etc.), and living outside large cities. This finding is similar to those of other studies [8,9] and highlights a difficulty for interventions, because men with this profile may not have access to prevention programmes (they do not often frequent the gay scene, where interventions are mainly carried out). Knowledge of the places most frequented by young MSM will help us to understand their socialization and relationships with other peers and sexual partners, to plan better recruitment in future studies, and to reach this group more effectively in order to provide them with access to prevention programmes. The finding that an appreciable proportion of

untested MSM were bisexual or had not yet defined their sexual identity supports to a certain extent the results of the multivariate analysis, which determined that those who were 'in the closet' were more likely not to have been tested. Being 'in the closet' is more common among bisexual men and men who have not defined their identity [10].

Caution must be exercised when interpreting the profile of those who had never been tested, as the results seem to indicate that these men had never been tested because they apparently did not perceive themselves to be at risk. Many of them had had few or no sexual partners (either steady or nonsteady) and had not engaged in high-risk behaviours (e.g. use of drugs), and therefore they may not have needed to be tested for HIV. However, among those who had a steady partner, there were more untested than tested MSM who had engaged in high-risk behaviours. The idea of love and partnership in this group appears to be a factor that makes them more likely to engage in sexual risk behaviours, especially among young MSM [11]. Prevention programmes should work to make this group aware of the risks of not using condoms, promote condom use and discuss strategies of negotiated safety before stopping condom use with steady partners.

This study did not explore the reasons why MSM were not tested. Such information would have allowed us to better understand the barriers MSM face in accessing and taking the HIV test. However, a previous study in Spain found that the most cited reason for not taking a test was 'not knowing where to have one' among young MSM [12].

The higher rate of never having been tested among participants younger than 25 years old suggests that more effort is needed to implement suitable outreach testing. There are several possible strategies that may be employed to accomplish this goal.

- HIV testing should be promoted in places other than the traditional ones. For example, the internet and mobile phones are suitable means by which to reach at-risk MSM who have not received any kind of in-person HIV prevention intervention [12,13].
- Increased access to and knowledge of HIV testing sites are needed.
- Prevention messages should recommend HIV testing at least annually for sexually active MSM.
- The advantages of HIV testing (e.g. early detection of HIV improves health outcomes) and improvements in its implementation (e.g. the rapid test eliminates the need for people to return to receive their results) should be promoted.
- Testing needs to be accompanied by appropriate counselling.
- Visits to health care providers (e.g. GPs) can be a great opportunity to promote testing.

Finally, it is also necessary to explore the impact of other ways to facilitate access to the test, such as home self-testing, which is still not regulated in Spain.

One of the main limitations of this study is that the sample was captured primarily on the internet. The profile of respondents surveyed via the internet can differ in many respects from that of a sample of MSM surveyed in gay venues, as has been found in other studies in Spain [7], and is probably not representative of the MSM population living in Spain.

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References

1 Centro Nacional de Epidemiología-ISCIII. Vigilancia Epidemiológica del VIH/Sida En España. 2012. Available at http://www.msssi.gob.es/ciudadanos/enfLesiones/enfTransmisibles/sida/vigilancia/InformeVIHsida_Junio2012.pdf (accessed 15 February 2013).

2 Rotheram-Borus MJ, Swendeman D, Chovnick G. The past, present, and future of HIV prevention: integrating behavioral, biomedical, and structural intervention strategies for the next generation of HIV prevention. *Annu Rev Clin Psychol* 2009; **5**: 143–167.

3 Cambiano V, Rodger AJ, Phillips AN. 'Test-and-treat': the end of the HIV epidemic? *Curr Opin Infect Dis* 2011; **24**: 19–26.

4 Goodreau SM, Carnegie NB, Vittinghoff E *et al.* What drives the US and Peruvian HIV epidemics in men who have sex with men (MSM)? *PLoS ONE* 2012; **7**: e50522. doi: 10.1371/journal.pone.0050522.

5 Marks G, Crepaz N, Janssen RS. Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS* 2006; **20**: 1447–1450.
6 Fernández-Dávila P. Prueba del VIH y variables asociadas a su realizacion en Hombres que tienen sexo con hombres de España. In: Fernández Dávila P, ed. *Conductas de riesgo, prueba del VIH y seroestatus en HSH de España*. Berlin, Editorial Académica Española, 2012: 20–38.
7 Fernández-Dávila P, Zaragoza Lorca K. [Internet and sexual risk in men who have sex with men]. *Gac Sanit* 2009; **23**: 380–387.
8 Zablotska I, Holt M, de Wit J, McKechnie M, Mao L, Prestage G. Gay men who are not getting tested for HIV. *AIDS Behav* 2012; **16**: 1887–1894.
9 Margolis AD, Joseph H, Belcher L, Hirshfield S, Chiasson MA. 'Never testing for HIV' among men who have sex with men recruited from a sexual networking website, United States. *AIDS Behav* 2012; **16**: 23–29.
10 Cox N, Dewaele A, van Houtte M, Vincke J. Stress-related growth, coming out, and internalized homonegativity in lesbian, gay, and bisexual youth. An examination of stress-related growth within the minority stress model. *J Homosex* 2010; **58**: 117–137.
11 Fernández-Dávila P, Zaragoza Lorca K. [Young men who have sex with men: a group at high risk for HIV infection?]. *Gac Sanit* 2011; **25**: 372–378.
12 Blas MM, Alva IE, Cabello R, Carcamo C, Kurth AE. Risk behaviors and reasons for not getting tested for HIV among men who have sex with men: an online survey in Peru. *PLoS ONE* 2011; **6**: e27334. doi:10.1371/journal.pone.0027334.
13 Blas MM, Menacho LA, Alva IE, Cabello R, Orellana ER. Motivating men who have sex with men to get tested for HIV through the Internet and mobile phones: a qualitative study. *PLoS ONE* 2013; **8**: e54012. doi: 10.1371/journal.pone.0054012.