



Low knowledge and anecdotal use of unauthorized online HIV self-test kits among attendees at a street-based HIV rapid testing programme in Spain



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SUMMARY

Objectives: The objectives of this study were to estimate the percentage of potential users who know that unauthorized HIV self-tests can be purchased online and the percentage of those who have already used them, and to determine socio-demographic and behavioural correlates.

Methods: A self-administered questionnaire was employed to collect data from attendees at a street-based HIV testing programme. Logistic regression for rare events was performed.

Results: Of the 3340 participants, 5.3% (95% confidence interval (CI) 4.5–6.0%) had knowledge of self-tests being sold online and 7.5% (95% CI 6.6–8.5%) thought they existed but had never seen them; only 0.6% (95% CI 0.3–0.9%) had ever used one. Knowing that self-tests are sold online (odds ratio (OR) 3.6, 95% CI 2.4–5.4) and using them (OR 7.3, 95% CI 2.2–23.8) were associated with having undergone more than two previous HIV tests. Use was also associated with being neither Spanish nor Latin American (OR 3.8, 95% CI 1.2–12.0) and with having a university degree (OR 0.2, 95% CI 0.1–0.7).

Conclusions: At the time of the study, the impact on the population of issues related to the use of unauthorized tests was very low. However, media coverage following the approval of self-testing in the USA might have changed the situation.

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1. Introduction

In July 2012, the US Food and Drug Administration (FDA) approved the first HIV test available over-the-counter for use by lay people without formal training in HIV testing and counselling, whenever, wherever, and with whomever they decide.¹ As of now, HIV self-tests are sold legally in places like the USA, South Africa, Hong Kong, and Macao.² With respect to the European Union (EU), in October 2013 the European Parliament voted for a proposal that foresees that member states may provide such tests without medical prescription, thus leaving the decision to the member

states themselves as to whether they wish to restrict HIV self-testing.³ France and the UK have recently announced that HIV self-test kits will be available in 2014.^{4–6}

A wide variety of rapid tests offered for self-testing for HIV and other sexually transmitted infections (STIs) have been marketed on multiple websites for years.^{7,8} This enables those who wish to learn their HIV status in complete privacy to choose that option. However, a study done on the topic before the release to the market of the approved HIV self-test in the USA, concluded that STI internet sites were difficult to contact and were unwilling to answer consumer-specific questions, and that test accuracy in general was poor.⁸

In this context, in 2010, when there were no published studies available on knowledge and the prevalence of use of online tests by at-risk populations, we decided to analyse the situation in Spain by gathering information from different subpopulations of potential buyers of online HIV self-tests, which are not authorized in Spain.

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The magnitude of the epidemic in Spain is now lower than in the past.⁹ However in 2010, the rate of new HIV cases, 8.9 per 100 000 population, was higher than the EU average (5.7 per 100 000 population).^{10,11} Currently, the most common transmission category is men who have sex with men (46%), followed by the heterosexual and parenteral modes of transmission (33% and 6%, respectively). Immigrants represent a substantial segment of the epidemic (35%), and 45% of overall new diagnoses are late presentation cases.¹⁰ HIV testing is a non-routine procedure and has been performed universally, confidentially, and free of charge at all levels of the public health system when requested by the patient or considered necessary by the health provider. In some cities, testing is also offered, free of charge, in HIV–STI centres and programmes run by non-governmental organizations (NGO) in non-clinical settings. Legal changes limiting access to immigrants with illegal administrative status were introduced in April 2012.¹²

The objective of this study was to estimate the percentage of people who took an HIV rapid test at a diagnostic mobile street unit knowing that an unauthorized HIV self-test can be purchased online and the percentage of those who had already used such tests, as well as examining their socio-demographic and behavioural correlates.

2. Methods

Since 2006, a programme run by an NGO has been offering free, rapid HIV testing in a mobile unit deployed in various street locations throughout Spain.¹³ Individuals interested in taking the test are given information on the characteristics, advantages, and limitations of rapid HIV testing. Those who decide to proceed sign an informed consent form and are admitted to a van, where a trained nurse/doctor completes a brief pre-counselling session. Blood is collected by finger-prick and is used to perform a Determine HIV-1/2 test. While waiting for the test result (about 20 min), participants complete an anonymous self-administered questionnaire, code-linked to their HIV test result. The questionnaire collects socio-demographic, sexual behaviour, and HIV testing history variables. For those with limited proficiency in Spanish, a different form is used to collect basic data in English and French, but it does not include the self-test module, and therefore non-Spanish-speaking attendees were not included in the present study. This study was approved by the Institutional Review Board of the Instituto de Salud Carlos III.

From November 2010 to June 2012, the programme was conducted in the cities of Madrid, Zaragoza, and Murcia and the two largest cities of the Canary Islands (Las Palmas and Santa Cruz de Tenerife). The Madrid city locations included a well-known gay neighbourhood and a neighbourhood with a high presence of immigrants. In the other cities, the van was parked in busy, centrally-located streets with substantial pedestrian traffic. Throughout that time, the questionnaire included additional questions on the participant's knowledge of the existence of internet sites that sell HIV self-test kits, and for those responding affirmatively, questions about having used one or knowing someone who has done so.

2.1. Data analysis

Of the 3932 attendees, we excluded 101 who were not Spanish-speakers, 470 who did not answer the questions about self-testing, and 21 men who have not had sex or did not provide enough information about having had sex with a man (MSM) at least once, or with women exclusively (MSW).

A descriptive analysis of the characteristics of the 3340 attendees finally included was performed by stratifying them into three categories according to gender and sexual behaviour:

women, MSW, and MSM. Men included in the latter group were those who reported having had sex with at least one man in the past. Although most of the variables were collected in a more disaggregated way, we analysed them with the categories specified in Table 1. To study the relationship with the gay culture, participants were asked if they were members of a gay community-based organization and if they frequented the 'gay scene'. To assess factors associated with knowledge and use of an unauthorized self-test, we first performed a bivariate analysis of the two main output variables (knowledge and use) with socio-demographic and risky behaviour variables by means of bivariate rare events logit regression. In view of the low prevalence of use of unauthorized tests, the number of categories of some variables was reduced, as shown in Table 2. The variables found to be significant ($p < 0.05$) were then included in a multivariate rare event logit regression model. To assess association and significance, this logistic regression enables the correction of parameters when the event being studied has a low prevalence. The finite sample correction developed by McCullagh and Nelder was then used and the procedures suggested by King and Zeng were implemented for generating approximately unbiased and lower-variance estimates of logit coefficients and their variance-covariance matrix by correcting for rare events.¹⁴ All analyses were conducted in Stata 12.1 using the `relogit` command.¹⁵

3. Results

3.1. Characteristics of the study population

Of the 3340 people analysed, 30.2% were MSM, 27.9% MSW, and 41.9% women; 58.6% were under 30 years of age (71.2% in women), 23.9% were foreigners, and 49.8% had a university degree (56.5% in the MSM). Only 2% had ever injected drugs and 51.6% had never had a previous HIV test (only 22.5% among MSM). Some 28.7% of the MSM said they were neither members of a gay community organization nor frequenters of the gay scene (Table 1).

The 592 (15%) programme attendees not included in the analysis were significantly older, non-Spanish speakers, with a low level of education, heterosexual orientation, and no previous HIV test.

Among the participants, 32 undiagnosed HIV infections were detected, with a global prevalence of 1.0% and 2.7% in MSM, 0.4% in MSW, and 0.1% in women.

3.2. Knowledge of the sale of unauthorized self-tests online

Only 176 participants (5.3%; 95% confidence interval (CI) 4.5–6.0%) knew that self-tests were available on the internet, although an additional 7.5% (95% CI 6.6–8.5) thought so but had never seen them. This knowledge (Table 2) was directly associated with being a non-Latin-American foreigner (odds ratio (OR) 1.6, 95% CI 1.0–2.7) and having undergone more than two previous HIV tests (OR 3.8, 95% CI 2.8–5.3), and conversely associated with having a higher secondary education level (OR 0.6, 95% CI 0.4–0.9) and being a woman (OR 0.4, 95% CI 0.3–0.6). However, in the multivariate rare events logit regression model, this knowledge was only associated with having undergone more than two previous HIV tests (OR 3.6, 95% CI 2.4–5.4).

3.3. Previous use of an unauthorized online self-test

Only 20 participants (0.6%; 95% CI 0.3–0.9) said they had ever used a self-test kit bought online, although in people older than 30 years, non-Latin-American foreigners, those with a low level of studies, MSW, and those with more than two previous HIV tests, this percentage reached at least 1% (Table 2). Seven of them were

Table 1
Demographic and behavioural characteristics of attendees at a street-based HIV rapid testing programme in Spain; November 2010 to March 2012

	MSM		MSW		Women		Total		p-Value
	(n = 1008)		(n = 932)		(n = 1400)		(n = 3340)		
	n	%	n	%	n	%	n	%	
Place of testing									0.000
Madrid	815	80.9	596	63.9	989	70.6	2400	71.9	
Other city	193	19.1	336	36.1	411	29.4	940	28.1	
Age group, years									0.000
<25	242	24.4	279	31.2	654	48.8	1175	36.4	
25–29	220	22.2	193	21.6	301	22.4	714	22.1	
30–34	195	19.7	174	19.5	183	13.6	552	17.1	
≥35	334	33.7	248	27.7	203	15.1	785	24.3	
Place of birth									0.123
Spain	723	75.2	662	74.1	1059	78.0	2444	76.1	
Latin America	149	15.5	147	16.5	204	15.0	500	15.6	
Other	90	9.4	84	9.4	95	7.0	269	8.4	
Place of residence (last 12 months)									0.000
Region of Madrid	690	69.4	523	56.9	830	59.9	2043	61.9	
Other Spanish region	254	25.6	358	39.0	466	33.6	1078	32.7	
Another country	50	5.0	38	4.1	90	6.5	178	5.4	
Level of education									0.000
None/primary/secondary	134	13.3	180	19.5	148	10.6	462	13.9	
Higher secondary	304	30.2	354	38.3	550	39.3	1208	36.3	
University	568	56.5	391	42.3	700	50.1	1659	49.8	
Main source of income									0.000
Paid work	805	80.3	725	78.7	939	67.9	2469	74.7	
Family or spouse/partner	103	10.3	100	10.9	274	19.8	477	14.4	
Scholarship, pension, or unemployment benefits	80	8.0	77	8.4	133	9.6	290	8.8	
Illegal activities/prostitution	8	0.8	13	1.4	24	1.7	45	1.4	
Other	6	0.6	6	0.7	13	0.9	25	0.8	
Have ever injected drugs	17	1.7	27	3.0	21	1.5	65	2.0	0.041
Relationship with gay culture ^a									
Member of a gay CBO	97	9.8							
Not member of a gay CBO but frequents the gay scene	608	61.5							
Not related to gay scene	284	28.7							
Have ever met sexual partners online ^a	492	61.7							
Previous HIV test									0.000
None	224	22.5	551	60.0	928	66.9	1703	51.6	
1–2	284	28.5	263	28.6	345	24.9	892	27.0	
More than 2	487	48.9	105	11.4	114	8.2	706	21.4	

MSM, men who have ever had sex with men; MSW, men who have sex only with women; CBO, community-based organization.

^a Questions only for MSM.

members of a gay community-based organization. In the multivariate rare events logit regression model, previous use was positively associated with not being Spanish or Latin American (OR 3.8, 95% CI 1.2–12.0) and having had more than two previous HIV non-self-tests (OR 7.3, 95% CI 2.2–23.8), and was inversely associated with having a university degree (OR 0.2, 95% CI 0.1–0.7).

Only 24 (0.7%, 95% CI 0.4–1.0) of the participants said they knew other people who had used a self-test bought online.

4. Discussion

The present study is the first to analyse the knowledge and use of an unauthorized self-test in a heterogeneous at-risk population including MSM, MSW, and women, offering a more complete picture of what may be the situation at the general population level, although all were attendees of a diagnostic programme and therefore potential users of an HIV test. Recently, a French study analysed both aspects, but it was restricted to MSM recruited on sex websites and gay and HIV community websites.¹⁶ This study shows that at the time prior to the approval of a self-test in the USA, only one in every 20 participants in a rapid test mobile programme knew of its availability on the internet and only one in 200 had used it.

In this study, knowledge was found to account for only 12.8%, less than half of the percentage found among the French MSM (30%), even when adding to the percentage of people knowing that

the test was sold online those who 'thought so but had never seen it', and despite the fact that our study started a year and a half later. Having said that, it must be noted that the French study was restricted to MSM recruited online and it is likely that most of them were users familiar with the Internet, accustomed to looking for information through this medium. However, the proportion of use among French MSM and that found in our study is very similar and close to 1% in both countries. Moreover, the difference in overall frequency of use between the two studies is mainly due to a lesser use by women, a population not analysed in France.

In the multivariate analysis, only having undergone more than two previous conventional HIV tests was associated with the knowledge of it being sold online. The same factor was also associated with an increase in use. Although other explanations (for example the 'worried well' phenomenon) could not be ruled out, we think it could be interpreted as people at persistent risk needing to seek alternative forms of periodic self-monitoring of their status. We have no data in this study to confirm this hypothesis, but having had a previous HIV test was found to be associated with an increased HIV risk in another study in the same population.¹⁷ The fact that increased use was associated with being an immigrant but not a Latin-American might indicate that in other countries its use is more widespread than in Spain or Latin-America; another reason to consider could be a lower integration of immigrants into conventional health systems in a foreign country, which leads them to seek alternative diagnostic methods.

Table 2

Knowledge and use of unauthorized self-tests available on the internet; association with socio-demographics and risky behaviours (crude and adjusted analysis)

	Knowledge				Use			
	n	%	cOR (95% CI)	aOR (95% CI)	n	%	cOR (95% CI)	aOR (95% CI)
Place of testing								
Madrid	135	5.6	1.0		16	0.7	1.0	
Other city	41	4.4	0.8 (0.5–1.1)		4	0.4	0.7 (0.2–2.1)	
Age group, years								
<30	78	4.1	1.0	1.0	5	0.3	1.0	1.0
≥30	89	6.7	1.7 (1.2–2.3)	1.0 (0.7–1.5)	14	1.0	3.7 (1.3–10.4)	2.1 (0.7–6.2)
Place of birth								
Spain	117	4.8	1.0	1.0	11	0.5	1.0	1.0
Latin America	29	5.8	1.2 (0.8–1.9)	1.1 (0.7–1.7)	4	0.8	1.9 (0.6–6.1)	1.7 (0.5–5.4)
Other	20	7.4	1.6 (1.0–2.7)	1.3 (0.8–2.1)	5	1.9	4.4 (1.5–12.8)	3.8 (1.2–12.0)
Level of education								
None/primary/secondary	33	7.1	1.0	1.0	6	1.3	1.0	1.0
Higher secondary	51	4.2	0.6 (0.4–0.9)	0.7 (0.4–1.2)	9	0.7	0.6 (0.2–1.6)	0.8 (0.3–2.6)
University	91	5.5	0.7 (0.5–1.1)	0.8 (0.5–1.2)	5	0.3	0.2 (0.1–0.8)	0.2 (0.1–0.7)
Gender/sexual behaviour								
MSM	75	7.4	1.0	1.0	9	0.9	1.0	1.0
MSW	54	5.8	0.8 (0.5–1.1)	1.4 (0.9–2.2)	9	1.0	1.1 (0.4–2.7)	2.2 (0.7–7.3)
Women	47	3.4	0.4 (0.3–0.6)	0.9 (0.6–1.4)	2	0.1	0.2 (0.0–0.9)	0.6 (0.1–2.8)
Main source of income								
Paid work ^a	144	5.7	1.0	1.0	19	0.7	1.0	
Family/partner, scholarship, pension, or unemployment benefits	30	3.9	0.7 (0.5–1.0)	0.9 (0.6–1.4)	1	0.1	0.3 (0.0–2.1)	
Previous HIV test								
≤2 (including none)	88	3.4	1.0	1.0	6	0.2	1.0	1.0
>2	84	11.9	3.8 (2.8–5.3)	3.6 (2.4–5.4)	14	2.0	8.3 (3.2–21.8)	7.3 (2.2–23.8)

cOR, crude odds ratio; CI, confidence interval; aOR, adjusted odd ratio; MSM, men who have ever had sex with men; MSW, men who have sex only with women.

^a Includes illegal activities and prostitution.

The fact that use was inversely associated with a university degree may indicate that these people have more information and criteria to assess the risks of these tests, or have greater access to traditional services.

It seems unlikely that the answers about knowledge would be contingent on recall or social desirability biases, although we cannot rule out that some participants may not have admitted the use of an unauthorized product. However, we used some strategies to temper this to some degree: the test was offered in a mobile unit, with a self-administered, anonymous questionnaire to be returned in a sealed envelope at the end of the process.

The geographic representation of this sample in relation to the global Spanish risk population is difficult to assess. We included the largest Spanish city and four cities of more than 200 000 inhabitants, including the two major cities of the Canary Islands, with no representation of the rural population. This is a sample of potential users requesting an HIV test under very special conditions. Thus, in the absence of population-based surveys, we would need other studies of potential users in other contexts to obtain a clearer picture of the situation. The study did not consider variables to establish levels of risky behaviour; therefore we were not able to explore the relationship of this with knowledge and use. On the other hand, despite having employed a special methodology to analyse the correlates of main outcomes, the variability caused by the low number of events could have caused limitations in the robustness of the estimates.

It has already been shown that the quality of some internet STI services and of STI tests offered through the internet is poor,⁸ and concerns about the consequences of the sale of HIV self-tests non-compliant with medical devices regulations have already been brought up by bodies such as the Medicines and Healthcare Products Regulatory Agency in the UK.¹⁸ We can, however, conclude that so far in Spain, the population impact of using unauthorized online HIV self-tests has been very low. Nevertheless, the extensive media coverage of the self-test approval in the USA will undoubtedly have raised the level of knowledge of its

existence, and probably its use, in Spain as well as in other countries.

It would be reasonable to believe that if a self-test is not approved in the EU, there will be an unregulated trade in the presentation approved in the USA (OraQuick), without the guaranty of compliance with handling, storage, and distribution conditions of regulated purchased tests, or any kind of telephone or web support for the interpretation of results, counselling, and referral and linkage to onward services. Additionally, other presentations will continue to be sold online, probably at a cost lower than that of OraQuick. This reality must be taken into account and the results monitored when evaluating the advantages and disadvantages of regulating these tests in EU member countries.

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Conflict of interest: No conflict of interest to declare.

References

- Epstein J. July 3, 2012 Approval Letter, OraQuick In-Home HIV Test. Silver Spring, MD: US Food and Drug Administration, US Department of Health and Human Services; 2012. Available at: <http://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/PremarketApprovalsPMAs/ucm310592.htm> (accessed December 10, 2013).
- Myers JE, El-Sadr WM, Zerme A, Branson BM. Rapid HIV. self-testing: long in coming but opportunities beckon. *AIDS* 2013;27:1687–95.
- European Parliament. Texts adopted. Tuesday 22 October 2013 – Strasbourg. Amendments adopted by the European Parliament on 22 October 2013 on the proposal for a regulation of the European Parliament and of the Council on in vitro diagnostic medical devices (COM(2012)0541 – C7-0317/2012-2012/0267(COD)). Strasbourg: European Parliament; 2013. Available at: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P7-TA-2013-0427+0+DOC+XML+V0//EN> (accessed February 3, 2014).
- Ministère des Affaires Sociales et de la Santé. Dépistage du VIH: poursuite de la procédure d'évaluation de la mise à disposition d'autotests. France: Ministère des Affaires Sociales et de la Santé; April, 5, 2013. Available at: <http://www.so->

- cial-sante.gouv.fr/actualite-presse,42/communiqués,2322/depistage-du-vih-poursuite-de-la,15731.html (accessed February 3, 2014).
5. Roy S. Sida: les autotest disponibles en France en 2014. *Le Figaro.fr*; 7-11-2013. Available at: <http://sante.lefigaro.fr/actualite/2013/11/07/21489-sida-autotests-disponibles-france-2014> (accessed February 3, 2014).
 6. UK Parliament. Early day motion 426: HIV self-testing. UK Parliament; 2012. Available at: <http://www.parliament.uk/edm/2012-13/426> (accessed December 10, 2013).
 7. National, AIDS Trust. Home testing for HIV.. A position paper by NAT on home sampling and self-testing for HIV in the UK. London: National AIDS Trust; 2008.
 8. Owens SL, Arora N, Quinn N, Peeling RW, Holmes KK, Gaydos CA. Utilising the internet to test for sexually transmitted infections: results of a survey and accuracy testing. *Sex Transm Infect* 2010;**86**:112–6.
 9. Diez M, Oliva J, Sanchez F, Vives N, Cevallos C, Izquierdo A. Incidence of new HIV diagnoses in Spain, 2004–2009. *Gac Sanit* 2012;**26**:107–15.
 10. Centro Nacional de Epidemiología. Vigilancia Epidemiológica del VIH/Sida en España: Sistema de Información sobre Nuevos Diagnósticos de VIH y Registro Nacional de Casos de Sida. Actualización del 30 de Junio de 2011. Secretaría del Plan Nacional sobre el Sida/Centro Nacional de Epidemiología; 2011.
 11. European Centre for Disease Prevention and Control/WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2011. Stockholm: ECDC; 2012.
 12. Boletín Oficial del Estado. Real Decreto-ley 16/2012, de 20 de abril, de medidas urgentes para garantizar la sostenibilidad del Sistema Nacional de Salud y mejorar la calidad y seguridad de sus prestaciones. BOE Núm. 98; 24-4-2012. Government of Spain; 2012.
 13. de la Fuente L, Rosales-Statkus ME, Hoyos J, Pulido J, Santos S, Bravo MJ, et al. Are participants in a street-based HIV testing program able to perform their own rapid test and interpret the results? *PLoS One* 2012;**7**:e46555.
 14. King G, Zeng L. Logistic regression in rare events data. *Political Analysis* 2001;**9**:137–63.
 15. Tomz M, King G, Zeng L. Rare events logistic regression, version 1.1. Cambridge, MA: Harvard University; 1999.
 16. Greacen T, Friboulet D, Fugon L, Hefez S, Lorente N, Spire B. Access to and use of unauthorised online HIV self-tests by internet-using French-speaking men who have sex with men. *Sex Transm Infect* 2012;**88**:368–74.
 17. Fernandez-Balbuena S, de la Fuente L, Hoyos J, Rosales-Statkus ME, Barrio G, Belza MJ. Highly visible street-based HIV rapid testing: is it an attractive option for a previously untested population? A cross-sectional study. *Sex Transm Infect* 2014;**90**:118.
 18. Medicines and Healthcare Products Regulatory Agency. Regulator warns against purchasing all HIV and non-compliant self-test kits over the internet. London, UK: Medicines and Healthcare Products Regulatory Agency; 2011. Available at: <http://www.mhra.gov.uk/NewsCentre/Pressreleases/CON132075> (accessed December 10, 2013).