Int J Public Health (2011) 56:559–566
DOI 10.1007/s00038-010-0215-7

ORIGINAL ARTICLE

Factors associated with HIV testing among immigrants in Portugal

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Received: 7 March 2010 / Revised: 20 October 2010 / Accepted: 21 October 2010 / Published online: 6 November 2010

Abstract
Objectives This paper describes the uptake of HIV testing and its associated factors among a sample of immigrants in Portugal.
Methods A questionnaire was completed by 1,513 immigrants at the National Immigrant Support Centre, in Lisbon. The magnitude of the association between ever been HIV tested and socio-demographic variables was estimated by means of crude and adjusted odds ratios, and their 95% confidence intervals, using logistic regression.
Results Approximately half of the participants reported having ever been HIV tested. Age, sex, educational level, region of origin, immigration status and knowing someone infected were independently associated with the HIV test uptake. Almost 90% of participants reported knowing where to obtain support on HIV-related issues. Most declared preferring doctors to get HIV information. However, only 9.2% had sought HIV information at the National Health Service.
Conclusions Our results suggest differences between migrant groups regarding HIV testing. Adopting more innovative approaches to HIV testing could improve the efficacy of HIV prevention strategies, especially among vulnerable groups within immigrant population as male and undocumented.

Keywords Immigrants · HIV · Testing · Information seeking · Portugal

This paper belongs to the special issue "Migrants and ethnic minorities in Europe: new challenges for public health research and practice".

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Introduction

Increasing population mobility for professional, leisure, political or economic reasons, combined with demographic, social and economic transitions create conditions that may lead to increased HIV transmission. Although there is limited reliable data on immigrants' health status and the prevalence of infectious diseases within this population, they are considered particularly vulnerable to HIV infection (Del Amo et al. 2004; Hamers et al. 2006). Underutilization of HIV health services for prevention, testing and treatment has been identified as a factor that contributes to vulnerability (Chee et al. 2005; Mykhalovskiy et al. 2009; Shedlin and Shulman 2004). Knowledge on HIV testing among immigrants is limited and the available data suggests a wide variation across countries; nevertheless, they tend to present high rates of undiagnosed HIV infection and to utilize HIV health services at a later stage of disease (Burns et al. 2007; Sinka et al. 2003; Williamson et al. 2009).

Improving the uptake of HIV testing is an important component of primary and secondary prevention strategies; it reduces the proportion of undiagnosed infection in the community, may ensure timely access to treatment and limit further transmission of disease (Burns et al. 2005). Timely HIV testing may lead to improved clinical

outcomes through early diagnosis and treatment, as antiretroviral therapy makes individuals less infectious (Levy et al. 2007; Saracino et al. 2005). In addition, awareness of positive sero-status promotes individual behavioural changes, and reduces risky sexual behaviour (Ehrlich et al. 2007; Schwarcz et al. 2006).

In Portugal, the proportion of foreign-born residents has increased, reaching 6.1% of the total population in 2008. Most of these immigrants have come from Brazil, Portuguese-speaking African countries and Eastern European countries (OECD 2008; SEF 2008). Since 2001, immigrants in Portugal are entitled to health care regardless of legal status, including free health care to pregnant women and recent mothers, users of family planning programmes and individuals with transmissible diseases. At the moment, Portugal provides free antiretroviral treatment to HIV patients, including foreign citizens who reside in the country.

Portugal is one of the western European countries with the highest burden of HIV infection (EuroHIV 2007). The epidemic was mainly driven by injecting drug users, but recently sexually transmitted cases are on the rise. Immigrants represent approximately 20% of Portugal's diagnosed HIV cases, accounting for a disproportionate number of new heterosexually acquired infections (ECDC 2010). During the last decade there has been a national effort to promote voluntary testing and counselling among the general population, especially directed towards the most vulnerable groups (National Coordination for HIV/Aids Infection 2007).

A better understanding of the factors associated with HIV testing among immigrants may be helpful in the development of tailored and effective strategies aimed at improving early detection of HIV infection. This paper describes the uptake of HIV testing, measured as ever having been tested, and its associated factors, among a sample of immigrants living in Portugal. This study also presents findings related to HIV information seeking.

Methods

The study sample included 1,513 immigrants who were interviewed at the National Immigrant Support Centre (NISC) premises, over a 1 month period, in 2007. The NISC, located in Lisbon, is an entity created to provide integrated answers to problems faced by immigrant citizens who reside in Portugal, regardless of legal status or any other criterion. The Centre brings together in one place different institutions in the areas of health, education, social security, employment and justice (ACIDI 2009). It gives access to socio-cultural mediators who manage each case on the basis of particular needs, within a friendly environment. Participants were approached during working hours at the NISC and all migrants that visited the Centre during the study period, and were older than 18 years, were invited to participate, immediately at arrival. In this study a migrant was defined as a non-national person who migrated to Portugal for the purpose of settlement (IOM 2004). The proportion of refusals was 14%. No information was collected from those that refused.

Data were collected by trained interviewers, especially employed by the research team for this investigation, using questionnaires in Portuguese and in English. The interviews were conducted in a private room provided by NISC during data collection. Participation was voluntary and the collected information was confidential and anonymous; oral informed consent was obtained.

The questionnaire included socio-demographic items as age, educational level, country of origin, length of stay in Portugal, employment status, immigration status and perceived economic situation. There were also questions on HIV information seeking, knowing someone infected and HIV testing. Approval for the study was obtained from the Ethical Committee of the University Hospital of S. João, Porto, Portugal.

Data analysis

For analysis, new variables were constructed after aggregating categories, such as employment status, perceived economic situation and region of origin. Proportions were compared using chi-square and Fisher tests, as appropriate. The magnitude of the associations between HIV testing and socio-demographic variables was estimated by means of crude and adjusted odds ratios (OR) and 95% confidence intervals, using logistic regression. Wald test was used and a $p < 0.10$ value was set to retain variables in the model. Interaction terms for sex and legal status were tested but no such interaction was observed. The software SPSS 16.0 was used for the statistical analysis of data.

Results

Sample socio-demographic characteristics

Of the total sample, 53.4% were male. The mean age of participants was 33.0 ± 8.9 years. Among participants, 50.5% were from Latin America (mostly from Brazil: 99.3%), 34.8% were from Africa (mostly from Portuguese-speaking countries: Cape Verde, 31.6%; Angola, 25.9%; Guinea Bissau, 24.1%; Sao Tome and Principe, 11.3%; Mozambique, 3.1%), 11.9% were from Eastern Europe (Ukraine, 32%; Romania, 27.5%; Moldavia, 24.5%; other

countries, 16.3%), and 2.9% were from Asia (India, 47.7%; Pakistan, 29.5%; other countries, 22.7%). Educational level was high: 64.7% had more than 10 years of schooling. Overall, 80.1% of participants were employed and 50.2% classified their economic situation as satisfactory. Around half of participants were living in Portugal for more than 5 years and 53.6% reported to have a legal status. There were significant gender differences: male migrants were significantly more often employed, satisfied with their economic situation, documented, and living for longer periods in Portugal. The sample includes few Asian women (Table 1).

HIV information seeking and having a relative or friend who is infected

Approximately 80% of the participants stated they would use the National Health Service (NHS) structures—Hospital or Health Centre—if they faced HIV-related issues, while only 10% admitted that they did not know where to go (Table 2). Participants reported that they would prefer to get information about HIV from doctors (62.8%), followed by the internet (20.5%) and friends or relatives (6.5%). Only 9.2% of respondents reported having sought information about HIV at the NHS. No gender differences

Table 1 Sample socio-demographic characteristics by gender ($n = 1{,}513$) (Lisbon, 2007)

	Total		Female		Male		p
	N	%	*N*	%	*N*	%	
Sex							
Total	1,513	100	705	46.6	808	53.4	
Age (years)							
≤25	316	20.9	168	23.8	148	18.3	0.071
26–30	343	22.7	156	22.1	187	23.1	
31–40	551	36.4	247	35.0	304	37.6	
41–69	303	20.0	134	19.0	169	20.9	
Years of school attendance							
0–4	101	6.7	51	7.2	50	6.2	0.582
5–9	432	28.6	191	27.1	241	29.8	
10–12	686	45.3	321	45.5	365	45.2	
13 or more	294	19.4	142	20.1	152	18.8	
Employment status							
Unemployed/student/housekeeper/retired	301	19.9	168	23.8	133	16.5	<0.001
Employed	1,212	80.1	537	76.2	675	83.5	
Perceived economic situation							
Very insufficient/insufficient	753	49.8	391	55.5	362	44.8	<0.001
Sufficient/more than sufficient	760	50.2	314	44.5	446	55.2	
Region of origin							
Africa	522	34.8	246	35.1	276	34.5	<0.001
Asia	44	2.9	5	0.7	39	4.9	
Eastern Europe	178	11.9	80	11.4	98	12.2	
Latin America	758	50.5	370	52.8	388	48.4	
(Missing)	(11)		(4)		(7)		
Immigration status							
Legal	783	53.6	338	49.8	445	56.9	0.002
In process of regularization	557	38.1	269	39.6	288	36.8	
Undocumented	121	8.3	72	10.6	49	6.3	
(Missing)	(52)		(26)		(26)		
Length of stay in Portugal (years)							
0–2	322	21.3	184	26.1	138	17.1	<0.001
3–5	435	28.8	208	29.5	227	28.2	
5 years or more	753	49.9	313	44.4	440	54.7	
(Missing)	(3)		–		(3)		

Table 2 HIV information seeking and having a relative or friend who is infected by origin ($n = 1,502$) (Lisbon 2007)

	Total		African		Asian		Eastern European		Latin American		
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*p*
Where to go if having HIV-related issues											
Don't know	151	10.0	36	6.9	8	18.2	31	17.4	76	10.0	<0.001
Health Centre	542	36.1	201	38.5	7	15.9	70	39.3	264	34.8	
Hospital	605	40.3	239	45.8	22	50.0	41	23.0	303	40.0	
Health Centre and Hospital	43	2.9	14	2.7	3	6.8	8	4.5	18	2.4	
National Coordination for AIDS	46	3.1	8	1.5	1	2.3	5	2.8	32	4.2	
Private medicine	74	4.9	15	2.9	2	4.5	18	10.1	39	5.1	
Others	41	2.7	9	1.7	1	2.3	5	2.8	26	3.4	
Main source of information about HIV that would use											
Friends and family	98	6.5	25	4.8	10	22.7	18	10.1	45	5.9	<0.001
Doctors	942	62.8	369	70.7	18	40.9	106	59.6	449	59.2	
TV, radio, newspapers	41	2.7	12	2.3	3	6.8	9	5.1	17	2.2	
Internet	308	20.5	74	14.2	9	20.5	31	17.4	194	25.6	
Other	113	7.5	42	8.0	4	9.1	14	7.9	53	7.0	
Having sought information about HIV at NHS											
Yes	138	9.2	77	14.8	5	11.4	7	3.9	49	6.5	<0.001
No	1,363	90.8	445	85.2	39	88.6	171	96.1	708	93.5	
(Missing)	(1)		–		–		–		(1)		
Having a relative/friend infected											
Yes	259	20.9	76	18.5	6	15.8	19	12.8	158	24.6	0.004
No	981	79.1	335	81.5	32	84.2	129	87.2	485	75.4	
(Missing)	(262)		(111)		(6)		(30)		(115)		

were observed ($p < 0.423$). Around one-fifth of participants knew someone infected (friend or relative). Analysis by region of origin indicated that immigrants from African countries reported more frequently to have sought information about HIV at the NHS (14.8%) than those from Asia (11.4%), Latin America (6.5%) or Eastern Europe (3.9%) ($p < 0.001$). Asians and Eastern Europeans more frequently said to ignore where to go if facing HIV problems. Africans more frequently referred doctors as a source of information, while Asians significantly more often indicated family. Africans and Latin Americans more frequently admitted to have a close relative or friend who is infected.

HIV testing

Approximately half of participants (51.2%) reported ever having been tested for HIV, women more frequently than men (55.3 vs. 47.6%, $p = 0.003$). Analysis by region of origin showed that immigrants from Latin America reported more frequently having been tested (55.9%) compared with those from Africa (51.7%), Asia (36.4%) and Eastern Europe (33.7%) ($p < 0.001$) (Table 3).

Among the 775 participants ever tested, 75% had their last test in the previous 4 years (median 2). Around 62% had their last test in Portugal; among those 47.5% were Africans, 44.3% were Latin Americans, 7.0% were Eastern Europeans and 1.3% were Asians ($p < 0.001$).

The logistic regression analysis allowed the independent identification of increasing age (OR = 2.51, IC95% = [1.81–3.48], compared to less than 25 years) and education (OR = 3.72, IC95% = [2.19–6.32], compared to less than 5 years), female sex (OR = 1.40, IC95% = [1.12–1.74]), infection among family or acquaintances (OR = 1.36, IC95% = [1.01–1.83]), and legal status (OR = 1.27, IC95% = [1.02–1.59]) as positively associated with having been tested for HIV. Also, HIV testing was associated with region of origin: Africans (OR = 2.53, IC95% = [1.72–3.72]) and Latin Americans (OR = 2.78, IC95% = [1.94–4.00]) more frequently reported ever been tested than Eastern Europeans or Asians (Table 3).

Discussion

To our knowledge, this is the first quantitative study among immigrant communities in Portugal that addressed HIV testing and its associated factors.

Our study aimed to describe the proportion of, and the factors associated with, the uptake of HIV testing among

Table 3 Socio-demographic factors associated with immigrants ever being tested for HIV (Lisbon, 2007)

	HIV testing prevalence [*N* (%)]	Crude OR (CI 95%)	Adjusted OR (CI 95%)[b]
Total	775 (51.2)		
Sex			
Male	385 (47.6)	1	1
Female	390 (55.3)	1.36 (1.11–1.67)	1.40 (1.12–1.74)
Age (years)			
≤25	118 (37.3)	1	1
26–30	206 (60.1)	2.52 (1.84–3.45)	2.51 (1.81–3.48)
31–40	300 (54.4)	2.01 (1.51–2.66)	2.10 (1.56–2.84)
41–69	151 (49.8)	1.67 (1.21–2.30)	1.87 (1.31–2.65)
Years of school attendance			
0–4	35 (34.7)	1	1
5–9	220 (50.9)	1.95 (1.25–3.07)	2.04 (1.25–3.33)
10–12	346 (50.4)	1.92 (1.24–2.97)	2.23 (1.36–3.66)
13 or more	180 (59.6)	2.78 (1.74–4.45)	3.72 (2.19–6.32)
Employment status[a]			
Employed	618 (51.0)	1	–
Not employed	157 (52.2)	1.05 (0.81–1.35)	–
Perceived economic situation[a]			
Sufficient/more than sufficient	380 (50.0)	1	–
Very insufficient/insufficient	395 (52.5)	1.10 (0.90–1.35)	–
Region of origin			
Eastern Europe	60 (33.7)	1	1
Asia	16 (36.4)	1.12 (0.56–2.24)	1.20 (0.59–2.44)
Africa	270 (51.7)	2.11 (1.48–3.00)	2.53 (1.72–3.72)
Latin America	424 (55.9)	2.50 (1.77–3.52)	2.78 (1.94–4.00)
Immigration status			
Undocumented/in process of regularization	323 (47.6)	1	1
Legal	415 (53.0)	1.24 (1.01–1.52)	1.27 (1.02–1.59)
Length of stay in Portugal (years)			
0–2	156 (48.4)	1	–
3–5	223 (51.3)	1.12 (0.84–1.49)	–
5 years more	395 (52.5)	1.17 (0.90–1.52)	–
Knowing someone infected			
No	477 (48.3)	1	1
Yes	153 (58.6)	1.52 (1.15–2.00)	1.36 (1.01–1.83)

[a] Not included in the model *p* higher than 0.10

[b] Adjusted for sex, age, education, region of origin and legal status

immigrants. We found a 51.2% prevalence of ever being HIV tested, which is higher than the one estimated in a survey of the general Portuguese population (44% of a representative sample of people 16–64 years old reported in 2009 having been tested for HIV in the National Survey of Sexual Behavior and HIV infection, National Coordination for HIV/Aids Infection). Similar to these results, Fenton et al. (2002) also found higher rates of reported HIV testing among immigrants compared to the general UK population. Although we did not explore the participants' reasons for having been tested, few studies have pointed out prenatal care, concern about risk of HIV/AIDS to self or partner, general health checkup, health problems including surgery, STI and requirements for insurance and mortgage (Burns et al. 2005; Stolte et al. 2003). Nevertheless, research on reasons for HIV testing among migrants is sparse.

In this study, among those who had been tested for HIV, 61.7% reported to have had the last test in Portugal. One of the main goals of National Programme for the Prevention and Control of the HIV/Aids is to generalize access to early detection of infection. Therefore, efforts have been undertaken to make routine voluntary testing available in health services and promote HIV testing among vulnerable

groups in cooperation with non-governmental organizations and Counselling and Early Detection Centres. These strategies concurrently with the guarantee of free access to counselling, diagnosis and appropriate referral for populations that find it difficult to access formal health care services can promote the uptake of HIV testing. Nevertheless, the previously described high proportion of undiagnosed HIV infection and the late diagnosis in immigrant groups remain a significant challenge for health gain (Levy et al. 2007; Williamson et al. 2009).

In our sample, the majority of the participants would use the NHS structures if they faced HIV-related issues and would prefer to get information about HIV from doctors. However, we found evidence of lack of information about HIV health services (10% of respondents reported not to know where they could obtain support). This is a relevant finding as lack of awareness of the availability of health services can act as barrier to their use (Lai and Chau 2007). Providing information on how and where to access HIV health services may help to ensure adequate and timely use of these services. Consequently, it may contribute to improving uptake of HIV testing and early diagnosis, once HIV testing is more likely when health care providers initiate discussion and emphasize its benefits (Fernandez et al. 2000). In this sense, efforts have been undertaken by national entities in cooperation with the civil society to improve immigrants' information on the services available and promote health services' use (ACIDI 2007).

In our study, only 9.2% reported having actually sought HIV information at the health services. This finding highlights potential opportunities to work on HIV prevention within the health system. The results also indicate a discrepancy between being favourable to the use of the NHS to obtain HIV information and actually using it. Although we did not collect information on reasons for not using HIV services, several studies have pointed out the influence of factors at individual, providers, institutional and policy level (Deblonde et al. 2010; Manirankunda et al. 2009). Future investigation in this field would be valuable.

Our results suggest differences between migrant groups regarding HIV testing. Women are more likely to report having been tested. Gender differences may be explained by the fact that migrant women are mostly of reproductive age and more likely to use health services related to sexual and reproductive health (Burns et al. 2005; Fernández et al. 2005), like prenatal care where HIV test is offered as a routine procedure. In Portugal, universal antenatal care, including HIV testing, is available regardless of legal status.

In our findings, being undocumented was significantly associated with lower odds of had been HIV tested. This may be partly explained by the fact that undocumented migrants are more likely to report less utilization of health services (Derose et al. 2007; Dias et al. 2008) and evidence shows that the underuse of health services hinders the uptake of HIV test (Williamson et al. 2009). Indeed, these immigrants may face obstacles in accessing HIV health services (Baptista-Gonçalves 2009). In Portugal, HIV testing is non-mandatory and can be done anonymously, confidentially and for free at the HIV Early Detection and Counselling Centres. However, mistrust of health services confidentiality, fear of discrimination and exclusion, and lack of awareness of the services available may still be reasons for not having been tested, as pointed out by other authors (Levy et al. 2007; Burns et al. 2007). In this context, innovative strategies to promote and generalize HIV testing should be developed, focused mainly on addressing hard-to-reach groups as undocumented migrants.

The data show substantial variations in reported HIV testing across region of origin. Latin American and African participants were HIV tested significantly more often even after adjusting for other characteristics. Individuals who had been tested for HIV are more likely to perceive themselves at greater risk of acquiring HIV due to the high HIV prevalence in their countries of origin. Also, these immigrants are mostly from countries where Portuguese is the official language which may explain African and Latin American participants' higher proportion of HIV testing, especially regarding the uptake of HIV testing in Portugal. Linguistic differences have been pointed out in several studies as predictive of having never been tested for HIV and as a factor associated with underutilization of sexual health services among immigrants (Dias et al. 2004; Scheppers et al. 2006). In Portugal, immigrants from Eastern Europe and Asia face more linguistic barriers related to health services than immigrants coming from Latin America and Africa (Dias et al. 2008, Use of Health Care Services by Portuguese Immigrants, EUPHA 2nd Conference of Migrant Health in Europe).

Having high level of education and being older than 25 years old were positively associated with having been tested for HIV. Previous research indicates that higher education is associated with higher levels of HIV knowledge, awareness of availability of health services and higher rates of HIV testing (Dias et al. 2004; Burns et al. 2005; Wong et al. 2004). These individuals may be more likely to perceive the disease as a personal danger, and to recognize its consequences and the importance of protective measures (Norman and Gebre 2005; Worthington and Myers 2003).

Around 21% of respondents reported having a close relative or friend who was infected with HIV; this variable was associated with higher odds of had been HIV tested. Studies have pointed out that knowing someone with HIV/AIDS may result in more positive attitudes toward HIV testing (Kalichman and Simbayi 2003). Increased knowledge and

more positive attitudes may help individuals to recognize the benefits of the HIV test (Norman and Gebre 2005).

Some of these findings may be biased due to our selection procedure. Collecting data only from migrants presenting themselves at the NISC leads to an overrepresentation of more affluent and better integrated migrant groups. On the other hand, as this centre is viewed by immigrants as an independent institution dedicated to solving individual integration problems, we are confident that the sampling procedure allowed for a fairly representative sample of immigrant conditions. Some immigrants for whom a translated questionnaire was not available may have been excluded from the study, though most who do not speak Portuguese or English come with a friend or family member who could offer support in the completion of survey forms. As the response rate was high, we are confident that these findings reflect the situation of a large group of immigrants living in the Metropolitan Area of Lisbon.

A greater understanding of the factors associated with HIV testing among immigrant populations is relevant for the design of services and for resource allocation. This study has focused mainly on ever being tested, yet the determinants of effective testing (leading to HIV early diagnosis) need to be explored. This information may help public health officials to develop initiatives focused on reducing late testing.

The development of effective HIV prevention strategies involves providing information about the HIV health services available and promoting their use among the immigrant population. Adopting more innovative approaches to HIV testing among immigrants could improve the efficacy of HIV prevention strategies, especially among vulnerable groups within immigrant population as male and undocumented. Effective strategies may include promoting communities' participation in the planning and development of HIV prevention interventions, including community-based voluntary testing.

Acknowledgments The authors wish to thanks to High Commission for Immigration and Intercultural Dialogue (ACIDI), IOM and Helena Vaz, Carla Martingo, Catarina Oliveira and Raquel Lucas. The authors wish to acknowledge valuable feedback and reviews provided by Prof. Gilles Dussault.

Conflict of interest The authors declare that they have no competing interests.

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