Time since the last HIV test and migration origin in the Paris metropolitan area, France.

Annabelle Lapostolle[a,b,*], Véronique Massari[a,b], Pierre Chauvin MD[a,b,c]

[a] INSERM, UMRS 707, F-75012, Paris, France

[b] UPMC Univ Paris 06, UMRS 707, F-75012, Paris, France

[c] AP-HP, Hôpital Saint-Antoine, Unité de Santé Publique, F-75012 Paris, France

*Corresponding author: INSERM UMRS707, UPMC, 27 rue Chaligny, 75012 Paris, France.

Tel.: +33 1 44 73 86 44; fax: +33 1 44 73 84 62

E-mail address: annabelle.lapostolle@inserm.fr

ABSTRACT

In France, newly diagnosed infection rate was 372/100,000 for African immigrants versus 6/100,000 for the French-born population in 2008. In addition, people from sub-Saharan countries were at higher risk for late diagnosis than native-born French despite their more frequent use of HIV testing. The purpose of this study was to compare the mean time since the last HIV test according to migration origin. This study used data from the SIRS (a French acronym for health, inequalities and social ruptures) cohort, which, in 2005, included 3023 households representative of the greater Paris area. HIV testing uptake and the time since the last test were studied in relation to socioeconomic factors, psychosocial characteristics, and migration origin. Multivariate ANOVA analyses were performed using Stata 10. People from sub-Saharan Africa were more likely to have been tested in their lifetime (78.51%) than those of French (56.19%) or Maghreb (39.74%) origin (p<0.0000). The mean time, in years, since the last HIV test was shorter among sub-Saharan immigrants and Maghreb immigrants (2.15 and 2.53 years respectively) than among native-born French (4.84 years) (F=12.67; p<0.0000). These differences remained significant even after adjusting for gender, age, number of steady relationships, time lived in France, and difficulty reading and/or writing French (F=5.73; p=0.0007). A gender analysis revealed the same pattern for both sexes, with greater differences in the mean duration by migration origin for women. These results and recent epidemiological data seem to show that since the early 2000s, measures aimed at increasing HIV testing and decreasing late diagnosis in sub-Saharan immigrants have been effective.

Keywords : HIV testing, migrants, socioeconomic factors, France

Word count: 3468

INTRODUCTION

Since the advent of effective treatments against HIV, the benefits of timely access to treatment after HIV infection have been largely documented in terms of morbidity and mortality reduction, (Girardi et al., 2004; Hogg et al., 2001; Palella et al., 2003; Sabin et al., 2004). Timely access to treatment requires not only adequate postdiagnostic management, but timely testing as well. The current trend is to treat patients earlier and earlier, since initiating therapy when the CD4 count is ≤350/µL increases the risk of AIDS or death by 28% compared to initiating it when the count is between 351/µL and 450/µL (Sterne et al., 2009).

In France, HIV testing policy is based on the opt-in approach. HIV testing is widely delivered in hospitals, in public and private laboratories, in free and anonymous testing centres, and also largely provided in primary care (Massari, Dorleans, & Flahault, 2005; Mounier-Jack, Nielsen, & Coker, 2008). HIV testing is offered systematically by health professionals to some specific populations (pregnant women, new tuberculosis patients, prisoners). Mandatory screening concerns only blood, sperm and tissue donors. Despite this large offer of testing, 36% of infected individuals are tested when they already have an AIDS defining illness or are greatly immunocompromised (InVS, 2006). The specific risk of late testing in immigrant populations has been reported several times, in particular in people of African origin, (Chee et al., 2005; Delpierre, Cuzin, Lauwers-Cances, Marchou, & Lang, 2006; Delpierre et al., 2007; Dray-Spira & Lert, 2003; Lanoy et al., 2007). In 2003, France's public authorities initiated HIV prevention information campaigns targeted at these populations. A study conducted in 2003 revealed two categories of immigrants who have been diagnosed late: men who have been in France for a long time and for whom late testing is associated primarily with delaying their entry to the health-care system, and young women who have recently arrived and for whom late testing is due to the duration between infection and migration (Calvez, Semaille, Fierro, & Laporte, 2006).

Recently, a new testing paradigm was proposed in France, with recommendations from the Haute Autorité de Santé (High Health Authority)(HAS, 2009) which, for the first time, proposed screening schedules on the basis of results from modelling studies among high-risk populations (multi-partner MSM, IDUs, and multi-partner individuals from sub-Saharan Africa or the Caribbean). For them, it is now recommended that HIV screening be done every year.

In this context, the purpose of this study was to compare the amount of time since the last HIV test according to the migration origin of the residents of Paris metropolitan area

3

(which is, of all the regions in mainland France, the one with the highest number and proportion of AIDS cases and immigrant people). We aimed to determine, in particular, the mean time since the last test in people of African origin and to study if the potential effect of nationality was in relation to the duration of time lived in France and the difficulties in writing/reading French.

METHOD

Data collection

The SIRS (a French acronym for health, inequalities and social ruptures) cohort is the first large, representative, population-based French cohort set up to study the social determinants of health and health-care utilization in the field of social epidemiology (Chauvin & Parizot, 2009; Renahy, Parizot, & Chauvin, 2008).

Our study population was a multistage-random sample of the adult French-speaking population living in the Paris metropolitan area. The primary sampling units were census blocks: 50 of them were randomly selected from the 2595 eligible census blocks in Paris and its suburbs, according to their socioeconomic type. At the second level, 60 households were chosen at random in each census block. Lastly, one adult in each household was randomly selected for interviewing using the next-birthday method (the adult chosen was the person in the household who will have the next birthday).

The questionnaires were administered face-to-face at the interviewee's home. In all, 29% of the individuals contacted declined to answer the survey, 2% said that they were too sick to answer, and, lastly, 3% were excluded because they did not speak French. The questionnaires thus administered to 3023 people gathered information on more than 400 variables concerning, among other things, economic status, social integration, health, health-related behaviours, and the use of the health-care system.

4

Variables

Of interest here is the date of the last HIV test performed among those individuals who reported having been tested at least once in their lifetime. Of the 3023 individuals interviewed, one person did not want to answer, 30 indicated that they did not know whether or not they had ever been tested, 1286 (42.5%) had never been tested, and, lastly, 1706 (56.4%) indicated that they had been tested for HIV. Amongst these people, 1642 (96.2%) answered the question "how many years it had been since their last test".

Based on previous analyses of the determinants of HIV testing uptake in the cohort (Massari, Lapostolle, Parizot, & Chauvin, 2009; Wynne, Massari, Cadot, King, & Chauvin, 2009), the following variables of interest were chosen for the analyses: age which was divided into four groups (18-29 years, 30-44 years, 45-59 years and 60 years and older); socio-professional groups (derived from the French national bureau of statistic which distinguishes between worker, employee, craftsmen/shopkeepers, executive/management, intermediary position, and never employed and/or students – retired or unemployed people being classified according to their last job); the number of sequential steady relationships (0, 1, 2 and 3 or more); the sense of belonging to an ethnic or religious community (yes/no); the feeling of being at risk to contract HIV (yes/no), the fact of having reported difficulty reading and/or writing French (yes/no).

To study migration origin, we used 1) the nationality at the time of the survey (the foreign-born migrants which had previously obtained French citizenship were then counted as French) and 2) the number of years lived in France: for those individuals who indicated that they had spent their entire lives in France (whatever their nationality), it was their age. Nationalities were divided into large geographic groups: France, Sub-Saharan Africa, Maghreb (Northwest Africa), and others.

5

The fact of having a child born after 1990 (vs. before 1990 or no children) was also included in the analyses. This is because in France, in 1993, a law provided for the systematic offer of HIV testing to all pregnant women during their first prenatal visit. However, this practice had already become widespread several years before this law came into existence, hence our decision to distinguish between births before and after 1990 (rather than 1993).

Statistical analyses

All the proportions and mean values presented in this paper were weighted to account for the complex sample design and for the poststratification adjustment for age and gender according to the general population census data provided by the INSEE, the French bureau of statistics.

We first performed a univariate analysis of the factors associated with having or not having been tested at least once during one's lifetime and with the mean time since the last test. The statistical tests performed were the chi-square test for proportions and ANOVA analyses for the intergroup mean differences (Kleinbaum, Kupper, Muller, & Nizam, 2008). Multivariate linear regression and ANOVA analyses were then performed for the variables found to be significantly associated in the univariate analysis. ANOVA measures two sources of variation in the data and compares their relative sizes. The F-statistic is the ratio of the between group variation divided by the within group variation. Finally, we performed two regression models: a first one to measure the effect of the nationality, a second one to tease out whether the potential effect of nationality was in relation to the duration of time in France and the difficulties in writing and/or reading French.

All the statistical processing was performed with STATA 10[©].

RESULTS

In 2005, 51.32% [47.15-55.48] of the men (n=730) and 58.94% [54.94-62.28] of the women (n=943) indicated that they had been tested for HIV during their lifetime (Table 1).

6

For both sexes, the proportion of tested individuals was the highest in the 30-44 age-group, in people in upper white-collar positions and higher-level intellectual occupations, individuals who had had numerous steady relationships, and those who had had a child after 1990.

The proportion of men who had been tested was significantly lower among those who indicated that they had a sense of belonging to an ethnic or religious community.

We observed, for both sexes, significant differences according to the country group. The highest proportion of individuals who indicated that they had been tested for HIV during their lifetime was found to be among those of sub-Saharan African nationality: 58.71% [36.44-77.91] for men and 93.22% [85.35-97.01] for women. On the other hand, individuals of Maghreb nationality reported less often having had been tested at least once during their lifetime than the other nationality groups: 35.53% [24.56-48.27] for men and 44.45% [33.36-56.12] for women.

The proportion of men who had previously been tested for HIV was significantly lower for those who reported having difficulty reading and/or writing French: 33.18% [25.59-41.77] versus 53.97% [49.63-58.25] for those who said that they did not have any difficulty. This difference was observed in women as well, although it was not significant: 50.24% [40.95-59.51] and 60.03% [55.75-64.16]. Among women, we also observed significant differences based on the number of years lived in France.

Table 2 presents, for the individuals for whom a duration was available (n=1642), the mean time (in years) since the last HIV test by gender, and the univariate ANOVA analyses for each category of variables. We did not observe any differences in mean time since the last HIV test between men and women.

Among men, the shortest mean times were observed among those aged 18-29 years, those who were occupationally inactive, those who had not been in a steady relationship, those who did not have a child born after 1990, those of Maghreb nationality (2.28 years

[1.03-3.53]), those who had lived in France for less than five years (1.80 years [0.00-3.97]), and those who indicated that they had difficulty reading and/or writing French (3.19 years [2.19-4.19]). No significant difference in the mean time since the last test was observed based on belonging or not to an ethnic or religious community.

Among women, we also noted significant differences in the mean time since the last test according to age, occupational activity, having or not having had a child after 1990, nationality (F=8.95, df=3, p<0.0001) and the amount of time lived in France (F=10.67, df=3, p<0.0001). In By contrast to the results observed for men, the shortest mean time since the last test was found in women who had had a child after 1990 and in those of sub-Saharan nationality (1.66 years [0.95-2.37]).

In the first model of multivariate anova analysis among men (Table 3), the duration in years since the last HIV test was statistically different among age-groups (F=6.34, df=3, p<0.01) and according to birth after 1990 (F=8.52, df=1, p<0.01) and nationality (F=4.59, df=3, p<0.01). Coefficients issued from the multivariate linear regression showed that being aged of 30 years or more, and having had a baby after 1990 were associated with a longer duration since last test whereas being a foreigner from Sub-Saharan Africa or Northwest Africa was associated with having an HIV test more recently compared with French men.

In the second model, differences between age-groups and having had a birth after 1990 or not remained statistically significant and linear regression coefficients stayed very stable. The intergroup difference in nationality was no longer significant with a F-value decreasing from 4.59 (in the first model) to 2.02. The linear regression coefficient increased for every foreigner nationality groups and remained statistically significant for Sub-Saharan Africans compared to French men with a coefficient of -1.88(-3.68,-0.07).

In women, in both models, only age, socio-occupational category and nationality showed significant mean time intergroup differences after adjusting for the other variables

8

(Table 4). Unlike for men, the differences between nationality groups remained significant after introducing the amount of time lived in France and the difficulties reading and/or writing French (F=2.77, df=3, p=0.04). As observed in men, for women also, linear regression coefficients increased for Sub-Saharan Africans and Northwest Africans in the second model, compared to the first one.

DISCUSSION

The data available for the SIRS cohort in 2005 show a high level of testing uptake among people from sub-Saharan Africa in Paris metropolitan area compared to those from other countries. Thus, in our survey, the proportion of sub-Saharan Africans who indicated that they had been tested during their lifetime was 78.5% versus 56.2% for native-born French. This finding is consistent with another study of African populations on the Île-de-France carried out in 2005 (Lydié, 2007). In that survey, the lifetime testing rate in this population was 64.9% versus 53.9% for native-born French (population aged 18-49 years).

Our results also show strong differences according to gender, in particular, and once again, among African populations (93.22% in African women vs. 58.71% in men). As well, regardless of their nationality, women stated more often than men that they had had an HIV test during their lifetime. This difference can be explained, at least in part, by the strong acceptance of the screening tests (free of charge) systematically offered in France to all women during their first prenatal visit (Moatti, Le Gales, Seror, Papiernik, & Henrion, 1990). This can also explain the high proportion of Sub-Saharan African women who had ever been tested as they were more often to declare a birth after 1990 (76.06%[64.13-84.95] vs. 31.7%[28.14-35.49] for French women).

One of the main limitations of our study lies in the cohort inclusion criteria. For instance, this survey was conducted among people living in "ordinary households", with the result that people living in collective dwellings (e.g., senior citizens' homes, homeless shelters

9

and military barracks) were not included. Also, only French-speaking people were interviewed. Yet, we observed that the individuals (of both sexes and regardless of their nationality, even if the sample became too small for differences to be significant) who indicated that they had difficulty reading and/or writing French were less likely to have been tested once during their lifetime, which suggests that non-French-speaking people are more likely not to avail themselves of the HIV test.

In addition, for some of the individuals surveyed, particularly those who had difficulty understanding French, it is possible that there was some confusion between certain laboratory tests and the HIV test that could have led to overreporting of HIV testing uptake and an underestimate of the mean time since the last test. Nonetheless, to the best of our knowledge, this type of bias has never been described in other studies, and this bias cannot be measured with the data at our disposal. Furthermore, the mean differences between nationalities are very large, and if there is a bias that minimises these differences, it is unlikely that it would erase them completely. Finally, the retrospective questioning of the time since the last test may be skewed by memory biases but, because these times are longer for French-born people and for established immigrants, such bias leads instead to an underestimation of the differences observed between them and more recent immigrants.

In this study, no data were gathered on risk-taking (which may motivate the need for a test). Another possible cofactor, the self-perceived risk for HIV infection, was collected in our study but we did not take it into account in our regression models since no information was available on the circumstances of the last test performed. Because this last test could have been voluntary, systematic or mandatory as well, it did not seem meaningful to further explore such an association. Actually, even if people from sub-Saharan Africa interviewed in our study stated more often that they felt at risk for contracting HIV (24% vs. 16% of those of French nationality), its introduction in our models led to a non significant association and did

10

not change our estimates. Moreover, to feel at risk for HIV infection may be ambiguously linked with individuals' testing attitudes and practices. A European review showed that, in Africans with high perception of risk, fear of death and disease may constitute a barrier for HIV testing, especially for those unable to access HIV care, either in their country of origin or in Europe (Fakoya, Reynolds, Caswell, & Shiripinda, 2008).

For both men and women, the longer the individual had lived in France, the longer, on average, the amount of time since the last test. These different elements can be explained in two different manners. On the one hand, over time, an acculturation phenomenon might lead immigrant populations to adopt health behaviors that are closer to those of the population of the host country (Jusot, Silva, Dourgnon, & Sermet, 2009). On the other hand, it is possible that new immigrants are frequently tested when they settle in France and sometimes very quickly after their arrival. Indeed, a study on late HIV diagnosis in France found that the risk of late testing among immigrants increases during the first year in France (aOR: 2.15; 95% CI: 1.04-4.47). Among HIV-infected immigrants, the frequency of the combination of arriving in France and a diagnosis indicates an infection in the country of origin and a screening test (proposed by a physician or on the individual's initiative) upon arriving in France (Delpierre, et al., 2007).

For men, the duration of residence and difficulty mastering French no longer appeared to be significant after the different individual variables were taken into account. Nonetheless, it seems that these two variables explain, in large part, the differences in the mean time since the last HIV test between the nationality groups, since the regression coefficients for nationality changed strongly after introducing these variables into the final model. Mastery of the language (Cuellar Scale, Deyo Scale) and the duration of residence in a country have been used in different studies to measure immigrant populations' degree of acculturation—in relation to their culture of origin—and integration into the culture of the host country (Cuellar,

11

Harris, & Jasso, 1980; Deyo, Diehl, Hazuda, & Stern, 1985; Van Der Stuyft, De Muynck, Schillemans, & Timmerman, 1989). The phenomenon of acculturation and its links with health and health-behaviors has been described a number of times (Clark & Hofsess, 1998; Jusot, et al., 2009). Two studies that examined the link between acculturation and HIV testing uptake found that a high degree of acculturation (in relation to the culture of origin) was associated with a greater likelihood of being tested (Do et al., 2005; Kinsler et al., 2009). This observation is consistent with our results concerning men, as the proportion of individuals tested increased with the amount of time lived in France and with the fact of not having difficulty reading/writing French.

Finally, as we mentioned in the methods section, using the nationality at the time of the survey may have introduced some classification biases in term of migration origin. Indeed, some French people may be immigrants who acquired the French citizenship (in 2004, 9.6% of the adult population in France are foreign-born abroad and 41% of them has then get the French citizenship) and, inversely, some French-born people may have been born and lived abroad before migration in France (Borrel & Durr, 2005). Such biases lead to an underestimation of differences between migration groups, especially among migrant women because they are more numerous to get French citizenship than migrant men (Fougère & Safi, 2007).

Our study tends to show good testing uptake in people of sub-Saharan African origin, who have been strongly targeted by prevention campaigns since 2003. Indeed, these individuals have both undergone more tests and have been tested more recently than those of French nationality. This finding is consistent with recent data on testing late presentation at testing (i.e. when already at Aids stage), which showed that it was less frequent in Africans (14%) than in native-born French (19%) among individuals who were diagnosed in 2006 (InVS, 2008). Concurrently, these data suggest that the French policies - which have focused

12

on high risk groups (Sub-Saharan migrants as mentioned above, but also men who have sex with men and intravenous drug users) - might have missed opportunities to raise the awareness of French heterosexuals and other lower-risk groups. As a result, when infected with HIV, these populations are then at higher risk of being tested late (Delpierre, et al., 2006).

France has recently adopted a new national strategy for the prevention and control of Aids for the years 2010-2014 (Ministère de la Santé, 2010). It recommends the universal screening of the general population with specific targets to the most vulnerable populations, which are not only the ones at higher risk of infection, but also those who may stay away from the existing screening services. It would be meaningful to repeat our analysis in the future in order to evaluate the consequences of this new screening policy.

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TABLES

Table 1: Proportion of people tested by sex (weighted data).

People tested	Men				Women			
	n	%	95% CI	p	n	%	95% CI	P
Total (n=1673)	730	51.32	[47.15,55.48]		943	58.94	[54.94,62.82]	
Age								
18-29 years	144	41.96	[33.73,50.67]	<0.0001	238	65.24	[57.83,71.98]	<0.0001
30-44 years	319	70.84	[65.81,75.41]		389	82.87	[78.66,86.39]	
45-59 years	189	53.61	[45.43,61.61]		210	58.00	[52.24,63.55]	
60 and over	78	28.20	[23.03,34.02]		106	26.29	[21.26,32.03]	
Number of steady relationships								
0	118	35.31	[29.82,41.21]	<0.0001	107	35.07	[29.24,41.38]	<0.0001
1	396	50.33	[45.19,55.46]		612	61.24	[57.44,64.91]	
2	143	67.95	[59.60,75.29]		159	73.97	[67.12,79.82]	
3 or more	74	79.67	[68.86,87.41]		65	80.91	[72.41,87.25]	
Birth after 1990								
No	428	45.27	[40.15,50.48]	<0.0001	466	44.79	[40.02,49.66]	<0.0001
Yes	303	63.29	[58.55,67.79]		478	85.18	[80.98,88.59]	
Belonging to an ethnic or religious community								
Yes	133	36.59	[30.78,42.82]	<0.0001	288	56.87	[50.86,62.69]	0.21
No	596	56.45	[51.92,60.88]		655	60.09	[56.25,63.80]	
Feeling at risk of contracting HIV								
Yes	170	63.35	[54.91,71.05]	<0.001	141	62.09	[54.88,68.80]	0.29
No	560	48.52	[44.38,52.69]		803	58.42	[54.30,62.43]	
Socio-occupational categories								
Never employed	47	39.88	[27.30,53.96]	<0.01	100	47.51	[38.64,56.53]	<0.01
Worker	130	41.93	[35.29,48.87]		35	53.05	[42.48,63.36]	
Employee	85	46.38	[36.60,56.45]		305	56.80	[51.81,61.66]	
Craftsmen/shopkeepers	48	50.03	[37.44,62.62]		24	53.97	[34.77,72.06]	
Intermediary position	147	56.80	[45.79,67.17]		259	63.66	[57.69,69.24]	
Executive/management	272	59.84	[52.81,66.50]		220	65.59	[57.33,73.00]	
Nationality								
French	631	53.30	[48.67,57.88]	0.03	781	58.77	[54.42,62.99]	<0.0001
Sub-Saharan African	27	58.71	[36.44,77.91]		57	93.22	[85.35,97.01]	
Northwest African	28	35.53	[24.56,48.27]		31	44.45	[33.36,56.12]	
Other	45	38.83	[26.54,52.71]		75	52.89	[42.41,63.11]	
Time lived in France								
0-4 years	17	40.82	[24.48,59.47]	0.62	29	68.93	[48.32,84.03]	0.04
5-9 years	15	48.53	[30.68,66.76]		63	77.40	[59.43,88.90]	
10-14 years	27	49.13	[33.68,64.76]		28	67.20	[48.10,81.91]	
15 or more years	672	51.81	[47.56,56.03]		822	57.35	[53.04,61.55]	
Difficulty reading/writing French								
Yes	60	33.18	[25.59,41.77]	<0.0001	90	50.24	[40.95,59.51]	0.06
No	670	53.97	[49.63,58.25]		854	60.03	[55.75,64.16]	

Table 2: Mean time since the last HIV test (in years) and univariate ANOVA analysis by sex.

	Men (n=584)		ANOVA (univariate)			Women (n=1058)		ANOVA (univariate)		
	Mean (years)	95% CI	F	df	Prob. >F	Mean (years)	95% CI	F	df	Prob. >F
Total (n=1642)	4.59	[4.03,5.15]				4.58	[4.08,5.08]			
Age										
18-29 years	1.92	[1.41,2.42]	11.12	3	<0.0001	1.52	[1.16,1.89]	72.64	3	<0.0001
30-44 years	5.50	[4.66,6.34]				4.09	[3.36,4.82]			
45-59 years	5.03	[4.01,6.04]				7.40	[6.67,8.14]			
60 and over	4.85	[3.93,5.77]				7.86	[6.88,8.85]			
Number of steady relationships										
0	2.88	[2.10,3.66]	2.82	3	0.04	3.46	[2.63,4.28]	1.19	3	0.31
1	5.02	[4.09,5.95]				4.69	[4.03,5.35]			
2	4.58	[3.72,5.45]				4.89	[4.04,5.74]			
3 or more	5.11	[3.67,6.55]				4.63	[2.94,6.32]			
Birth after 1990										
No	3.71	[3.26,4.16]	14.79	1	0.0001	5.19	[4.46,5.92]	18.76	1	<0.0001
Yes	5.87	[4.83,6.90]				4.00	[3.54,4.47]			
Belonging to an ethnic or religious community										
Yes	4.50	[3.65,5.34]	2	1	0.16	4.48	[3.66,5.30]	0.41	1	0.52
No	4.62	[4.03,5.22]				4.63	[4.14,5.11]			
Feeling at risk of contracting HIV										
Yes	4.32	[4.05,5.30]	0.05	1	0.82	4.69	[4.21,5.17]	5.47	1	0.02
No	4.67	[3.36,5.29]				3.92	[2.94,4.90]			
Socio-occupational categories										
Never employed	2.01	[1.02,2.99]	3.64	5	<0.01	1.85	[1.28,2.43]	8.01	5	<0.0001
Worker	4.78	[3.69,5.86]				3.20	[1.90,4.50]			
Employee	2.97	[2.15,3.79]				4.60	[3.82,5.38]			
Craftsmen/shopkeepers	6.05	[3.61,8.49]				6.40	[4.12,8.67]			
Intermediary position	4.94	[4.22,5.66]				4.77	[3.89,5.65]			
Executive/management	5.03	[4.16,5.91]				5.62	[4.68,6.57]			
Nationality										
French	4.76	[4.12,5.41]	4.12	3	<0.01	4.90	[4.35,5.46]	8.95	3	<0.0001
Sub-Saharan African	3.26	[1.15,5.38]				1.66	[0.95,2.37]			
Northwest African	2.28	[1.03,3.53]				2.74	[1.69,3.79]			
Other	3.53	[2.78,5.92]				4.26	[3.21,5.32]			
Time lived in France										
0-4 years	1.88	[0.00,3.97]	3.78	3	0.01	0.90	[0.41,1.39]	10.67	3	<0.0001
5-9 years	2.87	[1.38,4.36]				2.44	[1.74,3.14]			

10-14 years	3.06	[2.24,3.88]				3.53	[2.11,4.95]			
15 or more years	4.76	[4.15,5.38]				4.92	[4.38,5.46]			
Difficulty reading/writing French										
Yes	3.19	[2.19,4.19]	5.28	1	0.02	3.37	[2.38,4.35]	2.84	1	0.09
No	4.72	[4.12,5.31]				4.71	[2.38,4.35]			

Table 3: Factors associated with the duration since last HIV testing (in years) among men as determined by multilevel linear regression and multivariate anova analysis, taken into account the time lived in France and the difficulties mastering French (model 2) or not (model 1).

MEN	Model 1				Model 2			
	coef.(95CI)	Mean Square	F	p	coef.(95CI)	Mean Square	F	p
Model		88.62	4.46	<0.01		74.43	3.75	<0.01
Age								
18-29 years	Ref.	126.04	6.34	<0.01	Ref.	116.05	5.84	<0.01
30-44 years	2.10(0.88,3.33)**				2.07(0.84,3.30)**			
45-59 years	2.48(1.24,3.72)**				2.35(1.10,3.60)**			
60 and over	2.75(1.30,4.19)**				2.69(1.23,4.14)**			
Number of steady relationships								
0	Ref.	5.93	0.30	0.83		5.47	0.28	0.84
1	0.35(-0.70,1.40)				0.35(-0.70,1.40)			
2	-0.06(-1.29,1.18)				-0.05(-1.28,1.19)			
3 or more	0.08(-1.35,1.50)				0.16(-1.27,1.60)			
Birth after 1990								
No	Ref.	169.49	8.52	<0.01		191.24	9.62	<0.01
Yes	1.30(0.43,2.18)**				1.39(0.51,2.27)**			
Socio-occupational categories								
Never employed	Ref.	22.39	1.13	0.35		20.19	1.02	0.41
Worker	0.27(-1.72-2.26)				0.31(-1.72,2.33)			
Employee	-0.64(-2.69-1.41)				-0.64(-2.70,1.43)			
Intermediary position	0.22(-1.78-2.23)				0.14(-1.88,2.17)			
Executive/management	0.66(-1.29-2.62)				0.6(-1.37,2.58)			
Craftsmen/shopkeepers	1.01(-1.41-3.44)				0.91(-1.53,3.34)			
Nationality								
French		91.24	4.59	<0.01		40.18	2.02	0.11
Sub-Saharan African	-2.48(-4.15,-0.82)**				-1.88(-3.68,-0.07)*			
Northwest African	-2.13(-3.93,-0.33)*				-1.66(-3.54,0.22)			
Other	-1.15(-2.73,0.44)				-0.57(-2.29,1.14)			
Time lived in France								
0-4 years						21.64	1.09	0.35

18

	Model 1 coef.(95%CI)	Mean square	F	p	Model 2 coef.(95%CI)	Mean square	F	p
5-9 years					-0.87(-4.13,2.40)			
10-14 years					-0.89(-3.85,2.07)			
15 or more years					0.55(-1.97,3.06)			
Difficulty reading/writing French								
Yes						16.91	0.85	0.36
No					-0.66(-2.05,0.74)			
Residual		19.88				19.87		
Total		21.65				21.65		

* p<0.05, ** p<0.01

Table 4: Factors associated with the duration since last HIV testing (in years) among women as determined by multilevel linear regression and multivariate anova analysis, taken into account the time lived in France and the difficulties mastering French (model 2) or not (model 1).

WOMEN	Model 1 coef.(95%CI)	Mean square	F	p	Model 2 coef.(95%CI)	Mean square	F	p
Model		338.35	16.9	<0.01		273.37	13.6	<0.01
Age								
18-29 years	Ref.	1062.80	52.9	<0.01	Ref.	986.00	49.2	<0.01
30-44 years	2.03(1.22,2.84)**				1.99(1.18,2.81)**			
45-59 years	4.99(4.11,5.88)**				4.86(3.96,5.75)**			
60 and over	5.54(4.43,6.65)**				5.43(4.32,6.55)**			
Number of steady relationships								
0	Ref.	26.04	1.3	0.27	Ref.	27.42	1.4	0.25
1	0.59(-0.28,1.46)				0.61(-0.27,1.48)			
2	0.38(-0.66,1.40)				0.38(-0.66,1.41)			
3 or more	-0.29(-1.53,0.95)				-0.30(-1.54,0.94)			
Birth after 1990								
No	Ref.	0.00	0.0	0.99	Ref.	0.33	0.0	0.90
Yes	0.00(-0.69,0.68)				-0.04(-0.73,0.64)			
Socio-occupational categories								
Never employed	Ref.	52.20	2.6	0.02	Ref.	55.02	2.8	0.02
Worker	-0.64(-2.24,0.95)				-0.79(-2.40,0.82)			
Employee	1.17(0.06,2.29)*				1.17(0.04,2.29)*			
Intermediary position	0.79(-0.38,1.96)				0.79(-0.39,1.97)			
Executive/management	1.39(0.16,2.62)*				1.41(0.16,2.65)*			
Craftsmen/shopkeepers	1.03(-1.10,3.15)				1.09(-1.04,3.22)			
Nationality								
French	Ref.	68.75	3.4	0.02	Ref.	55.58	2.8	0.04
Sub-Saharan African	-1.70(-2.94,-0.46)**				-1.40(-2.75,-0.04)*			

19

Northwest African	-1.12(-2.54,0.29)		-0.96(-2.42,0.51)			
Other	0.41(-0.64,1.46)		0.65(-0.53,1.83)			
Time lived in France						
0-4 years			Ref.	36.71	1.8	0.14
5-9 years			1.59(-0.47,3.65)			
10-14 years			1.21(-1.08,3.49)			
15 or more years			2.08(0.20,3.96)*			
Difficulty reading/writing French						
Yes			Ref.	22.42	1.1	0.29
No			0.56(-0.48,1.60)			
Residual		20.08		20.04		
Total		24.59		24.59		

* p<0.05, ** p<0.01