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ORIGINAL ARTICLES

Surveillance report

PRELIMINARY RESULTS FROM THE NEW HIV SURVEILLANCE SYSTEM IN FRANCE

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In addition to AIDS surveillance, data on HIV infection are necessary to better follow the dynamics of the epidemic. We report the first results of France's mandatory anonymous HIV notification system, which is linked to a virological surveillance of recent HIV infections and of circulating HIV types, groups and subtypes.

HIV notifications are initiated by microbiologists who create an anonymous code of patient's identity. Clinicians complete the notification form with epidemiological and clinical data. Notifications are sent to the local health authorities and passed to the Institut de Veille Sanitaire (InVS).

Laboratories voluntarily send sera from newly diagnosed HIV infected persons on dried blood spots to the national HIV reference laboratory where an immunoassay for recent infection (<6 months) and a serotyping assay for the determination of group and subtype are done. The virological results are then merged at the InVS with the information from the mandatory reporting.

Of the first 1301 new HIV diagnoses reported in 2003, 43% were in women, and overall, 53% were in heterosexuals, of whom 47% were of sub-Saharan African origin. MSM accounted for 36% of male notifications.

A dried blood spot was available for 64% of new HIV diagnoses. Evidence of recent infection was found for 38%, ranging from 22% in IDUs to 58% in MSM. Twenty-six per cent of infections in sub-Saharan migrants were recent infections. HIV-1 accounted for 98% of all notifications: 48% of these were non-B subtypes. The first results of the HIV notification system indicate that heterosexual transmission is the predominant mode of transmission and that persons originating from sub-Saharan Africa are particularly affected. Over half of infections shown to be recently acquired were in MSM; this may indicate an increased HIV incidence in this population.

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Introduction

The mandatory reporting system for AIDS has existed in France since 1986. The creation of a surveillance system for HIV infection has for many years been a public health objective in order to better follow the dynamics of the epidemic. The Institut de Veille Sanitaire (InVS) worked at length with representatives of civil society, public health professionals, patients' associations, and the French data protection authority to design a comprehensive surveillance system that would be respectful of patients' rights. This system was implemented in March 2003, and, in common with many other European countries, France now has its own mandatory reporting system for HIV [1,2].

Together with the new mandatory reporting system for HIV, virological surveillance of 'recent' HIV infections and of circulating subtypes was created in order to contribute to estimating HIV incidence.

This article aims to present the preliminary results (data from March to September 2003) of these new surveillance systems [3].

Methods

Mandatory reporting of HIV

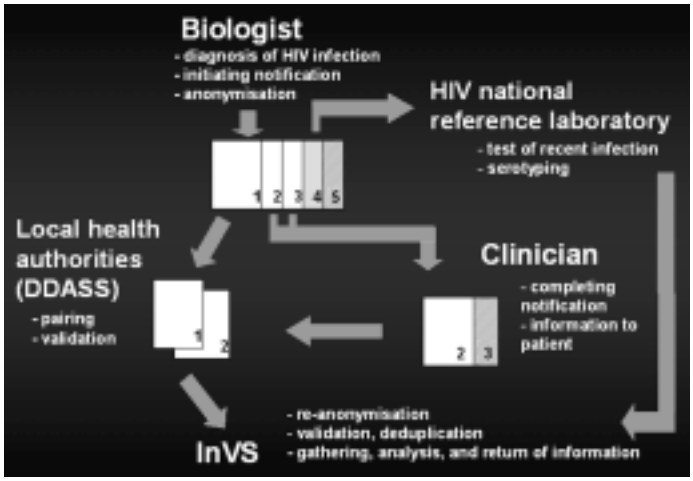
Any HIV positive serology confirmed for the first time by a microbiological laboratory must be notified, with the exception of diagnoses made at anonymous and voluntary counselling/testing sites. There are around 4500 microbiological laboratories in France.

HIV mandatory notifications are initiated by microbiologists who use software provided by the InVS to create a unique and irreversible anonymous code for each person, using date of birth, first name, initial of last name, and sex [FIGURE 1]. Some epidemiological and clinical details (occupation, nationality, reason for testing, prior negative or positive serology, clinical stage, mode of exposure) are then supplied by clinicians.

Notifications are sent to the local health authorities (Directions Départementales des Affaires Sanitaires et Sociales, DDASS), and passed on to the InVS where a second anonymous code, also unique and irreversible, is generated. Those codes allow the detection of duplicates so that the same person cannot be registered twice, and also link notifications for HIV, AIDS and deaths.

FIGURE 1

Notification of HIV infection in France



Virological surveillance

Virological surveillance is conducted to determine the virus type (HIV-1 or HIV-2) among the HIV infection diagnoses, and for the HIV-1 diagnoses, the group, the subtype, and whether or not infection occurred recently (£ 6 months), with the help of an immunoassay for recent infection based on the detection of antibodies towards two antigens (the immunodominant epitope of gp41 (IDE) and V3 peptide) [4]. This assay , developed by the National HIV Reference Laboratory (Centre national de référence du VIH, CNR VIH, Tours,), was validated on a population of HIV-infected patients for whom probable time of infection was known. Excluding new HIV diagnoses in patients who present with AIDS, the assay sensitivity was estimated to be 87% and specificity 98% on dried blood spots (F Barin, personal communication).

All the virological tests were performed by the National HIV Reference Laboratory from a dried blood spot collected by microbiologists from the stored blood sample that allowed the original diagnosis of HIV infection. Virological results are then sent to InVS where they are linked to the information from the mandatory reporting.

Patient consent to virological surveillance is obtained by the reporting clinician.

For this article, complete HIV notification forms received at the InVS between March and 30 September 2003 have been analysed (microbiologist and clinician information) for new diagnoses only (positive serology diagnosed and notified in 2003, without any mention of prior positive serology, unless the prior positive test first occurred within the 12 preceding months).

Results

Mandatory notification of HIV

Between March and 30 September 2003, 1301 new diagnoses of HIV infection were reported to the InVS.

Sex and age

The proportion of women was 43%. The mean age at the time of the diagnosis of HIV infection was 37 years for all cases. It was lower in women than in men (33.6 years versus 39.4 years; $p<10^{-4}$).

Mode of infection and nationality

Over half of the new diagnoses of HIV infection in 2003 concerned individuals who were infected by heterosexual transmission, and 21% (27% if the unknown group is excluded) by homosexual transmission. Transmission by injecting drug use represents only 3% (4% if the unknown group is excluded) of the new diagnoses [TABLE 1].

TABLE 1

New diagnoses of HIV infection in 2003 according to the route of transmission and sex, France, 30 September 2003

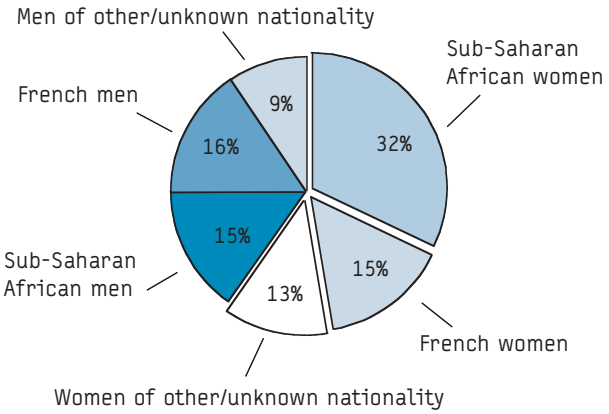
Mode of infection	Sex					
	Women		Men		Total*	
	n	(%)	n	(%)	n	(%)
Homosexual intercourse	0	0.0%	269	36.0%	269	20.7%
Heterosexual intercourse	412	74.4%	278	37.2%	690	53.0%
Injecting drug use	7	1.2%	30	4.0%	37	2.8%
Other*, unknown	135	24.4%	170	22.8%	305	23.4%
Total	554	100%	747	100%	1301	100%

* for 8 cases whose route of transmission was other than those mentionned above

Of the 690 people infected through heterosexual transmission, 60% were women, 47% were nationals from a sub-Saharan African country (mainly Cameroon, Ivory Coast, Congo and Democratic Republic of Congo) and 31% were nationals from France [FIGURE 2].

FIGURE 2

Distribution of persons infected through heterosexual intercourse according to sex and nationality (n=690), France, 30 September 2003



Clinical stage

The majority of new diagnoses of HIV infection in 2003 were asymptomatic (53%), 15% were at a non-AIDS symptomatic stage, 12% had AIDS and 8% were early diagnoses at primary infection stage. The clinical stage was not documented for 12% of notifications.

The clinical stage at the time of diagnosis of HIV infection varied depending on the mode of transmission. Men who have sex with men (MSM) were more often diagnosed during primary infection (22%) than were heterosexuals (5%), and heterosexuals more often were diagnosed at an asymptomatic stage (61%) than were MSM (48%).

Virological surveillance

The proportion of patients who refused virological surveillance was very low (5%). Consent was not documented in 16% of notification forms, however, and the dried blot spot was not carried out in 15% of cases.

Immunoassay for recent HIV infection

Results of assays for recent HIV infection were available for 839 patients (64%). The proportion of recent infections among new diagnoses in 2003 was 38.4% [CI 95%: 35.0 – 41.8]. This proportion varied significantly according to age, mode of infection and nationality [TABLE 2].

The proportion of recent infections was higher in those under 40 years of age, regardless of sex.

Over half (58%) of new diagnoses in MSM were recent infections,

TABLE 2

Proportion of recent infections among new HIV infection diagnoses, France, 30 September 2003

	Recent infections			p*
	N	%	CI 95%]	
Sex				*NS*
Men	192	39.8	[35.5 - 44.4]	
Women	130	36.4	[31.5 - 41.7]	
Age group				*0.04*
< 30 years	96	42.1	[35.7 - 48.8]	
30-39 years	128	41.6	[36.0 - 47.3]	
40-49 years	65	34.6	[27.9 - 41.9]	
> = 50 years	33	28.7	[20.8 - 38.0]	
Mode of infection				*0.0001*
Homosexual intercourse	111	58.1	[50.8 - 65.2]	
Heterosexual intercourse	156	32.2	[28.1 - 36.6]	
Injecting drugs	4	22.2	[7.4 - 48.1]	
Other/Unknown	51	34.9	[27.4 - 43.3]	
Nationality				*0.0001*
France	182	48.9	[43.7 - 54.1]	
Europe (excluding France)	5	41.7	[16.5 - 71.4]	
Sub-Saharan Africa	71	26.0	[21.0 - 31.7]	
North Africa	1	7.1	[0.4 - 35.8]	
Other/Unknown	63	37.5	[30.3 - 45.3]	

* X^2 test

as were nearly one third (32%) of those infected through heterosexual intercourse. In injecting drug users (IDUs), the number of patients recently infected was lower (4/18).

Generally speaking, the proportion of recent infections among sub-Saharan Africans was lower than in French persons (26% versus 50%). Similarly, in sub-Saharan African heterosexuals, the proportion of recent infections was lower than in French heterosexuals (26% versus 44%).

In French patients infected through heterosexual transmission, the proportion of recent infections was higher in women than in men (52% versus 35%, p=0.03).

Serotyping

It was possible to determine the virus type for 1019 individuals newly diagnosed in 2003, by the National Reference Laboratory and/or by the biologist. The proportion of HIV-2 was 3.1% [2.2-4.4], of which 2.1% [1.3-3.1] was HIV-2 infection alone and 1.1% [0.6-2.0] was probable co-infection of HIV-1/HIV-2 .

Among HIV-1 infections, the group was known for 748 cases. Infections by group O virus represented 0.3% (2/748). Within group M (n=746), it was possible to determine the subtype for only 41 cases. Among cases that were subtyped, 52% [48.4-55.9] were B subtypes and 48% [44.1-51.6] were non-B subtypes.

The rates of B and non-B subtypes varied significantly according to sex, age, mode of infection and nationality, but not according to whether the infection was recent or not.

The proportion of non-B subtypes was higher in men than in women (54% versus 45%), and in those under 40 compared to those over 40 (54% versus 36%), and in heterosexuals compared to MSM or IDUs (58% versus 13%).

The proportion of non-B infections was 19% in French patients, whereas it reached 82% in sub-Saharan African patients.

Discussion

Compared with AIDS surveillance as it was performed until the beginning of 2003, the novelty of this HIV surveillance system integrated with the AIDS surveillance system is the involvement of private practitioners and microbiologists (30% of notifications were initiated by private microbiologists and 24% were completed by private practitioners) and the use of a double anonymous code allowing a maximal protection of the patients' confidentiality. The experience of 2003 shows that the system has worked well, despite the high numbers of reporting health professionals involved. Nevertheless, the management of notification forms was complicated, due to the measures implemented to protect confidentiality. A formal review of the system is planned for the end of 2004.

Considering the progressive increase of the system's activity and the notification delays, the number of new HIV diagnoses reported between March and September 2003 underestimates the real number of diagnoses during this period.

One of the novelties of this surveillance system is the use of a assay for recent HIV infection. The period of time that defines a recent infection (6 months) can appear to be short in a surveillance context, but this is due to the technical constraints of the assay. Some tests of recent HIV infection based on a 'sensitive HIV enzyme immunoassay' (such as Organon Teknica Vironostica) have also been used in other countries, in a sentinel surveillance context in the United States, and for a pilot project in Canada (unpublished data). The global overall percentage of recent infections observed in France during the first months of surveillance (38.4%) was higher than present one observed in those two countries (United States: 19.2% [182/949] and Canada: 25.8% [122/472]). It could be explained by differences in screening practices policy between these countries, but also by methodological differences (time when the assay was performed, compared with the time of the original diagnosis of HIV, definition of the new HIV diagnoses)

In Europe, the Organon Teknica Vironostica test has been used in the United Kingdom and in Amsterdam in the Netherlands in MSM patients consulting for a sexually transmitted infection in order to estimate HIV incidence in this population [5,6].

In 2003, heterosexual intercourse represented the main mode of transmission in new diagnoses of HIV infection (53%) and also in AIDS cases (51%). The epidemic in heterosexuals largely affects the sub-Saharan African population, since nearly one in two hetero sexual cases originated from this part of the world. The increase of the proportion of sub-Saharan nationals Africans in the epidemic is a reflection of the enormous epidemic underway in Africa and of France's historical links with some of the countries in this continent. The United Kingdom and Belgium are experiencing a similar situation: in 2002-2003, over 70% of HIV infections in heterosexuals in those two countries occurred in people originating from a region where HIV prevalence was high [7].

The proportion of recent infections was lower in the heterosexual population from sub-Saharan Africa than in the French population (26% versus 44%). This could be explained by Africans' poorer access to testing , both in their country of origin and in France, and therefore a lower probability of being diagnosed during the months immediately following infection. Testing and care of these sub-Saharan African populations, often living in precarious circumstances, must be reinforced [8].

The decrease in the number of AIDS cases in IDUs and the low proportion of IDUs in new HIV diagnoses (3%) in 2003 confirms the reduction of HIV transmission in this population. A large proportion of HIV-positive injecting drug users was tested early, long before reaching the AIDS stage.

The epidemic is stable in men infected through homosexual transmission, and MSM represent an important group among the new diagnoses of HIV infection (21%), and 27% of AIDS cases in 2003. The proportion of recent infections was highest in this group (58%). This could reflect the behaviour relapse observed in recent years in this population [9]. This number must, however, be interpreted carefully as it is highly dependent on screening practices: MSM test for HIV more frequently than other groups at risk, and so the probability of being screened shortly after infection is higher (87% of MSM versus 36% of all men have been tested for HIV at least once in their lifetime) [9,10].

The proportion of HIV-2 among new diagnoses of HIV infection

in 2003 (3.1%) is high compared with that observed in other populations [11]. The proportion of non-B subtypes (45%) is also higher than the one observed in previous studies: 33% in 2001 [12] or 16% over the period 1996-1998 [13]. Non-B subtypes affect mainly sub-Saharan African patients, and this is consistent with the predominance of those subtypes on the African continent. The high proportion of non-B subtypes (19%) in French HIV infected patients (including those recently infected) suggests that the non-B subtype is also in circulation in the French population, particularly in heterosexuals.

Conclusion

The mandatory notification of HIV and AIDS, together with virological surveillance of recent infections, has greatly improved HIV surveillance in France in 2003.

First results suggest that heterosexual transmission is the predominant mode of transmission in France, particularly in the sub-Saharan African population. HIV transmission appeared to be particularly active in the MSM population in 2003. In contrast, infections linked to injecting drug use are less frequent. Non-B subtypes circulate widely in France.

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ORIGINAL ARTICLES

Surveillance report

SURVEILLANCE OF INVASIVE MENINGOCOCCAL DISEASE IN THE CZECH REPUBLIC

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Routine notification of invasive meningococcal disease has a long tradition in the Czech Republic: mortality data are available from 1921 and morbidity data from 1943. The collection of *Neisseria meningitidis* strains kept in the NRL for Meningococcal Infections in Prague dates from 1970 onwards, and represents more than 3500 strains isolated from invasive disease and their contacts, from healthy carriers and from respiratory infection. Analysis of these strains showed that the Czech meningococcal population is different from that seen in western Europe. In 1993, the incidence serogroup C meningococcal disease increased and was associated with the emergence of the hypervirulent complex *Neisseria meningitidis* C, ST-11, ET-15/37, and caused an increase in the incidence of invasive meningococcal disease which peaked in 1995 (2.2/100 000). A vaccination strategy targeting the part of the population at highest risk of invasive meningococcal disease was adopted in the country.

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Key words : Invasive meningococcal disease, active surveillance, clonal analysis, vaccination strategy, Czech Republic

Introduction

Invasive meningococcal disease is still one of the most serious infectious diseases, despite the availability of early antibiotic treatment and development of modern intensive care for the patients. Routine notification of invasive meningococcal disease has a long tradition in the Czech Republic: mortality data on the disease are available from 1921 and morbidity data from 1943 [1]. The National Reference Laboratory (NRL) for Meningococcal Infections in the National Institute of Public Health (NIPH) in Prague has been dealing with this disease since the 1970s using a multidiscipline approach to the study of the causative agent and host factors. Thanks to long and detailed monitoring of the disease and the causative agent, a new clone of *Neisseria meningitidis,* C:2a:P1.2(5), ET-15/37, ST-11, was rapidly recognised when it emerged in 1993 [2]. This hypervirulent complex was responsible for a marked increase in invasive meningococcal disease in the country: with substantial morbidity and mortality. Facing this situation, the NRL for Meningococcal Infections has implemented an enhanced surveillance of invasive meningococcal