

The monitoring of HIV diagnosis in Catalonia forms part of the epidemiologic surveillance of HIV/AIDS maintained since 1992, and is based on data from different information sources such as the voluntary notifications of a network of laboratories from the whole of Catalonia (HIV-LABCAT), the information collected from centres which offer the HIV test along with counselling (HIVDEVO project), the Register of AIDS cases, the system of voluntary reporting of new HIV diagnoses and also on the data collected on more specific projects [1] (figure 4.1).

The main objectives of this monitoring are to:

- Describe the activity of the centres which perform the HIV antibody test.
- Describe the epidemiologic pattern both in those people who take the test and in those who test HIV-positive.
- Estimate the extent of diagnosis in vulnerable groups.
- Estimate the delay in the diagnosis of HIV infection.

4.1. Monitoring through laboratory declarations

In 1992 a network of laboratories was created in Catalonia which voluntarily notifies the performing of HIV tests and the results obtained. Currently, this network is made up of hospital laboratories, Primary Healthcare Centre laboratories and

private laboratories (HIVLABCAT). These all send a monthly report to CEEISCAT communicating both the number of HIV tests performed and the quantity of new diagnoses (excluding the screening tests performed on donated blood).

The number of diagnostic tests reported during 2008 for each 1,000

inhabitants of Catalonia was 39.8, oscillating between 16.5 registered in the Central Catalan Health Region and 53.6 registered in the Lleida Health Region (figure 4.1.1). In table 4.1.1 we can compare the number of HIV tests performed per each 1,000 inhabitants of Catalonia with those performed in other EU countries [2]. We see that the rate of tests

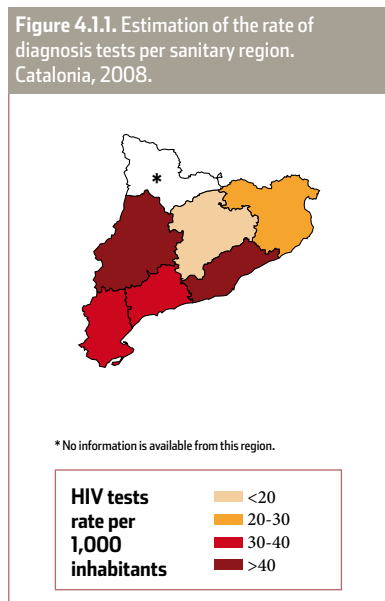
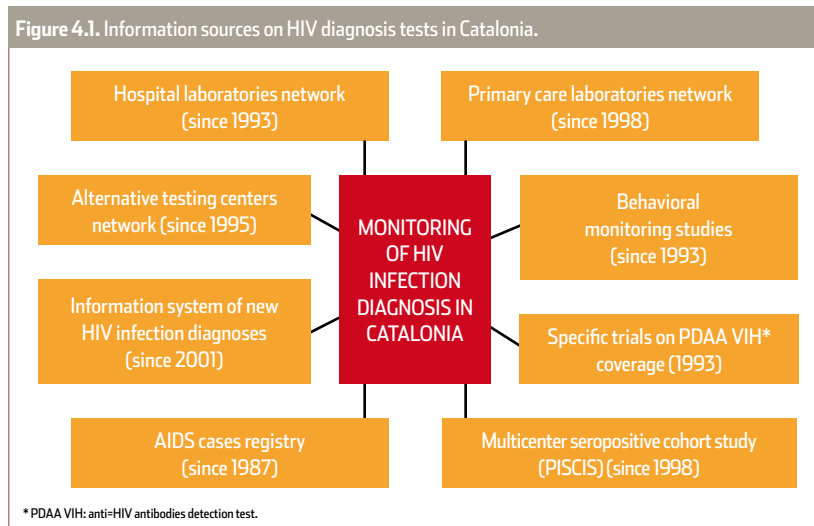


Table 4.1.1. Number of anti-HIV tests carried out per 1,000 inhabitants in European countries, 2008.

Country EU	Tests/1,000 inhabitants
Austria	90.4
France	78.1
Belgium	58.1
Estonia	55.5
Cyprus	53.6
Lithuania	48.2
Catalonia	39.8
Czech Republic	33.0
Slovakia	30.9
Luxemburg	27.6
Slovenia	15.5
Hungary	8.3
Poland	5.1

Source: HIV/AIDS Surveillance in Europe, 2008.

Figure 4.1.2. Number of HIV diagnosis tests carried out and rate of positive results. Catalonia laboratories network, 1993-2008.

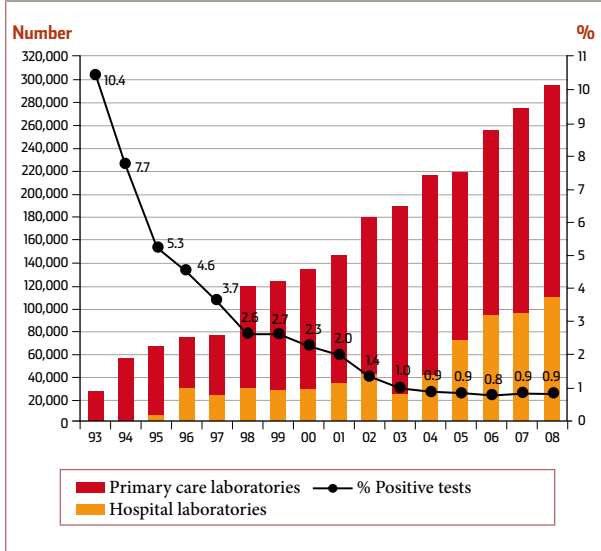
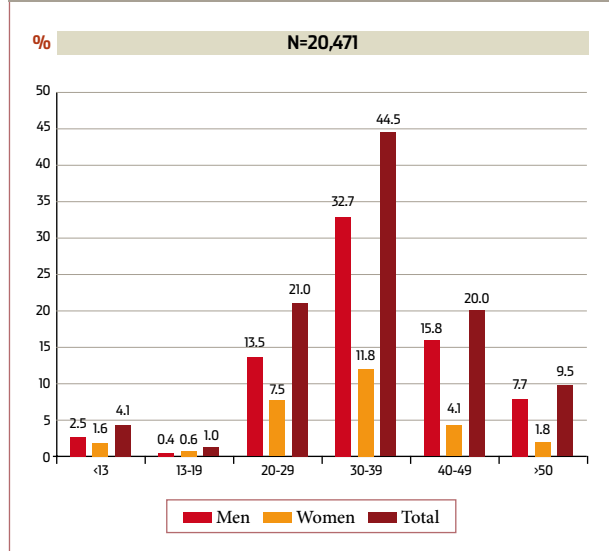


Figure 4.1.3. HIV positive tests rate per sex and age group. Catalonia laboratories network, 1997-2008.



in Catalonia is still much lower than in countries such as Austria and France which have rates of 90.4 and 78.1 respectively.

The annual number of tests performed and reported by the laboratories has been increasing progressively over the years, starting with 52,005 in the year in which the study was initiated, to 293,304 in 2008. In the last few years the increase has occurred, above all, in the tests performed in Primary Healthcare Centre laboratories. The percentage of tests with a positive result in this period (1992-2008) has been decreasing (figure 4.1.2), maintaining stable in the last few years (0.8 to 0.9%). The fact that the proportion of data which each laboratory provides is often significantly different, with reference to both the number of tests performed and the percentage of positive results must also be taken into account [3].

In order to be able to describe the characteristics of the people diagnosed with HIV infection, starting in 1997, each laboratory has collected the age and gender of the new diagnoses it has identified.

With regard to the new cases diagnosed in the period 1997-2008, 72.6% were men, and the most numerous group, both in men and women, is that aged between 30 and 39 years (figure 4.1.3).

4.2. Monitoring through anonymous HIV detection centres

Since 1994 those centres where people can take a voluntary HIV antibody test (HIVDEVO) have collected epidemiologic data from the people who make use of these services. In Catalonia, there are currently ten centres with these characteris-

tics which offer, along with counselling, voluntary HIV tests, which are free, anonymous and confidential. These centres are located in Barcelona (Citizens AIDS Association of Catalonia (ACASC, according to the Catalan acronym), Sexually and Contraception Youth Centre (CJAS, according to the Catalan acronym), BCN-Checkpoint, Prevention and treatment service for health and social care (SAPS, according to the Catalan acronym) Creu Roja, Stop Sida, Àmbit Prevenció and Gays Positius), Sabadell and Terrassa (Actúa Vallès), Lleida (Associació Antisida de Lleida) and Girona (Community AIDS Association of Catalonia (ACAS, according to the Catalan acronym) Girona). The test is funded by the DS of the Catalan government.

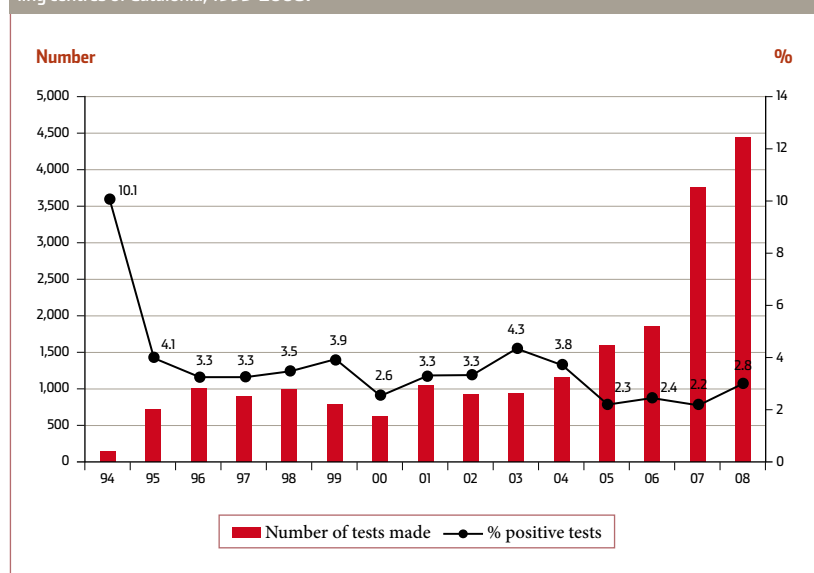
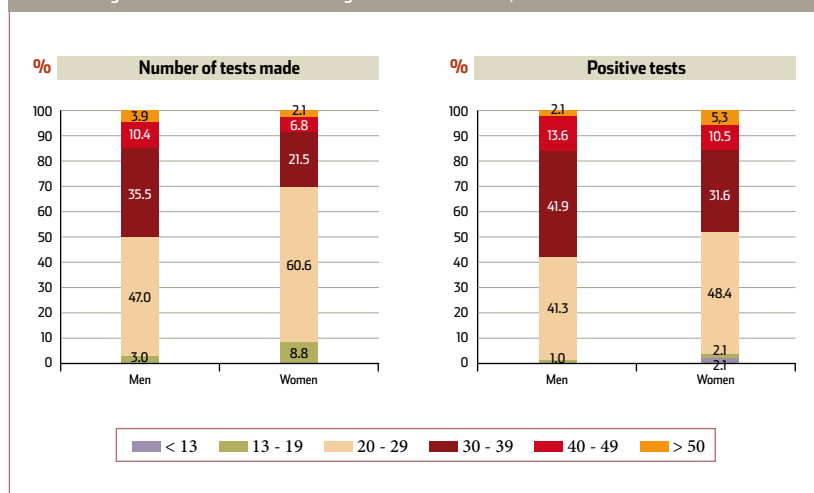
From the initiation of the project until 2008 20,817 tests were performed, with a prevalence of infec-

Table 4.2.1. Number of tests carried out, number of positive tests and positive rate. Diagnosis and assisted counselling centres of Catalonia, 2006-2008.

Year	Number of tests made	Positive tests	% positive tests
2006	1,849	45	2.4
2007	3,752	81	2.2
2008	4,431	126	2.8

Table 4.2.2. Number of anti-HIV tests carried out and positive rate per kind of test. Diagnosis and assisted counselling centres of Catalonia, 2007-2008.

	Kind of test	Number of tests made	% positive tests
2007	Standard test	382 (10.2%)	2.9
	Rapid test	3,345 (89.8%)	2
2008	Standard test	315 (7.2%)	1.9
	Rapid test	4,080 (92.8%)	2.8

Figure 4.2.1. Number of anti-HIV tests carried out and positive rate. Diagnosis and assisted counselling centres of Catalonia, 1995-2008.**Figure 4.2.2.** Percent of HIV diagnosis tests reported and percent of positives. Distribution per age and sex. Diagnosis and assisted counselling centres of Catalonia, 1995-2008.

tion of 3.0%. The yearly evolution of the number of tests performed in these centres was relatively small until 2006, oscillating between 716 performed in 1995 to 1,849 performed in 2006 (figure 4.2.1). At the end of 2006 the rapid HIV test was introduced into alternative diagnostic and counselling centres which increased the demand for the HIV test in these centres. On comparing the number of tests performed in 2007 with respect to those performed in 2006, an increase of 102.9% is seen [4]. The increase in the number of tests performed during 2008 is 18% with respect to 2007, and if this is compared with 2006, the increase is 139.6%. (table 4.2.1). Despite this increase in the number of tests performed, the percentage of positive tests detected has not varied significantly [5]. Over the years 2007 and 2008, the use of the standard test decreased considerably, in favour of the use of the rapid tests (table 4.2.2).

In the time period between 1994 and 2008, 65.3% of the people who took the test were men. Both in men and women, the group who took most tests were those aged between 20 and 29 years (figure 4.2.2). Amongst the positive group, the age groups ranging between 30 and 39 years in men and between 20 and 29 in women were largest (figure 4.2.2).

Figure 4.2.3. Changes in the distribution of tests and positive tests by risk group, 1995-2008.

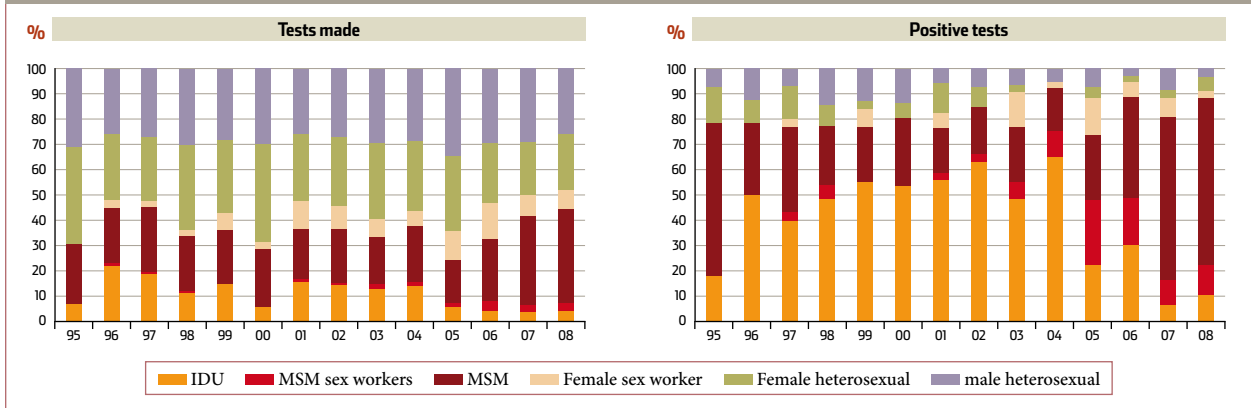


Figure 4.2.3 shows the evolution over time of the distribution of the percentage of tests performed and the positive results classified by transmission groups. The proportion of MSM who take the test in these centres has been increasing, and at the same time the proportion of IDUs has been decreasing. Regarding positive tests, from 1996 until 2004 the largest group was that of IDUs, but from 2005 the proportion of IDUs was decreasing and

that of MSM was increasing, reaching 78.6% of the total of positives detected in 2008 (66.6% MSM and 12.6% male SW). The transmission group with the highest percentage of positive results over the whole period was that of IDUs, followed by MSM, and the heterosexual group was the one which had the lowest percentage (figure 4.2.4).

With regard to the year 2008, 2.8% (126/4,431) of the tests performed

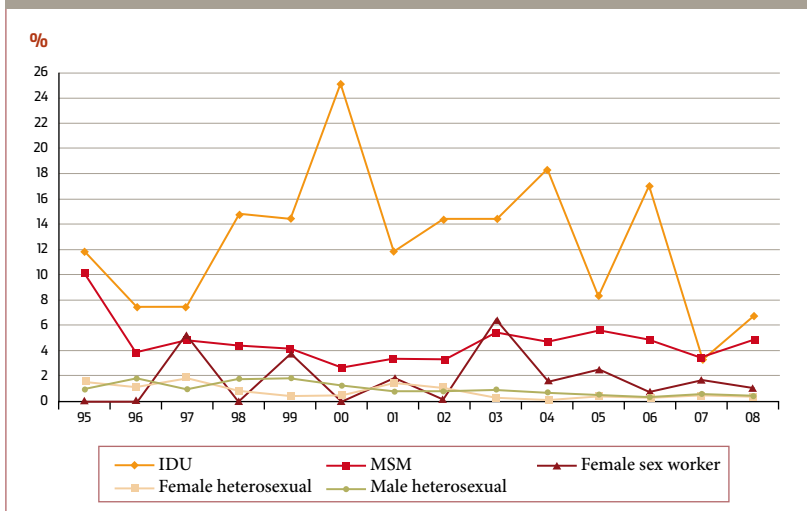
gave positive results. 63.8% had taken the test previously at least once. Of the total of positive cases, 60.8% had at least one previous test with a negative result. 34.7% of the tests were performed on people from other countries, and amongst the positive cases the percentage was 56.2%.

4.3. The extent of the HIV diagnostic test in special interest groups

This section presents the extent of the HIV diagnostic test in the following groups: pregnant women, IDUs, MSM and FSW (table 4.3.1).

With regard to the first group, in 2000 a transverse study was performed which included 2,230 women recruited after giving birth, in 9 public and 2 private hospitals [6]. Trained personnel interviewed the selected women personally and revised their medical histories. Data about the taking of the HIV test was collected from both sources of information. According to the result of

Figure 4.2.4. Annual evolution of the percentage of positive tests by risk group, 1995-2008.



the personal interview, 67% of the women stated that they had taken a HIV test during the pregnancy, whilst the percentage of tests taken collected from the revision of medical histories was 89%.

In the IDU group, 7 transverse studies were done with a biennial periodicity between 1993-2006 in IDUs recruited on the street, and during 2008 a study was initiated of a sample of IDUs recruited in harm reduction centres in Catalonia (for more details see chapter C). The proportion of IDUs who reported having taken the HIV test, at least once, increased starting from the second evaluation of the study, being at 89.1% in the evaluation of 2008. In this last study, between those who gave a positive result from the samples of oral fluid collected (n = 257), 26% did not know their HIV status at the time

of the interview (or indeed they either self-reported as being HIV-negative, or they had not taken the HIV test).

In the MSM group 7 biennial transverse studies have been carried out between 1993 and 2008. The participants were recruited in saunas, sex-shops, bars, public parks and also via the posting of a questionnaire to members of a gay community association. In the evaluation of 2008, the sample recruitment methodology was modified on its incorporation into a European study called SIALON (for more details, see chapter 3). In these studies, the proportion of men who had taken the HIV diagnostic test at least once increased from 61% in 1993 to 88% in 2006. In this last study, the total of MSM who gave a positive result from the samples of oral fluid collected (n = 65), 46.7% did not know their HIV status at the

time of the interview (either they self reported themselves as HIV-negative or they had not taken the HIV test). On the other hand, another study of MSM, in which behavioural information was collected via the Internet, showed that of the men living in Catalonia (n = 718), 73.1% reported having taken the HIV test on some occasion.

Finally, in 2005 the monitoring of behaviours in FSW was initiated in Catalonia, and during 2007 a second evaluation of the study was made. Of the 400 women recruited in each study, the majority were immigrants (89% and 86% in 2005 and 2007, respectively). The global prevalence of the taking of the HIV test in each study was approximately 85%. The immigrant women had taken the HIV test in less proportion than the women native to Catalonia (82.6% and 98.2% in 2007, respectively).

Table 4.3.1. Coverage of the diagnostic test in certain special interest groups. Catalonia, 1993-2008.

Groups	1993	1995-6	1998	2000	2002	2004	2005	2006	2007	2008
Pregnant women										
Diagnostic test for HIV during pregnancy (self-reported)										
Hospitals public	-	-	-	68	-	-		-		
Hospitals private	-	-	-	65	-	-		-		
Diagnostic test for HIV during pregnancy (case notes)										
Hospitals public	-	-	-	93.8	-	-		-		
Hospitals private	-	-	-	71.2	-	-		-		
IDU										
HIV diagnostic test ever	79	95	93	95	83	82		95		89.1
MSM										
HIV diagnostic test ever (SIALON)	61	67.1	75.5	78	82.6	81		86.6		88
HIV diagnostic test ever (Internet)										73.1
Female sex worker										
HIV diagnostic test ever							85.3		84.8	

4.4. Estimation of the delay in the diagnosis of HIV infection in Catalonia

The early diagnosis of HIV infection allows for the improvement of survivability of those affected and at the same time allows for the modification of behaviours which favour the transmission of the virus to other people [7]. To this end, in Catalonia, in the year 2000 CEEISCAT incorporated the estimation of delayed HIV diagnosis as another parameter in its continued epidemiologic surveillance of HIV.

To estimate the delay in the diagnosis of HIV infection, data originating from three information systems was used: the AIDS case register, the New HIV Infection Diagnoses of Catalonia Information System and the PISCIS project, a prospective observational study.

4.4.1. Aids case register

Delay in diagnosis is defined as when the AIDS diagnosis is given in a time period shorter or equal to twelve months after the HIV infection diagnosis.

In the AIDS case register, of the 16,235 cases reported during the period 1981 to 2008 both dates were known (HIV and AIDS diagnosis) in 15,334 cases; of these, 46.2% (7,506 cases) showed delayed diagnosis.

The proportion of cases of delayed diagnosis was higher in men (50.7%) compared to women (41.7%). Delayed diagnosis increased with age, being 44.9% in men younger than 35 years old, 47.7% in those aged between 35 and 49 years and 75.8% in those over 49 years old. Regarding routes of transmission, globally, sexual transmission showed a higher proportion of delayed diagnosis (65.4%), being 67.8% in heterosexuals and 65.2% in MSM.

Figure 4.4.1. Percentage of AIDS cases with late diagnosis per transmission group and period. Catalonia, 1981-2004.

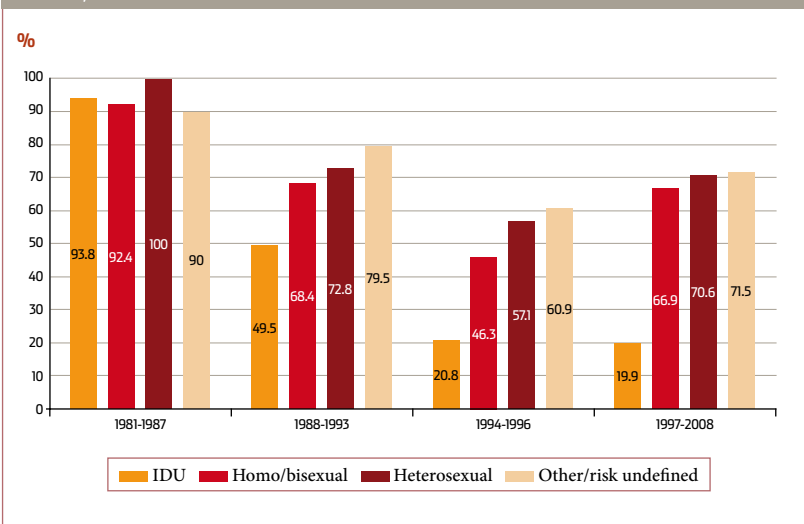


Figure 4.4.2. Characteristics late diagnosis in new cases of HIV infection. Catalonia, 2001-2008.

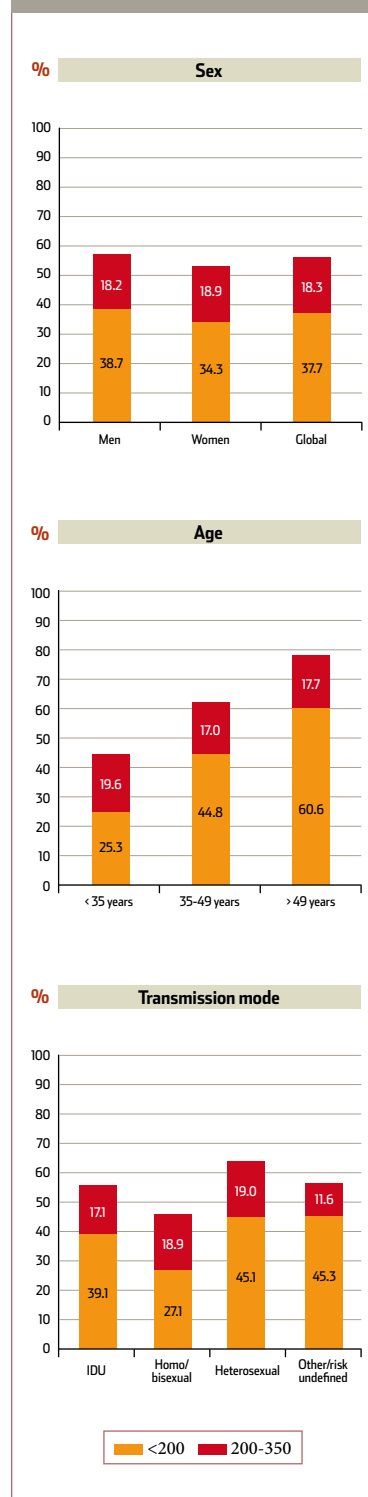


Figure 4.4.1 shows the distribution of delayed diagnosis according to transmission routes and is grouped into time periods.

4.4.2. Information system of new HIV infection diagnoses

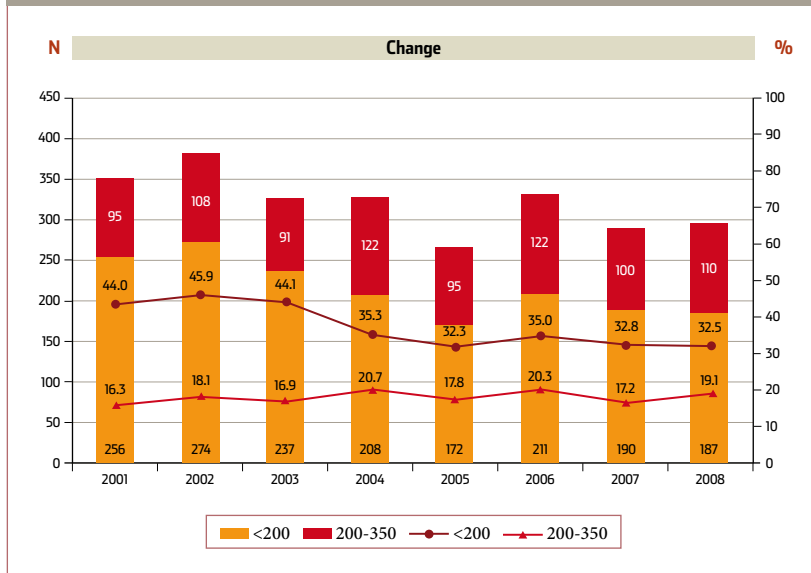
The delay in HIV diagnosis is defined as the presence of a number of CD4 lymphocytes closest to the diagnosis inferior to $200 \times 10^6/l$.

Along with this serious immunosuppression, the group with between 200 and 350 CD4s was monitored given its epidemiological importance and the possibility that the patients were in need of antiretroviral therapy (ART).

Of the 5,506 new diagnoses reported in the system of notification of new HIV infection diagnosis during the period 2001-2008, in 4,597 information about the CD4 lymphocyte count was recorded and of these, 37.7% (1,735) of the cases showed delayed diagnosis (CD4 <200). Also, 15.3% (843) had between 200 and 350 CD4s. Adding up these percentages. We can say that 56.1% of cases were already in need of ART at the time of their HIV diagnosis.

The proportion of late diagnosis was higher in men (38.7%) than in women (34.3%). The proportion of late diagnosis increased with age, being 25.3% in those younger than 35 years old, 44.8% amongst those aged between 35 and 49 and 60.6% in those aged over 49 years old. Regarding routes of transmission, there was a higher proportion of heterosexual

Figure 4.4.3. Changes in late diagnosis in new HIV infection diagnoses. Catalonia, 2001-2008.



cases of delayed diagnosis (45.1%) (figure 4.4.2).

With respect to the evolution of delayed diagnosis for the time period analyzed, a significant decrease ($p = 0,001$) from 44% in 2001 to 32.5% in 2008 was observed (figure 4.4.3).

4.4.3. Evidence of late diagnosis in the PISCIS cohort study

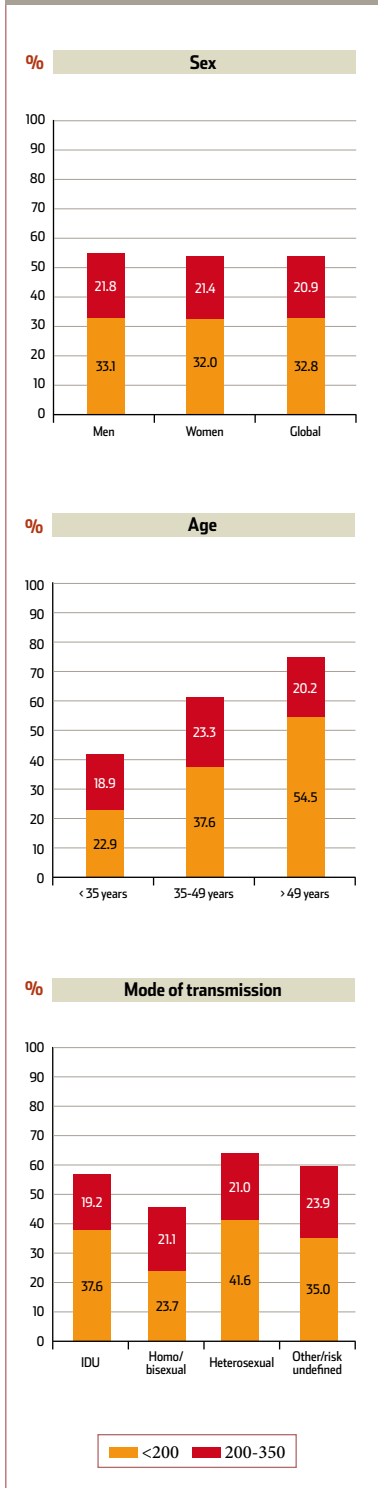
The PISCIS cohort (Project for the computation of the clinical-epidemiological monitoring of HIV infection and AIDS) is an open and multicentre cohort of adult patients infected with HIV, coordinated by CEEISCAT. There are 9 participating hospitals in Catalonia and 1 in the Balearics. The cohort includes all those individuals over 16 years, with a confirmed HIV-positive serological status who visited the participating hospitals for the first time starting from 1st January 1998.

Due to the existence of diverse definitions used in the different surveillance studies, as in the prospective studies of late diagnosis [8-9] and the increasing evidence of the cost-effective

Image 4.1. Late diagnosis observed among new diagnoses of HIV infection remains high. It is necessary to continue promoting early diagnosis of HIV in general population and especially in vulnerable groups with high prevalence of HIV infection.



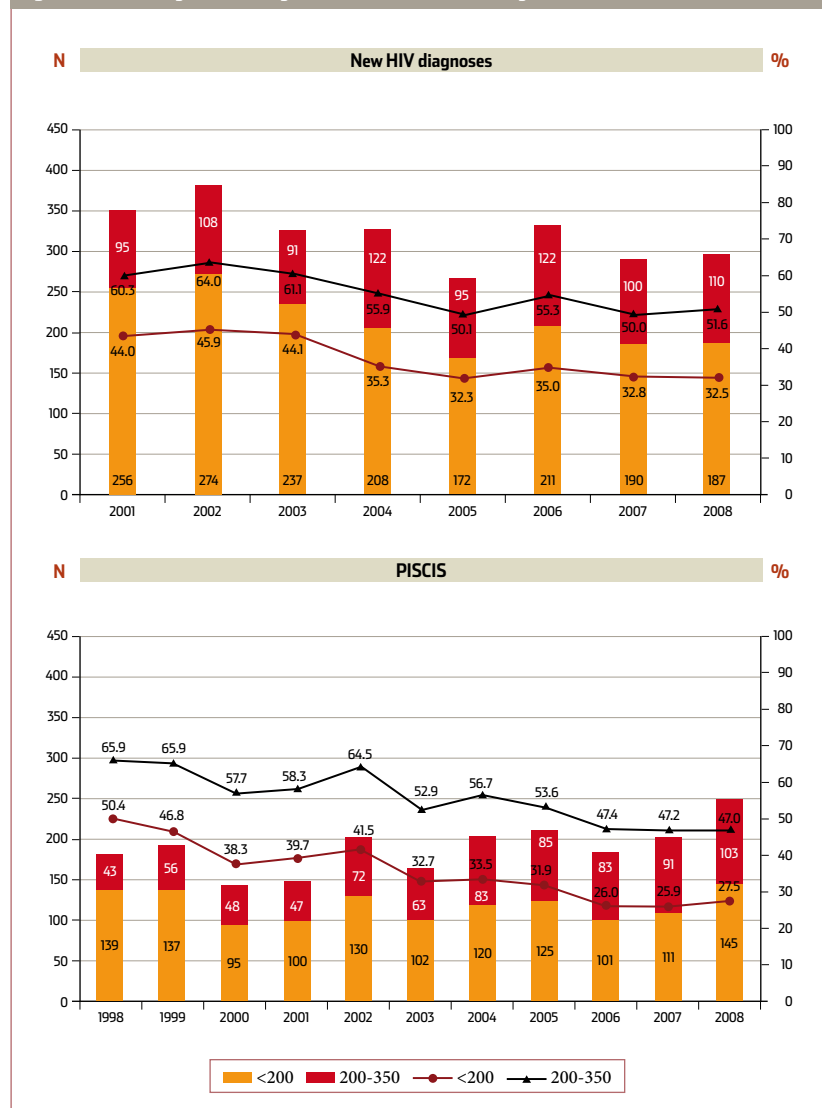
Figure 4.4.4. Characteristics of late diagnoses in new cases of HIV infection in PISCIS cohort, period 1998-2009.



benefits of starting treatment early, for this analysis two levels of CD4+ counts were considered: the patients with a basal CD4+ count <350 were considered to be late diagnosis (since it is necessary not to make the treatment difficult) and those who had a basal count of CD4+ cells <200 were considered to be very late diagnosis or of advanced HIV infection [10].

Amongst those newly diagnosed patients in PISCIS where it was possible to obtain a basal CD4+ count, 53.6% showed a CD4+ count <350 and 32.8% had a more compromised immunity on having a CD4+ count <200 cells. Figure 4.4.4 shows the profile by age, gender and routes of transmission in both groups of patients. Likewise, figure 4.4.5 shows the

Figure 4.4.5. Changes in late diagnosis in new HIV infection diagnoses. Catalonia, 2001-2008.



yearly evolution of both late diagnosis (<350 CD4+ cells) and very late diagnosis (<200 CD4+ cells)

The age group with the highest percentage of late diagnosis was the group aged over 49 years. Despite monitoring and the resultant optimum viral response to treatment and immunological recovery after six years [11], this group, due to their characteristics amongst many other reasons, could have a higher probability of complications related to morbimortality not associated with AIDS [12] and, in agreement with other studies, more difficulty to achieve immunological recovery, especially in those who begin combination ART late [13].

➤ The number of HIV diagnostic tests reported in Catalonia through the network of laboratories has been increasing, but it is still much lower than the rates of other European countries. The general population has to be made aware, so that service users themselves ask for the test, and the availability of the test in Primary Healthcare Centres must be increased.

➤ The number of HIV diagnostic tests performed in the alternative centres has greatly increased since the introduction of the rapid HIV test, although the number continues to be low with respect to the total number of tests performed in Catalonia and the percentage of positive tests has not varied significantly. There is a need to diversify

the places where the test is offered in order to reach most vulnerable groups (outreach programs).

➤ There is evidence that there are new infections amongst those who repeat the test in alternative centres. Counselling needs to be reinforced in order to modify risk behaviours.

➤ The extent of the test in IDUs and MSM continues to increase, but remains low. Both in IDUs and MSM there has been a progressive increase in the percentage of those who had taken the test on some occasion, but the promotion of the repetition of the test in those groups at higher risk must be undertaken.

➤ Delayed diagnosis observed amongst those newly diagnosed with HIV and in the PISCIS cohort study continues to be high. The promotion of the early detection of HIV in the general population and especially in vulnerable groups with a high prevalence of HIV must be continued, not just in order for them to access treatment, but also to adopt the necessary preventative measures to avoid the transmission of the virus and possible reinfections.

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