

# Prevalence of HIV Infection in Patients Seen at Specialized Diagnosis Centers in 9 Cities in Spain From 1992 to 2001

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**Objective.** To describe the prevalence of HIV infection in persons tested between 1992 and 2001.

**Design.** Descriptive, cross-sectional epidemiological study.

**Setting.** 10 ambulatory centers specialized in diagnosing HIV, located in 9 cities in Spain.

**Participants.** 53 183 persons older than 12 years, tested for the first time for HIV.

**Main measures.** Number of persons tested per year, number of persons diagnosed as seropositive for HIV according to sex, age group and category of exposure.

**Results.** The number of persons tested increased from 4401 in 1992 to 6407 in 2001. Approximately half reported heterosexual risk exposure/exposure through high-risk heterosexual behaviors, excluding prostitution. Intravenous drug users (IVDU) increased from 15.3% in 1992-1993 to 1.4% in 2000-2001, and women prostitutes/female sex workers increased from 6.7% to 25.1%. A total of 2898 persons were diagnosed as having HIV infection; 78% of them were men. The number of diagnoses decreased from a high of 1058 in 1992-1993 to 304 in 2000-2001, and this trend was seen for all categories of exposure except female prostitutes and men with heterosexual risk factors. The prevalence decreased from 14% in 1992 to 2% in 2001. There were decreases in all categories of exposure, especially during the first years of the study, with a tendency to level off. In 2001 the prevalence figures were 23.8% for IVDU, 7.9% for homosexual men and women, 0.8% for female sex workers and 1% for other heterosexual men and women.

**Conclusions.** The specialized diagnostic centers play an important role in diagnosing HIV, and this service complements primary care services. Greater efforts are needed in the prevention of HIV infection.

**Key words:** HIV. Risk behaviors. Diagnosis.

PREVALENCIA DE VIH EN PACIENTES DE CONSULTAS ESPECIALIZADAS EN EL DIAGNÓSTICO DE ESTA INFECCIÓN EN 9 CIUDADES ESPAÑOLAS, 1992-2001

**Objetivo.** Describir la prevalencia del VIH en personas que se realizaron la prueba entre 1992 y 2001.

**Diseño.** Estudio epidemiológico descriptivo transversal.

**Emplazamiento.** Diez centros ambulatorios especializados en diagnóstico del VIH en 9 ciudades españolas.

**Participantes.** Un total de 53.183 personas mayores de 12 años analizadas por primera vez para el VIH.

**Mediciones principales.** Número anual de personas analizadas, de diagnósticos de VIH y de seroprevalencia en función del sexo, la edad y las categorías de exposición.

**Resultados.** El número de personas analizadas aumentó desde 4.401 en 1992 hasta 6.407 en 2001. Aproximadamente la mitad refería exposiciones heterosexuales de riesgo, excluida la prostitución. Los usuarios de drogas por vía parenteral (UDVP) pasaron del 15,3% en 1992-1993 al 1,4% en 2000-2001, y las mujeres que ejercían la prostitución aumentaron del 6,7 al 25,1%. Se diagnosticó a 2.898 personas infectadas por el VIH, de las que el 78% era varones. El número de diagnósticos disminuyó de 1.058 en 1992-1993 a 304 en 2000-2001, tendencia observada en todas las categorías de exposición excepto en las mujeres que ejercían la prostitución y en los varones con riesgo heterosexual. La prevalencia descendió del 14% en 1992 al 2% en 2001. Se produjeron descensos en todas las categorías de exposición, más pronunciados en los primeros años y con una posterior tendencia a la estabilización, con valores que en 2001 fueron: 23,8% en UDVP, 7,9% en homosexuales, 0,8% en prostitución y 1% en otros heterosexuales.

**Conclusiones.** Estos centros realizan una importante labor de diagnóstico del VIH que complementa a la de atención primaria. Es preciso dar mayor impulso a la prevención.

**Palabras clave:** VIH. Conductas de riesgo. Diagnóstico

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## Introduction

Treatments for HIV infection have not achieved a definitive cure, and prevention therefore continues to be the main strategy in the fight against this epidemic.<sup>1</sup> The entire population is potentially susceptible to HIV infection; however, the prevalence is much higher in collectives with a higher frequency of risk exposure.<sup>1,2</sup> Because prevention is most effective when it is adapted to the characteristics of a specific population, information is needed regarding the main groups who are affected. By the end of the 1980s the prevalence of HIV infection in Spain had reached high levels: about 50% in intravenous drug users (IVDU), 25% in gay men, 9% in female sex workers, and 7% in persons with heterosexual risk behaviors.<sup>3</sup> Since then a number of preventive interventions have been initiated to change the situation,<sup>4</sup> and more recent studies have reported decreases in the rates of infection.<sup>5-7</sup>

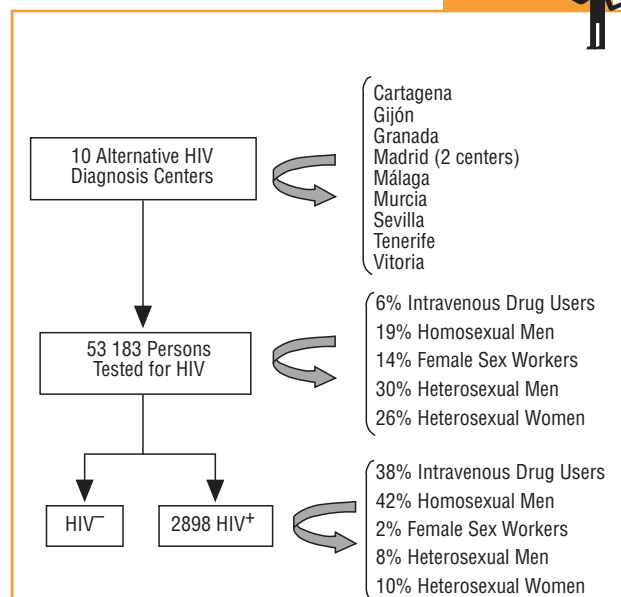
The diagnosis of HIV infection and counseling to avoid risk behaviors are aimed at a generally healthy population, and this makes the role of primary care fundamental in providing access to these measures.<sup>8,9</sup> However, the high demand for these services in some cities led to the creation of alternative centers and offices specialized in HIV counseling and diagnosis.<sup>10</sup> These centers have become reference points for particular collectives who engage in high-risk behaviors, and handle a large number of requests for HIV testing. In the present study we analyze the activity of these alternative centers in 9 cities in Spain, and describe here the prevalence of HIV infection for different types of risk exposure in the population who consulted between 1992 and 2001.

## Participants and methods

This study was carried out in a network of 10 public health centers specialized in the diagnosis of HIV infection, some of which are also specialized in other sexually transmitted diseases. These centers were located in the cities of Seville, Granada, Malaga, Gijón, Tenerife, Madrid (2 centers), Murcia, Cartagena and Vitoria. All offered free HIV testing on demand, and users were not required to show proof of identity. Patients could provide their own name, an alias or a code name to collect the results and for subsequent medical follow-up. The specially trained health care staff provided preventive counseling when the test was requested, and when the patient returned to collect the results.

In the present analysis we considered all patients older than 12 years who requested their first HIV test at any of the centers during the period from 1992 to 2001. During the interview prior to the test information was recorded on age, sex, intravenous drug use, high-risk sexual exposure involving risk of HIV transmission, and whether the patient was a sex worker. Depending on the type of risk involved, persons were classified into mutually exclusive exposure categories in decreasing order of priority as follows: IVDU, homo- or bisexual men, female sex workers, and

## Material and methods



## General Scheme of the Study

Descriptive study of persons tested for HIV infection at a network of ten alternative HIV diagnosis centers in Spain from 1992 to 2001.

heterosexual men and women with no other sources of exposure. For all patients the presence of HIV antibodies was determined in serum samples with an ELISA technique, and positive samples were verified with western blotting or immunofluorescence. The  $\chi^2$  test was used to compare proportions, and Student's *t* test was used to compare means.

## Results

### Description of Persons Who Request HIV Testing

Between 1992 and 2001 a total of 53 183 persons had their first HIV test at these centers. The number of persons tested per year increased by 46%, from 4401 in 1992 to 6407 in 2001. The percentage of women increased from 38.3% in 1992-1993 to 51.6% in 2000-2001 ( $P < .001$ ). More than half of the persons tested (54.6%) were between 20 and 29 years of age, and this proportion did not change significantly during the study period (Table 1). About half of the persons tested (excluding sex workers) were heterosexual, and this proportion showed a slight tendency to increase from 49.4% in 1992-1993 to 53.8% in 2000-2001 ( $P < .001$ ). The number of IVDU decreased

**TABLE 1** Characteristics of the participants, 1992-2001

	1992-1993	1994-1995	1996-1997	1998-1999	2000-2001
	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Sex</b>					
Men	5776 (61.7)	5955 (60.3)	5957 (57.6)	6088 (54.5)	6011 (48.4)
Women	3593 (38.3)	3926 (39.7)	4388 (42.4)	5081 (45.5)	6408 (51.6)
<b>Age groups, years</b>					
<20	487 (5.2)	605 (6.1)	594 (5.7)	643 (5.7)	654 (5.3)
20-29	5113 (54.6)	5187 (52.5)	5446 (52.6)	6147 (55.0)	6861 (55.2)
30-39	2783 (29.7)	2945 (29.8)	3054 (29.5)	3043 (27.2)	3444 (27.7)
40-49	709 (7.6)	816 (8.3)	906 (8.8)	950 (8.5)	1053 (8.5)
≥50	277 (3.0)	328 (3.3)	345 (3.3)	386 (3.5)	407 (3.3)
<b>Exposure categories</b>					
Intravenous drug users	1435 (15.3)	900 (9.1)	581 (5.6)	336 (3.0)	176 (1.4)
Homo- or bisexual men	2187 (23.3)	2196 (22.2)	1946 (18.8)	1918 (17.2)	2071 (16.7)
Female sex workers	629 (6.7)	776 (7.9)	1241 (12.0)	1746 (15.6)	3115 (25.1)
Heterosexual men	2337 (24.9)	2823 (28.6)	3322 (32.1)	3714 (33.3)	3639 (29.3)
Heterosexual women	2300 (24.5)	2592 (26.2)	2774 (26.8)	3001 (26.9)	3042 (24.5)
Total	9369 (100.0)	9881 (100.0)	10 345 (100.0)	11 169 (100.0)	12419 (100.0)

by 88%, from 15.3% in 1992-1993 to 1.4% in 2000-2001 ( $P<.001$ ). In contrast, the proportion of female sex workers showed the greatest increase, from 6.7% to 25.1% ( $P<.001$ ). The number of homosexual or bisexual men tested remained relatively constant throughout the study period, although the proportion of patients belonging to this group decreased from 23.3% to 16.7% ( $P<.001$ ) (Table 1).

*Description of Persons Diagnosed as Having HIV Infection*

During the 10-year study period a total of 2898 HIV in-

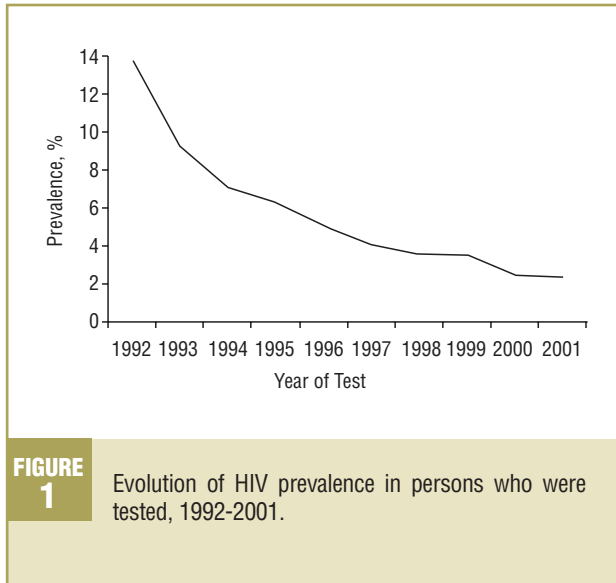
fections were diagnosed in patients who came to the centers for the first time. The number of diagnoses decreased by 71%, from 1058 in 1992-1993 to 304 in 2000-2001.

More than three fourths (78%) of the persons diagnosed has having HIV infection were men, and no clear tendency was noted in this percentage. Mean age remained unchanged at about 29 years, and increased only among IV-DU, from 27 to 32 years ( $P<.001$ ).

The number of patients diagnosed as having HIV infection decreased in all exposure categories with the only exception of female sex workers. The greatest decrease was

**TABLE 2** Characteristics of persons diagnosed with HIV infection, 1992-2001

	1992-1993		1994-1995		1996-1997		1998-1999		2000-2001	
	N (%)	Mean Age	N (%)	Mean Age	N (%)	Mean Age	N (%)	Mean Age	N (%)	Mean Age
<b>Sex</b>										
Men	813 (76.8)	30.2	513 (77.5)	30.3	365 (77.5)	30.5	317 (79.8)	30.5	237 (78.0)	30.7
Women	245 (23.2)	28.3	149 (22.5)	28.5	106 (22.5)	28.3	80 (20.2)	28.2	67 (22.0)	28.1
<b>Exposure categories</b>										
Intravenous drug users	518 (49.0)	27.0	258 (39.0)	28.0	153 (32.5)	29.9	93 (23.4)	30.9	41 (13.5)	32.0
Homo- or bisexual men	383 (36.2)	29.0	265 (40.0)	29.4	196 (41.6)	29.9	185 (46.6)	29.7	166 (54.6)	29.9
Female sex workers	12 (1.1)	29.9	9 (1.4)	29.9	10 (2.1)	28.8	18 (4.5)	28.4	23 (7.6)	27.9
Heterosexual men	46 (4.3)	31.4	42 (6.3)	31.4	48 (10.2)	30.9	55 (13.9)	30.8	38 (12.5)	31.2
Heterosexual women	81 (7.7)	28.0	65 (9.8)	28.2	57 (12.1)	28.0	38 (9.6)	28.0	32 (10.5)	28.3
Total	1058 (100.0)	29.5	662 (100.0)	29.6	471 (100.0)	29.6	397 (100.0)	29.4	304 (100.0)	29.4



**FIGURE 1** Evolution of HIV prevalence in persons who were tested, 1992-2001.

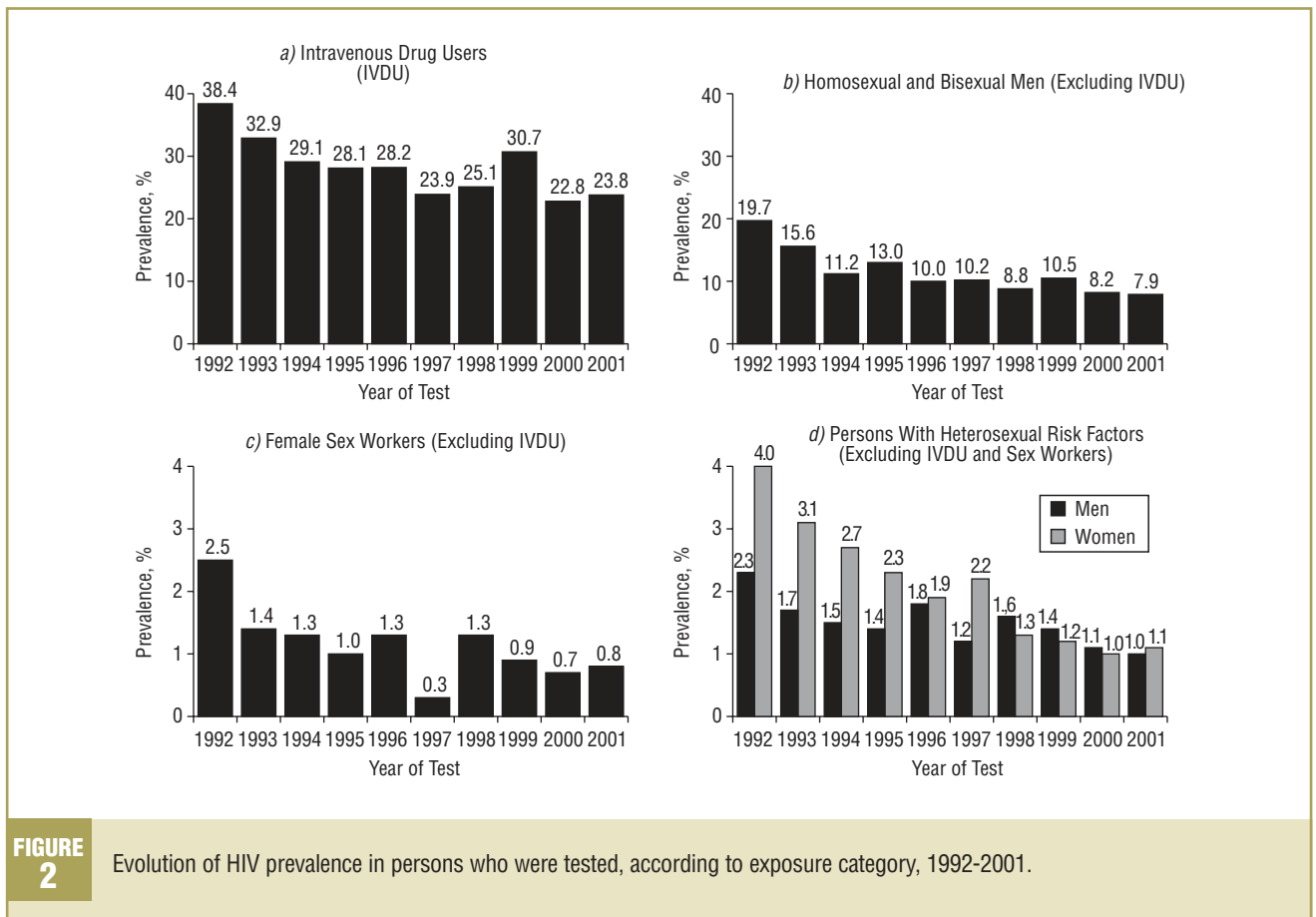
seen in IVDU, from 49.0% of all persons diagnosed in 1992-1993 to 13.5% in 2000-2001 ( $P < .001$ ). This marked decrease in IVDU was reflected as a corresponding increase in the percentages of patients in all other transmission categories (Table 2).

*Evolution of seroprevalence of HIV*

Seroprevalence of HIV in persons who requested the test showed a steady decrease from 14% in 1992 to 2% in 2001 ( $P < .001$ ), although the decline has slowed in recent years (Figure 1).

Among IVDU, seroprevalence of HIV decreased from 38.4% in 1992 to 23.8% in 2001 ( $P = .008$ ) (Figure 2a), but remained much higher than in the rest of the exposure categories. In homosexual and bisexual men, this figure declined during the same period from 19.7% to 7.9% ( $P < .001$ ). This decrease was more pronounced during the initial years of the study period, but little further decrease was seen during the final years of the study (Figure 2b). In female sex workers the prevalence of HIV infection decreased from 2.5% in 1992 to 0.8% in 2001 ( $P = .007$ ), although no particular trend was evident during the final years of the study (Figure 2c).

Among persons exposed via heterosexual risk behaviors the prevalence of HIV infection also decreased in both men and women. In men the prevalence declined from 2.3% in 1992 to 1.0% in 2001 ( $P = .005$ ). In women the initial prevalence was nearly double that in men at the start of the study (4.0% vs 2.3%;  $P = .028$ ), so the decrease was more pronounced, such that by the end of the study period



**FIGURE 2** Evolution of HIV prevalence in persons who were tested, according to exposure category, 1992-2001.

the difference between sexes has disappeared (1.0% in men vs 1.1% in women;  $P=.918$ ) (Figure 2d).

## Discussion

This study found a decrease in the prevalence of HIV infection in persons who came for testing between 1992 and 2001 because of possible risk exposure. The prevalence decreased in all exposure categories, and the decreases were more pronounced during the early years of the study, with a trend toward stabilization during the final years. Moreover, we found a clear decrease in the number of IVDU who came to the centers to request their first HIV test. The steady decrease in this exposure category, initially associated with a high prevalence of infection, was a major contributing factor to the decrease in overall prevalence. This study comprised a large number of participants in widely distant geographical areas within Spain. However, the profile of risk categories for users who came to these centers was different from the overall profile for the HIV epidemic in Spain: in our study homosexual men and female sex workers were over-represented. Moreover, the results should be interpreted in the light of the fact that persons who requested the test voluntarily probably perceived themselves to be at risk.

The yearly increase in the number of persons who came to these centers for the first time to request HIV testing seems to indicate a growing awareness by some collectives of the advantages of knowing ones HIV status.

Among those who requested HIV testing, the decline in the number of IVDU was noteworthy. This is consistent with the decrease in the number of new IVDU observed in Spain, as a result of shifts toward other routes of administration of controlled substances<sup>11</sup> and the decline in the number of young IVDU.<sup>12,13</sup> In addition, among IVDU we detected a moderate decrease in the prevalence of HIV infection, which reflects a lower risk among injection drug users possibly because of the effect of needle exchange programs.<sup>11</sup> These changes have all contributed to the considerable decrease in the number of new infections among IVDU.

The number of female sex workers who request the test has increased considerably in recent years. Information available to date is insufficient to determine whether this is due to an actual increase in the size of this group, or to an increase in the proportion of members who request HIV testing. However, both factors are likely to be involved. Other studies have reported an increase in the presence of immigrant women who work as sex workers in Spain.<sup>14</sup> Of the collectives we studied, this group showed the lowest prevalence of HIV infection, with a rate similar to that in the general population of young adults.<sup>15</sup> Homosexual men make up a large group of continuous users of these centers. In contrast to IVDU, the number of

Discussion  
Key points



### What Is Known About the Subject

- Despite advances in the treatment of HIV infection, a definitive cure remains unavailable.
- In principle, the entire population is susceptible to HIV infection. However, prevalence is much higher in collectives with the highest frequencies of risk exposure.
- Prevention remains the main strategy in the fight against HIV infection, and preventive measures are more effective when they are adapted to a specific collective's circumstances and characteristics.

### What This Study Contributes

- The prevalence of HIV infection during the period from 1992 to 2001 has decreased in all transmission categories, although the rate of decrease has shown a tendency to level off in recent years.
- The possibility of heterosexual exposure was the most frequent motive for requesting HIV testing, whereas requests by intravenous drug users have decreased markedly.
- The number of diagnoses of HIV infection had decreased by 2001 to one third the number recorded in 1992, and sexually transmitted infections clearly outnumbered infections related with intravenous drug use.

homosexual men seems to be more stable owing to the steady influx of young men into this group.<sup>6</sup> The prevalence of HIV infection in this collective decreased during the initial years of the study, but by the end of the study period the decline had leveled off at rates that can still be considered high. This pattern indicates the persistence of risk behaviors during sexual relations in these men.<sup>16</sup> Throughout the study period, the possibility of heterosexual exposure remained the most frequent reason for requesting an HIV test, and this category was equally frequent in men and women after sex workers were excluded. The prevalence of HIV infection in this group has remained higher than in female sex workers. During the early years of the study the prevalence was higher in women than in heterosexual men, possibly because women were more likely to have a sexual partner who was HIV infected.<sup>13,17</sup> This prevalence subsequently decreased, and eventually the difference between sexes disappeared.

Once notification systems for HIV infection<sup>1,18,19</sup> were established and sentinel physicians were incorporated into primary care,<sup>8</sup> we detected a change in the epidemic in Spain. The decrease in the influence of IVDU on the statistics meant that most of the HIV infections diagnosed more recently have been ascribed to sexual transmission.<sup>19</sup> However, this effect does not necessarily mean that infections via this route of transmission have increased.

Alternative centers for the diagnosis of HIV infection play an important role in lightening the burden on primary care centers within the health care network, and in facilitating access by some types of patient to preventive counseling and testing. However, these centers are only available in certain cities, and their influence is limited to those persons who seek help voluntarily. Therefore these centers cannot take the place of primary care in making diagnostic tests for HIV available to all citizens. Moreover, primary care services are also able to reach persons who, although not considered at risk, may have been exposed to HIV.<sup>20</sup> To ensure the availability of adequate care to all persons, these services should incorporate the detection of risk behaviors and preventive counseling for patients who are perceived to be at potential risk of exposure.

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## COMMENTARY

# HIV Infection: Are We Doing Our Homework?

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In Spain and throughout the world, the human immunodeficiency virus (HIV) and AIDS epidemic constitute a serious public health problem. The epidemic, now in its third decade, can be divided into three different stages. During the 1980s HIV spread rapidly. In Spain the main route of transmission was through intravenous drug use. Heterosexual mother-to-child transmission also occurred, whereas homosexual transmission between gay men was less notable. During this period mortality from AIDS became the leading cause of potential years of life lost. In the early 1990s prevention programs became more active, especially those aimed at the groups most vulnerable to HIV infection. Seroprevalence began to decline among intravenous drug users (IVDU), homosexual persons and female sex workers. Mid-way through the 1990s, with nearly 7000 cases of AIDS diagnosed and more than 5000 deaths annually, highly active antiretroviral treatment with protease inhibitors was introduced, and the incidence of AIDS and its mortality both decreased markedly.

Current estimates place the number of persons with HIV infection between 110 000 and 150 000, nearly one fourth of whom are unaware that they are infected. We can surmise that between 50% and 60% have contracted the disease through injection drug use, and 20% to 30% through risk behaviors for heterosexual transmission. Risk behaviors for homosexual transmission account for 15% to 25% of all current infections.

Current epidemiological data for HIV infection and AIDS<sup>1</sup> indicate that the epidemic is waning, the number of new cases of HIV infection having decreased by almost 60% since the start of the 1990s. However, the rate of decrease in the incidence of new cases of AIDS diagnosed in Spain has leveled off.

Among IVDU, seroprevalence and the number of new HIV infections have decreased. In contrast, sexual transmission has become more frequent, especially among heterosexual persons and in women. (Seroprevalence among homosexual persons has decreased.) Sex partners of persons with HIV infection, especially partners of IVDU, have shown the most worrying trends. Among female sex workers seroprevalence remains below 2%.

Progression from HIV infection to AIDS is declining, but the interval between infection and diagnosis of HIV infection, when the virus can be transmitted to other persons

## Key Points

- Although the epidemic is remitting, HIV infection and AIDS still constitute a serious public health problem.
- A substantial number of persons who develop AIDS are unaware that they are HIV infected.
- Alternative centers fulfill the needs of specific groups within the general population.
- Primary care has a fundamental role to play in the early diagnosis of HIV infection.

and the carrier cannot benefit from antiretroviral treatment, needs to be drastically shortened. This would affect the incidence of AIDS and mortality from the epidemic. Efforts are also needed to improve the course of the epidemic in homosexual persons and partners of persons with HIV infection.

Further important challenges are to foment adherence to treatment, and to avoid the appearance of resistance to antiretroviral drugs and adverse events that make withdrawal of treatment necessary.

The 2001-2005 Multisectorial Plan for HIV infection and AIDS in Spain<sup>2</sup> has set clear goals and defined specific indicators for prevention, which is envisioned as part of the wider system of health care in order to enhance coordination between prevention and care. The general population includes persons who are at low risk for HIV infection and who seek care frequently for other reasons unrelated with HIV, e.g., for primary care or gynecological consultations. Opportunities for new infections arise among persons in frequent or close contact with those who are HIV infected, persons who engage in risk behaviors, persons who are in habitual or occasional contact with centers that provide care for drug addicts, persons with sexually transmitted diseases, persons with sporadic sexual contacts, and female sex workers. The multisectorial plan therefore also foresees the use of preventive measures in centers for sexually

transmitted diseases, and recommends sentinel surveillance for HIV infection to monitor the disease in selected populations that are targets for preventive interventions (IVDU, female sex workers, etc).

It is within this context that we should consider the study by the EPI-VIH Group, a research group with solid experience in HIV epidemiology.<sup>3</sup> We should perhaps note that persons who use alternative centers that provide anonymous, voluntary HIV testing form a group whose risk profile differs from that of users of other types of health care center.

The number of diagnoses of HIV infection decreased from 1058 in 1992-1993 to 304 in 2000-2001, and this trend was seen for all exposure categories except female sex workers. The decrease was greatest among IVDU. Similarly, the prevalence of HIV infection decreased from 14% to 2%, a trend seen for all types of transmission.

The decrease in IVDU may reflect a shift to other routes of administration and the results of risk-reduction programs offering needle exchange and methadone maintenance. These factors also contribute to the decrease in the number of new diagnoses of HIV infection.

Men who engage in homosexual or bisexual relations represent a much larger group of users at alternative centers than at other centers. The number of these users has remained more or less unchanged, and the prevalence of HIV infection in this group has decreased, particularly during the early years of the epidemic. The slowed rate of decrease in recent years, however, seems to indicate that some risk behaviors remain common in this group.

Among female sex workers the demand for counseling and HIV testing has increased, along with the prevalence of HIV infection.

Although high-risk sexual practices are the most frequent reason for requesting HIV testing, the prevalence of HIV infection in this group of users has decreased, while the sex ratio in these users has approached one.

What measures should be considered for the future? For the present it appears that we are not diagnosing HIV infection in a timely manner: one third of the persons who develop AIDS did not know they were HIV infected.<sup>4</sup> These are important deficiencies in the early diagnosis of HIV infection, and are particularly worrisome for individuals who do not clearly consider themselves as persons who engage in risk behaviors. Improvements in prevention and the effectiveness of antiretroviral treatment will depend on whether such deficiencies are corrected.

Sources of information also await consolidation and improvement. For example, greater coordination should be sought with epidemiological surveillance services that record new HIV infections (as in the regions of Asturias, Navarra, La Rioja and the Balearic Islands)<sup>5</sup>. These services make it possible to obtain information on the characteristics of persons with HIV infection in a timely

manner. Such information is fundamental for planning preventive interventions and controlling HIV, and in responding to the health and social needs of persons who are currently infected. Progress is also needed in monitoring HIV infection in specific populations for which preventive activities are targeted (e.g., IVDU, homosexual persons, male and female sex workers).

Primary care services should play a larger role and be more closely involved in health promotion, especially in efforts aimed at patients who are not infected and have no known risk factors. A greater role for primary care in prevention is also desirable because the continuity and frequency of clinical contacts with large numbers of persons in the community offer a superb opportunity to disseminate information about prevention and to reinforce health-promoting behaviors.

Prevention is not an easy task, as there is no explicit demand for preventive interventions. For IVDU, such measures comprise strategies to reduce risk. To prevent mother-to-child-transmission, HIV testing for sexually active women is advisable. Occupational prevention requires efforts to reduce needlestick injuries. Once the general population becomes more knowledgeable about HIV infection, these practices will become long-term health-promoting habits.

To make further progress in our knowledge about and control of the HIV epidemic, we must make prevention our main goal, place prevention within the sphere of health care, and integrate preventive and health care measures more fully. Primary care should play a more active role in these efforts<sup>6</sup>.

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