

# ***WORKING PAPER***

## **AIDS AND HIV SURVEILLANCE IN EUROPE**

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## ABSTRACT

As of June 30, 1988, 14,299 European cases of acquired immunodeficiency syndrome (AIDS) had been reported to the World Health Organization; 81 percent of these cases were diagnosed in France, the Federal Republic of Germany, Italy, the United Kingdom and Spain. There were 7,689 homosexual or bisexual cases (54 percent); 3,218 (23 percent) were intravenous (IV) drug abusers; and 1,043 (7 percent) were heterosexuals who had had sexual intercourse with an infected individual. The epidemic started in the early 1980s among homosexuals and resident of African countries who came to Europe for treatment. AIDS started spreading later, in 1983 and 1984, to the IV drug abusing community in which the epidemic is now spreading faster than in any other group. Short term predictions show that by 1989 there may be 56,400 AIDS cases in the European Community alone. The World Health Organization estimates that there are approximately 480,000 persons in Europe infected with the human immunodeficiency virus (HIV), the causative agent of AIDS. The crucial factor concerning the future of the HIV epidemic remains the extent to which the virus will spread beyond the high-risk groups and into the population at large. It is certain however that given the long incubation period of AIDS and the large number of people who are known to be infected, Europe will live through a protracted epidemic that will last at least another decade or two.

## FOREWORD

IIASA's Population Program recently started a research activity on the demographic and social consequences of the AIDS epidemic. This will encompass the development of an AIDS Information and Documentation System (AI&DS), mathematical modelling including the estimation of potential years of life lost through AIDS and the study of behavioral and economic consequences. Despite the large international efforts in (mostly medical) AIDS research, these questions seem to be a niche that merit further exploration.

This first Working Paper which was produced in collaboration with Marc Artzrouni, Professor at Loyola University in New Orleans, gives a brief description of the current knowledge on the spread of the infection in Europe.

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# AIDS AND HIV SURVEILLANCE IN EUROPE

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## I: BACKGROUND

The acquired immunodeficiency syndrome (AIDS) is caused by a virus which has become known as the human immunodeficiency virus (HIV). An individual can become infected with HIV only through transfers of body fluids during sexual intercourse, through blood transfusions, by sharing hypodermic needles with already infected individuals, and perinatally, i.e., from an infected mother to her newborn child. The virus can remain dormant for several years, with the infected person showing few or no symptoms of infection. The percentage of infected people who will develop AIDS is still unknown. It was first believed that perhaps 10 or 20 percent of infected persons would succumb, but several ongoing studies suggest that this number may in fact be as high as 100 percent. (Anderson and May, 1988).

There is considerable uncertainty concerning the incubation period of AIDS, i.e., the time between exposure to HIV and the development of full-blown AIDS. The most recent studies suggest that the mean incubation period may be about eight years, although it is believed to be shorter for children and elderly people (Medley *et al*, 1987). Because of the long incubation period of AIDS, there are currently many more infected individuals than there are AIDS cases. It is therefore important to be able to assess the prevalence of HIV infection, since the pool of infected individuals will gradually move on to develop AIDS. However, surveillance of HIV infection is difficult because most infected people are asymptomatic before they develop AIDS.

It was long believed that HIV had originated in Africa and then carried to Europe and the United States by immigrants or returning vacationers (Ancelle and Couland, 1985). However, a growing body of evidence suggests that HIV may have existed since the beginning of this century in Africa, Europe, and the United States. Because the transmission rates remained below the threshold level at which the epidemic could spread widely, the number of individuals with AIDS-like clinical manifestations remained small until the 1960s and 1970s, at which time socio-political changes in Africa and changes in life style in the United States and Europe provided fertile grounds for a rapid spread of the virus in all regions simultaneously (Wendler, 1986; Katner and Pankey, 1987; Chuffart, 1988).

The World Health Organization (WHO) estimates that between 5 and 10 million people worldwide are currently infected with HIV (WHO, 1988a). The first cases of AIDS were diagnosed in 1981 among homosexual men in the United States and Europe, as well as among residents of Africa and the Caribbeans who came to Europe for treatment (Biggar, 1987). As of September 1988 WHO had received 112,000 reports of AIDS cases from 176 countries in five continents. The Americans reported the largest number with a total of 81,000, of which 71,000 were in the United States. Africa and Europe reported about 15,000 cases each, and Asia and Oceania together had less than 1,300 cases (WHO, 1988d).

## II: AIDS IN EUROPE

The surveillance of AIDS in Europe is coordinated by the WHO Collaborating Centre on AIDS, created in 1984 in Paris at Claude Bernard Hospital. The Centre compiles standardized surveillance data provided by one nationally recognized source in each of the 30 participating countries (Ancelle and Brunet, 1987; Ancelle *et al*, 1987). AIDS cases reported to the Centre meet the surveillance definitions of the Centers for Disease Control (CDC) which were established in 1982, and revised in 1985 and 1987 (CDC, 1987a).

### 1. Aggregate surveillance data

As of June 30, 1988, a cumulative total of 14,299 cases had been reported from 30 European countries (Table 1)(WHO, 1988c). The five largest European countries (France, the Federal Republic of Germany, Italy, the United Kingdom and Spain,) each reported more than 1,400 cases, with the largest number in France (4,211 cases). The Netherlands (539 cases) and Switzerland (502 cases) have the next largest numbers of cases. Only some 80 cases were reported from Eastern Europe, with the largest number in Yugoslavia (40 cases).

A more accurate picture of the spread of AIDS in Europe can be drawn by calculating incidence rates per million population (Table 1). Figure 1 depicts incidence rates per million population up to May 1987 and May 1988. (The United States and Canada are included as a measure of comparison.) Switzerland (76.1 cases/million), France (75.7), and Denmark (57.3) have the highest rates. The rates for the Federal Republic of Germany, Italy, Spain, and the United Kingdom are clustered at lower levels, namely in the interval 28 to 38 cases per million inhabitants.

Within countries there are considerable regional variations in incidence rates of AIDS, with much higher rates in more urbanized areas and large cities. The incidence of AIDS in the NW Thames Region was more than 15 times that of the Regions of England outside the Thames Region (PHLS, 1988). In 1985 the incidence rate of AIDS in the Paris region was 84 per million while it was 30 per million for the country as a whole (Ancelle-Park *et al.*, 1987). In 1985 Geneva and Zürich had incidence rates of 62 and 46 per million, respectively, while the rate for Switzerland as a whole was 6 per million. Similar concentrations of AIDS cases are found in the Federal Republic of Germany and in Italy (Brunet and Ancelle, 1985)\*.

Trends in incidence rates per million population by half-year of diagnosis provide useful information on the temporal dimension of the spread of AIDS. These trends are depicted in Figure 2 for the 15 countries with 50 cases or more. The apparent decrease in

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\* In October 1988 the incidence of AIDS in Berlin (West) was 264 and in Frankfurt 191 per million while it was 41 per million for the Federal Republic of Germany.

the incidence rate for the beginning of 1988 is due to the fact that data is available only for the first quarter. Also, the incidence rate for recent years (1986 and 1987) is underestimated because of reporting delays. Despite these biases, the picture conveyed by Figure 2 clearly shows that the number of new AIDS cases is increasing in most countries.

A more accurate picture of the temporal evolution of AIDS in Europe can be obtained after correcting the data for reporting delays. These delays vary between country, but overall about 10 percent of AIDS cases are reported more than one year after being diagnosed (Downs *et al.*, 1988). After correcting for reporting delays Downs *et al.* have estimated the doubling time of the cumulative number of AIDS cases for the European Community, Sweden and Switzerland, which have reported the vast majority of AIDS cases in Europe. According to these estimates the doubling time has been lengthening since the beginning of the epidemic from a low of about seven months in 1982 to about 11 months in 1986. There are however considerable differences between countries, with more pronounced decreases of the doubling time in some countries (e.g., Denmark, the Federal Republic of Germany, and Switzerland) than in others (e.g., Spain, Austria, and France).

At the beginning of the epidemic substantial numbers of AIDS patients were non-European residents of Africa and the Caribbeans. By March 1985, 156 (17 percent) of the 940 reported cases were known to be residents from these two regions (Ancelle and Couland, 1985). By December 1987, when the total number of cases had increased tenfold to 9,930, the number of cases from Africa and the Caribbeans had been multiplied by only 3, and the totaled 491 cases (5 percent)(Brunet *et al.*, 1988).

The proportion of non-Europeans varies considerably between transmission groups as well as through time. By March 1985 there were 126 (70 percent) heterosexual contact cases from Africa and the Caribbeans out of a total 179 such cases. By December 1987 this percentage had decreased to 40 percent, with 241 heterosexual contact cases from these regions out of a total of 609. In 1985, there were 13 (2 percent) homosexual/bisexual cases from these regions out of a total of 661 such cases and there were no IV drug abusers. By December 1987 there were 40 (0.7 percent) homosexual/bisexual from these regions out of 5,865 such cases and 21 (1 percent) IV drug abusers out of 1,944 total IV drug abusers. In summary, the proportion of non-European AIDS cases has decreased over the years, to levels that are negligible among IV drug abusers and homosexual/bisexual men, but remain substantial among heterosexual contact cases.

## 2. Surveillance data by sex and age group

Of the 13,943 adult cases, 12,415 (89 percent) are male. This high proportion of males reflects the large number of homosexual/bisexual men with AIDS. There are 356 paediatric cases (i.e., children under 13 years of age); 215 (60 percent) of those were male.

Overall, 86 percent of males cases and 80 percent of female cases were in the 20 to 49 years age groups. The female cases were highly concentrated in the 20 to 29 years age group (51 percent), whereas the maximum concentration of male cases was in the 30 to 39 years age group (38 percent).

## 3. Surveillance data by transmission category

Of the 14,299 cases of AIDS, 7,689 (54 percent) are male homosexuals or bisexuals, 3,218 (23 percent) are IV drug users, 1,109 (8 percent) cases are haemophiliacs or transfusion recipients, 1,043 (7 percent) are heterosexual contact cases, and 264 (2 percent) are perinatal cases. There are 337 cases (2 percent) that are both homosexual/bisexual and IV drug users, and there are 639 cases (4 percent) with unknown transmission category.

Although the overall proportion of male cases is about 90 percent, this value is much lower in certain risk groups. By June 1988 the percentages of males among IV drug abusers, heterosexual contact cases, and transfusion recipients were respectively 74, 64,

and 59 percent (WHO, 1988c).

The percentages in each transmission category are broken down by country in Figure 3. (As a measure of comparison Canada and the United States were added to the 15 European countries with the highest incidence of AIDS). The figure shows that there are considerable differences between countries in the make-up of the epidemic. As in the United States and Canada, in countries north of France and Switzerland (except Belgium) more than 60 percent of cases are homosexual/bisexual. This transmission group represents less than 60 percent in France, Belgium, and southern Europe. The percentage of homosexual/bisexual males varies from a high of 83 percent in the Netherlands to a low of 19 percent in Italy. In all southern countries this smaller percentage of homosexual/bisexual males corresponds to a larger group of IV drug abusers. The percentage of IV drug abusers is as low as 6 and 2 percent in the Netherlands and the United Kingdom, respectively, and as high as 63 percent and 58 percent in Italy and Spain.

There are variations between countries in the percent of heterosexual contact cases. Of the 15 countries with the highest caseloads, only three report more than 10 percent of cases as heterosexual: Portugal and Greece both have 18 percent, and Belgium is an outlier with 53 percent. This high percentage is due to the fact that 59 percent of cases diagnosed in Belgium were among expatriates and foreigners who had lived in the country less than 5 years and had gone to Belgium for treatment following their exposure to AIDS through heterosexual contact in Africa (IHE, 1988).

An examination of temporal trends in the breakdown of AIDS cases by transmission group sheds light on the dynamics of the epidemic. The first cases were reported in the early 1980s in homosexual/bisexual men and in heterosexuals; most patients in this latter group were diagnosed in Belgium and in France and had contracted the disease through heterosexual contact in African and Caribbean countries where AIDS was developing outside the main risk groups. In Belgium, for example, the percentage of cases among non-residents was 97 percent in 1983, but fell rapidly thereafter. (Brunet *et al.*, 1988; Ancelle and Couland, 1985; Downs *et al.*, 1987).

The outbreak in the early 1980s of a homosexual epidemic in France, the Federal Republic of Germany, and the United Kingdom, and the concurrent outbreak of a heterosexual epidemic in France and Belgium were followed in the mid-1980s by the emergence of an AIDS epidemic of IV drug abusers. This later epidemic affected Italy and Spain first, then the Federal Republic of Germany, France, and to a lesser extent Switzerland.

The shifts in the epidemiologic make-up of AIDS in Europe can be measured by noting that in 1983, 164 cases (61 percent) were diagnosed in homosexual/bisexual men, and 57 cases (21 percent) were diagnosed in heterosexuals. That same year there were only 4 cases (1 percent) among IV drug abusers. In 1987, however, the proportion of AIDS cases among homosexual/bisexual men and among heterosexuals had dropped respectively by 10 and 15 percent to 51 and 6 percent of cases diagnosed during that year (Figure 4). The 25 percent of cases lost in these two groups were found among IV drug abusers, whose share had risen from 1 to 26 percent. These statistics confirm that the epidemic among IV drug abusers is more recent than in homosexual/bisexual men and that its growth has also been more rapid than in the other groups.

The relatively rapid increase in the number of IV drug abusers with AIDS has caused the mean age of AIDS patients to decline and the proportion of women patients to increase: the proportion of AIDS patients under 30 has increased from 20 to 34 percent and the sex ratio has dropped from 11.7 men for each woman to 7.6 (Brunet *et al.*, 1988; WHO, 1988c). These shifts can be explained by the fact that IV drug abusers tend to be young, and that their growing number mitigates the weight of the all-male group of homosexual/bisexual men.

### III: HIV IN EUROPE

As indicated earlier there is no accurate and complete data on the total number of people infected with HIV because most infected individuals remain asymptomatic until they develop AIDS. However, WHO has compiled rough estimates of the prevalence of HIV infection in Europe on the basis of information provided by individual countries (Table 2). The table first gives the numbers of known seropositive individuals, i.e., the number of individuals who have tested positive for the HIV antibody. (These data are based on laboratory reports or tests performed on donated blood). These estimates represent minimum levels of HIV prevalence, since it is known that there are many more infected individuals who have not yet been tested.

The table also presents maximum, minimum, and best estimates of HIV prevalence in each European country. The best estimates for the total number of infected individuals in Europe is in the 470,000 to 480,000 range. This number can be compared to the official estimate of 1 to 1.5 million infected individuals in the United States (CDC, 1987b). It should be emphasized that in both cases these are merely orders of magnitude that are subject to revision as additional data become available.

The presence of HIV in the body is determined indirectly by testing blood for the presence of serum antibodies against the virus. Seropositivity tests are now routinely used to test for HIV infection in selected groups (blood donors, IV drug abusers, persons attending sexually transmitted disease clinics, prostitutes, etc.) In one large scale study drawing data from 11 European countries, 10,301 individuals were tested during the years 1981-1984 (Ebbesen *et al.*, 1986). The following groups were represented in the study: healthy male homosexuals, patients with AIDS, IV drug abusers, hemophiliacs, and non-risk group members.

The data showed an increase in seropositivity in high-risk groups that paralleled the growth in the number of AIDS cases. For example the percent infected with HIV among Italian male homosexuals rose from 1 percent in 1981 to 19 percent in 1984. Among Swiss IV drug abusers the percent rose from 0 percent to 46 percent.

Several countries have conducted seroprevalence studies among specific groups. Because of differences in the study designs results cannot easily be compared, even within a given risk group and for the same country. However, the results provide orders of magnitude and are useful in comparing the prevalence of HIV in different risk groups. The results of a number of studies are presented in Table 3 and Figure 5. For the 20 studies conducted with IV drug abusers the percent infected varied from 0 percent (in Bern, 1979-1981) to 71 percent among Italian prostitutes in 1984. The median was 35.5 percent. Six studies among homosexuals produced percentages between 10 and 31 percent. Among blood donors the percentage was 0.2 percent in one German study and less than 0.1 percent in large scale screenings in France, Spain, and the United Kingdom.

The overall picture is that of an infection that has already spread significantly in the homosexual and IV drug abusing communities. The much lower incidence rates found among blood donors reflect the fact that HIV is spreading more slowly in the population at large.

### IV: SHORT-TERM PREDICTIONS

The WHO Collaborating Centre on AIDS does short-term predictions of AIDS in Europe based on an exponential model that assumes a constant growth rate over a period of two years (i.e., a doubling time that remains constant) (Downs *et al.*, 1987; Downs *et al.*, 1988). In view of the declining trend in the doubling time, such predictions are believed to provide upper bounds to the number of AIDS cases over the next two years. The results of WHO's predictions for 12 countries plus the European Community as a

whole are presented in Table 4. The baseline period is December 31, 1987, and the number of predicted AIDS cases in 1988 and 1989 is given for each country and the European Community.

France is expected to have the largest number of cases with 21,101 AIDS cases by the end of 1989. Four countries are predicted to have a cumulative total between 6,000 and 12,000 cases (Italy, the Federal Republic of Germany, Spain, and the United Kingdom). Austria, Belgium, Denmark, Greece, the Netherlands, Norway and Switzerland are expected to have less than 1,700 cases. The predicted total for the European Community is 56,400.

## V: DISCUSSION

With a total of 14,299 AIDS cases to date, Europe is confronted with a serious epidemic that has made significant inroads in the high-risk groups of homosexual/bisexual men and IV drug abusers.

Although the basic modes of transmission of HIV are the same for all countries, there are considerable differences between countries in the make-up of the epidemic. In northern Europe the majority of cases are found in homosexual men, whereas in southern Europe the epidemic has affected primarily IV drug abusers. In Belgium, the same virus was introduced by heterosexual patients who had contracted the disease in Africa. These variations reflect differences in life styles, in degrees of acceptance of these life styles, and also in the timing and the history of the epidemic. For example, in one country HIV may have taken hold first among IV drug abusers, then penetrated the homosexual community through a "bridge" of homosexual IV drug abusers. In another country the virus may have penetrated the homosexual community first, and only later affected IV drug abusers. To date, the virus has not spread much beyond these high-risk groups (and their sexual partners) because transmission of the virus is truly efficient only through the sharing of needles and through sexual intercourse, particularly between homosexual men.

The future course of the HIV epidemic depends crucially on the extent to which HIV will spread in the heterosexual population. This spread will depend on whether the heterosexual cases will remain primary infections contracted directly from individuals in high-risk groups, in which case the heterosexual epidemic will run its course once HIV has saturated these high-risk groups. There is some evidence to suggest that this may be occurring. Rates of new infections among homosexuals are stabilizing and the numbers of new AIDS cases may soon be leveling off in some countries (e.g., the United Kingdom (PHLS, 1988); Brunet *et al.*, 1988).

If on the contrary the epidemic sustains itself among non-drug abusing heterosexuals, with even a slow, drawn-out increase as suggested by Anderson and May (1988), then Europe (as well as the United States) is faced with the prospect of a major epidemic that would have profound social, economic, political, and ethical implications.

Europe is now at a critical point in its fight against the spread of HIV. Indeed, it is too soon to predict which scenario will play itself out, but the answer could come in two or three years. Although few things are known with certainty concerning the future course of AIDS in Europe, we do know that there is a large pool of infected individuals who will come down with AIDS for at least another decade or two. We will therefore witness a protracted epidemic, whose impact can however be mitigated through education campaigns, counseling of IV drug abusers, and a compassionate approach to those afflicted with AIDS.

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TABLE 1

Cumulative AIDS cases reported by 30 European countries and  
estimated cumulative incidence rates per million population  
31 June, 1988

COUNTRY	AIDS Cases	Rates per million population
Albania	0	0.0
Austria	191	25.1
Belgium	368	37.2
Bulgaria	3	0.3
Czechoslovakia	11	0.7
Denmark	292	57.3
Finland	32	6.5
France	4,211	75.7
German, Dem. Rep.	6	0.4
Germany, Fed. Rep.	2,210	36.2
Greece	127	12.7
Hungary	13	1.2
Iceland	6	30.0
Ireland	49	14.0
Israel	65	14.8
Italy	2,094	36.5
Luxembourg	12	30.0
Malta	12	30.0
Netherlands	539	36.9
Norway	88	21.0
Poland	3	0.1
Portugal	139	13.5
Romania	8	0.3
San Marino	0	0.0
Spain	1,471	37.7
Sweden	205	24.4
Switzerland	502	76.1
United Kingdom	1,598	28.1
USSR	4	0.0
Yugoslavia	40	1.7
<b>TOTAL</b>	<b>14,299</b>	<b>18.4*</b>

Source: WHO (1988c).

\* The overall rate is 28.5 if the USSR, which has only 3 cases, is excluded.

TABLE 2

Estimated prevalence of HIV infection  
January 1988

COUNTRY	Number of known infectives	<u>Estimated prevalence of HIV infection (in thousands)</u>		
		Maximum	Minimum	Best estimate
Albania	0	-	-	-
Austria	>1,573	-	-	-
Belgium	2,500	12,000-15,000	2,500-6,000	7,000-9,000
Bulgaria	48	300	100	200
Czechoslovakia	84	>1,000	100	>1,000
Denmark	1,400	20,000	5,000	10,000
Finland	201	1,000	500	500
France	>3,073	250,000	150,000	200,000
German, Dem. Rep.	40	300	150	200
Germany, Fed. Rep.	19,000	120,000	30,000	50,000
Greece	3,000	9,000	4,000	7,000
Hungary	148	5,000	1,000	2,500
Iceland	30	-	-	-
Ireland	678	1,500	678	1,000
Israel	305	4,700	305	2,200
Italy	7,480	100,000	20,000	50,000
Luxembourg	20	-	-	-
Malta	24	-	-	-
Monaco	10	-	-	-
Netherlands	>637	20,000	15,000	-
Norway	571	4,500	2,000	3,200
Poland	52	10,000	3,000	5,000
Portugal	363	5,000	500-1,000	2,500
Romania	16	-	-	-
San Marino	7	40	7	-
Spain	>1,300	100,000	24,000	60,000
Sweden	>1,400	5,000	3,000	5,000
Switzerland	>5,000	30,000	5,000	20,000-30,000
United Kingdom	8,016	80,000	24,000	40,000
USSR	44	250	100	-
Yugoslavia	700	4,000	1,500	2,500
<b>TOTAL</b>	<b>&gt;57,741</b>	<b>800,000</b>	<b>280,000</b>	<b>480,000</b>

Source: WHO Strbske Pleso Meeting (Czechoslovakia). February 1988.

TABLE 3

Prevalence of serum antibodies against HIV, selected studies.

Country Reference	Size, Population (Year)	% with HIV antibodies
<b>Austria</b> (Fuchs <i>et al.</i> , 1985)	34 imprisoned drug users (1985)	44
<b>Denmark</b> (Kolby <i>et al.</i> , 1986)	737 persons at AIDS screening clinics	
	homosexuals	36
	bisexuals	14
	heterosexuals	4
	females	4
<b>Fed. Rep. of Germany</b> (Schneider <i>et al.</i> , 1986)	6,720 blood donors (1984)	0.2
<b>France</b> (Brenky-Faudeux and and Fribourg-blanc, 1985)	50 prostitutes	0
Petithory <i>et al.</i> , 1986)	100 IV drug abusers (Sept. 85-March 86)	51
(Ancelle <i>et al.</i> , 1987)	4,100,000 blood donors (1986)	0.042
(DGS, 1987)	5,719 pregnant women (1987)	2
<b>Greece</b> (Papaevangelou <i>et al.</i> , 1985)	200 registered prostitutes (1985)	6
	10,000 blood donors (1985)	0
<b>Italy</b> (Ferroni <i>et al.</i> , 1985)	183 IV drug abusers (1979-1981)	2
	265 IV drug abusers (1982-1983)	29
	271 IV drug abusers (1984-1985)	35
(Tirelli <i>et al.</i> , 1985)	24 IV drug abusing prostitutes	71
	38 non drug abusing prostitutes	0
	95 male IV drug abusers	52
	30 homosexuals	15
(Luzi <i>et al.</i> , 1987)	18,000 IV drug abusers	
	in northern Italy	54
	in central Italy	39
	in southern Italy	26
<b>Netherlands</b> (Cramer, 1986)	145 IV drug abusers (1983-1984)	3.4
	52 addicted prostitutes	23
(van Griensven, 1987)	741 healthy homosexuals (Oct. 84-May 85)	31

<b>Spain</b>			
(WHO, 1986)	538	IV drug abusers (1985)	64
	226	homosexual and bisexual men	13
	297	hemophiliacs	68
	5	children of seropositive women	60
(Andres Medina, 1988)	150,000	blood donors (1986)	0.06
	300,000	blood donors (1987)	0.03
<b>Switzerland</b>			
(Schupbach <i>et al</i> , 1985)	103	IV drug abusers, Zürich (1984)	36
	40	healthy homosexual men	10
(Mortimer <i>et al</i> , 1985)	93	IV drug abusers, Bern (1979-1981)	0
	128	IV drug abusers, Bern (1982-1983)	16
	75	IV drug abusers, Bern (1984-1985)	37
<b>United Kingdom</b>			
(Gunson and Rawlinson, 1988)	5,840,520	blood donors (Oct 85- Dec 87)	0.0016
(Robertson <i>et al</i> , 1986)	164	IV drug abusers, Edinburgh (1986)	51
(Follett <i>et al.</i> , 1986)	606	IV drug abusers, Glasgow (1985)	5
(Jesson, 1986)	4,035	healthy homosexuals	21
	1,847	hemophiliacs	31
	239	IV drug abusers	10

TABLE 4

PREDICTED CASES OF AIDS TO DECEMBER 1989: ALL RISK GROUPS COMBINED

COUNTRY	Cases diagnosed up to 31 Dec 87		Estimated current doubling time <sup>3</sup> (months)	Cumulated cases projected <sup>4</sup> to be diagnosed by:	
	Rep. <sup>1</sup>	Adj. <sup>2</sup>		31 Dec 88	31 Dec 89
Austria	139	145	9.3 *	334 *	808 *
Belgium #	126	158	18.2 **	258 **	424 **
Denmark	228	245	16.2	425	725
France	3073	4273	10.5	9512	21101
F.R. Germany	1669	1883	13.9	3557	6606
Greece	88	88	8.6	222	582
Italy	1411	1788	9.2	4545	11341
Netherlands	420	452	13.4	859	1617
Norway	70	70	14.3	130	238
Portugal	90	106	***	***	***
Spain	789	1244	8.6	3329	8750
Sweden	163	172	***	***	***
Switzerland	355	381	16.9	660	1116
United Kingdom	1227	1804	11.6	3717	7595
E.C. ##	9164	12092	11.0	26240	56400

1: as reported by 31 Dec 1987

2: as estimated ("adjusted") to allow for delays in reporting

3: estimated by fitting an exponential model to (adjusted) cases diagnosed over the last 3 years

4: obtained by extrapolation using the estimated current doubling time

# residents only (Belgium) ## European Community (model using pooled data)

\*  $0.80 \leq R^2 < 0.90$ , \*\*  $0.70 \leq R^2 < 0.80$  \*\*\*  $R^2 < 0.70$  (in all other cases,  $R^2 \geq 0.90$ )

Source: Downs et al, 1988

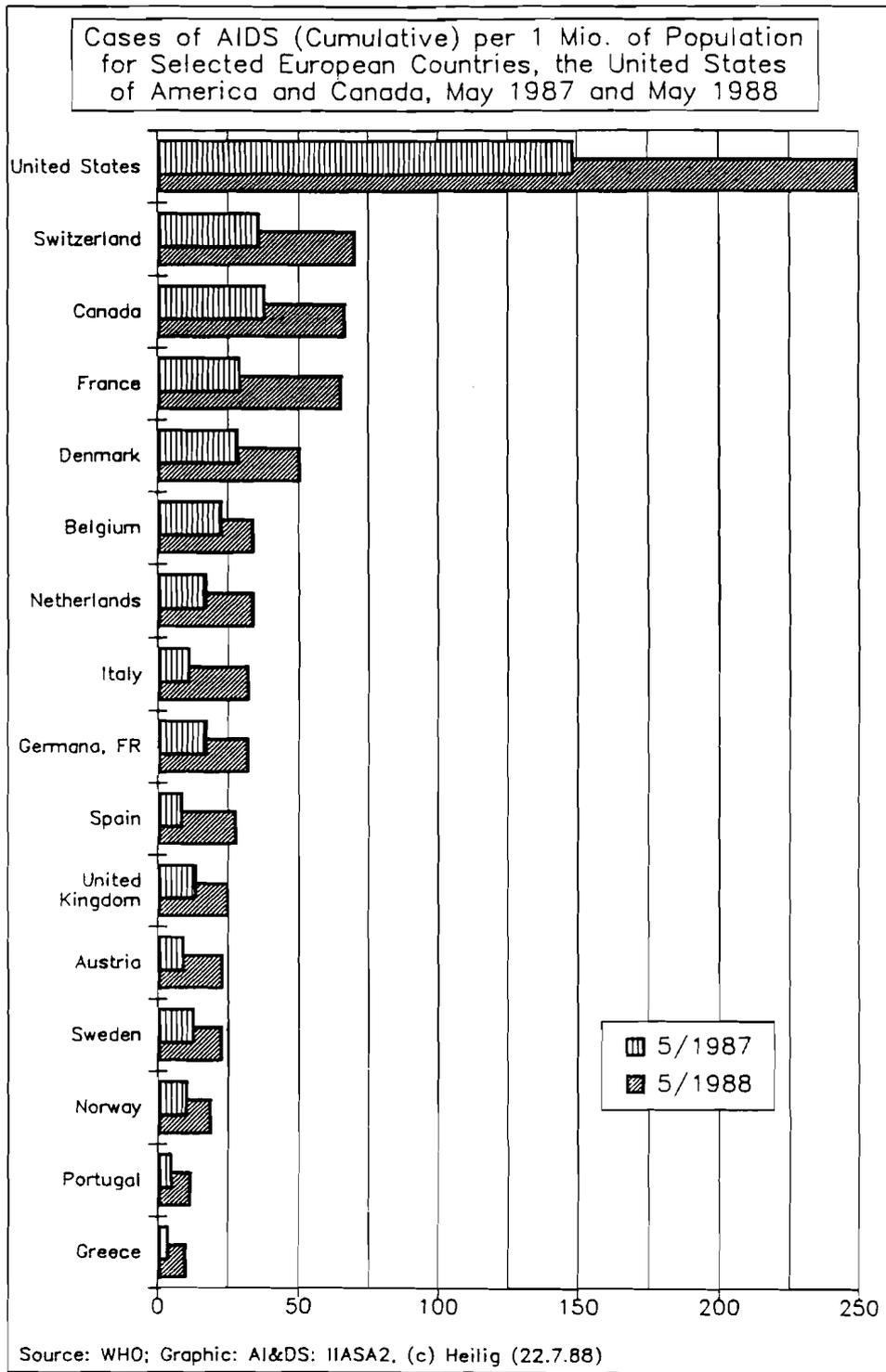
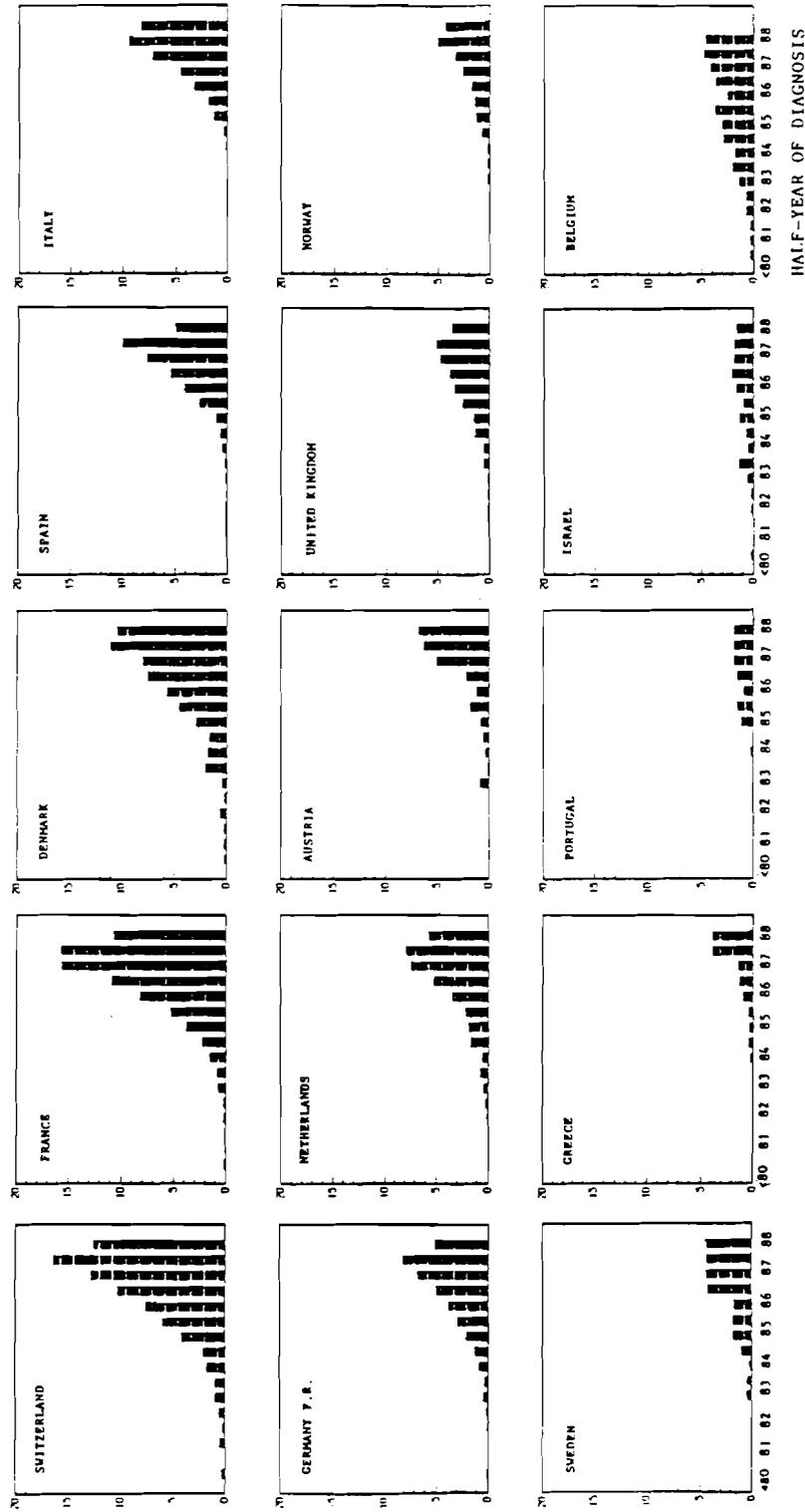


FIGURE 1

AIDS - INCIDENCE RATES PER MILLION POPULATION BY HALF-YEAR OF DIAGNOSIS  
31ST MARCH 1988



\* Countries with total number of cases  $\geq 50$

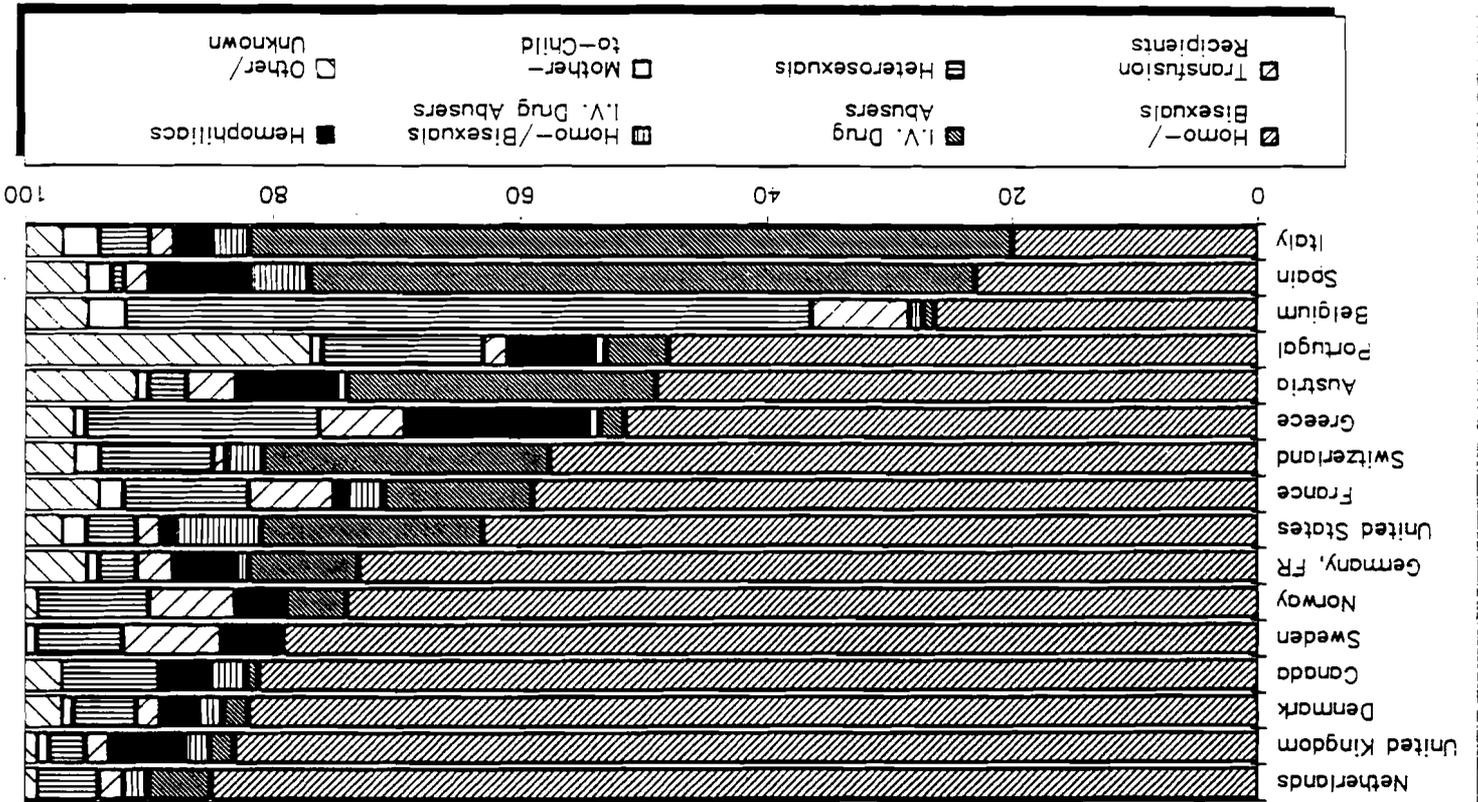
FIGURE 2

Source: WHO, 1988c

RATES PER MILLION POPULATION

FIGURE 3

Cases of AIDS (Cumulative) by Transmission Categories for Selected Countries of Europe, the United States of America and Canada (March 31, 1988)



Sources: WHO/CDC/FCA; Grobnie: AIDS: IASAT, Heilig (21.7.88)

Percent of cases in each risk group; by year of diagnosis

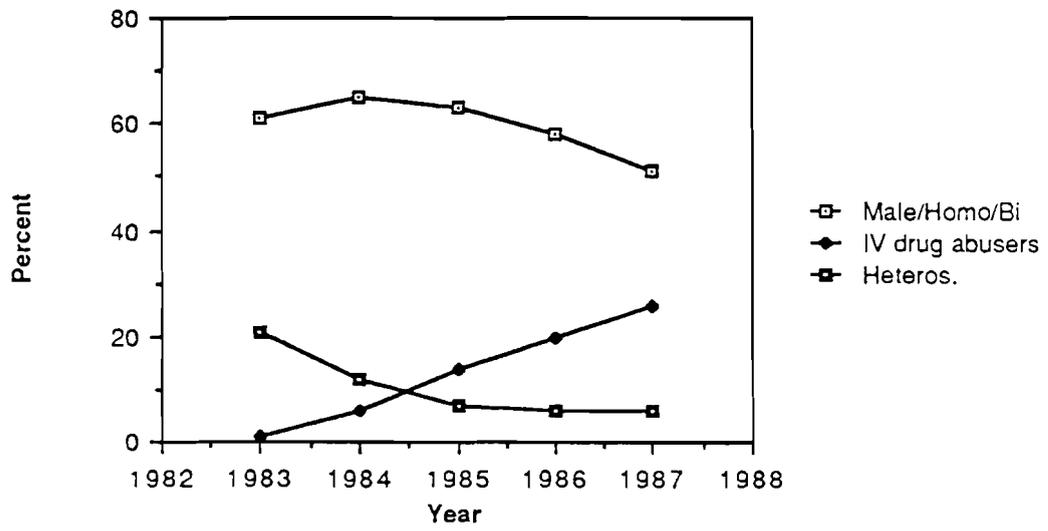
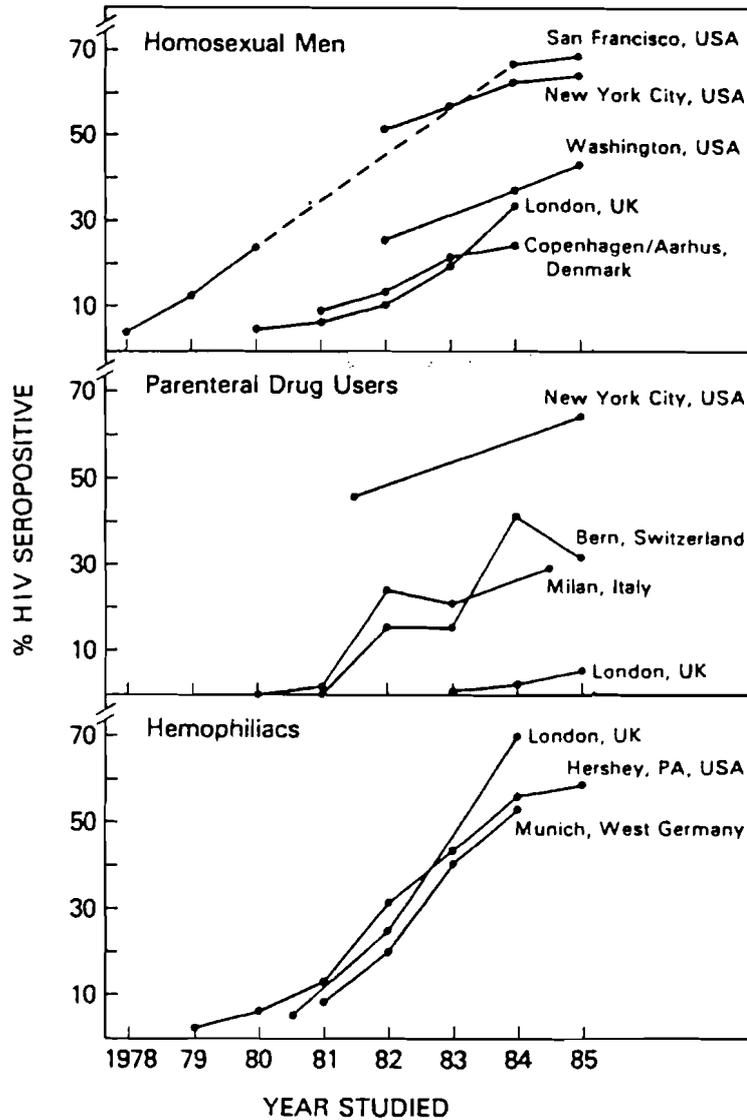


Figure 4

Fig. 5: Proportion of HIV infected persons by selected high-risk groups and geographical location according to various surveys.



Source: Melbye, M. / Goedert, J.J. / Blattner, W.A. (1987): The natural history of Human Immunodeficiency Virus Infection. In: Gottlieb, M.S. et al. (eds.): Current Topics in AIDS. Vol. 1, 57-93, (64)

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