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HIV infection in England and Wales: a changing pattern

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SUMMARY

Of 32983 specimens from 307 sources in England and Wales tested in the Virus Reference Laboratory for anti-HIV between 1984 and 1987, 6491 (20%) were positive. Ninety-five per cent of the positive subjects were male and 44% of them were from three London genito-urinary medicine clinics. In 1987 the numbers of newly diagnosed HIV infections decreased in homosexual men and haemophiliacs and increased in injecting drug abusers; 148/1199 (12%) of all the positive findings in 1987 were in females. Between 1984 and 1987 the proportion of anti-HIV positive individuals who were asymptomatic fell by nearly 10% and the proportion with AIDS/ARC rose by nearly 10%. Of the requests leading to positive results 1280 (20%) were recognized as duplicates of previous positive results, while for 34% of the requests no clinical information was provided. These deficiencies in the data compromise HIV surveillance based on diagnostic testing, and supplementary bias-free data are needed.

INTRODUCTION

In 1984 the Virus Reference Laboratory did a retrospective anonymous study of those groups thought to be at increased risk of human immunodeficiency virus (HIV) infection (Mortimer *et al.* 1985) and began diagnostic testing for antibody to HIV (anti-HIV). A computer database for test requests was set up and data from it for the years 1984–7 are presented and analysed here. Our report concentrates on the seropositive findings that arose from primary and confirmatory testing.

METHODS

Clinical and laboratory data

Clinics and laboratories were asked to complete a standard anti-HIV request form seeking outline clinical and epidemiological information on each patient. Some requests were received on non-standard forms and on some information had been partially or wholly withheld. Data were entered on a computer using the *DataEase* programme, and key fields in the data base were verified by double entry. Repeat testing on individuals was identified by comparing name or clinic number and date of birth, and repeat positive findings were excluded from the analysis. The clinical details given were used to categorize HIV infection according to the Centers for Disease Control classification (Centers for Disease Control, 1986).

Anti-HIV assays

Until mid-1985 competitive radioimmunoassay (RIA) and immunofluorescence (IF) assays were used (Mortimer *et al.* 1985). Thereafter capture RIA (Parry, 1986) and commercial indirect ELISA (at first Elavia, Pasteur Diagnostics, supplied by Northumbria Biologicals, Framlington, UK; after October 1987 Abbott rDNA ELISA, Abbott Diagnostics, Maidenhead, UK) were used instead of IF together with some testing by Western blot and particle agglutination (Fujirebio, Serodia HIV, supplied by Mast Diagnostics, Bootle, Merseyside, UK)).

Confirmation of initially positive reactions was based on positive results in multiple assays.

RESULTS

Of 32983 specimens examined 13095 were referred from other Public Health Laboratory Service laboratories. Three London genito-urinary medicine (GUM) clinics together sent 9723 specimens, and further specimens came from 304 sources throughout England and Wales.

Almost 20% (6491) of the specimens were anti-HIV positive and 80% (5211) of these were from individuals who, as far as could be ascertained, had not previously been found to be anti-HIV positive. The number of specimens tested fell in 1986 and 1987 reflecting the increasing activity of other diagnostic laboratories, but the proportion of specimens that were positive (about 20%) and the proportion that were new diagnoses (about 15%) remained stable (Table 1). Of the new positive findings, 2301 (44%) were patients from the three GUM clinics referred to above.

The new anti-HIV positive patients were predominantly (95·0%) male, but in 1987 12·0% were female. The male:female (M:F) ratio for specimens fell from 174 in 1984 to 8·1 in 1987. Of the 169 seropositive females whose age was known. 82% were 15–34 years old compared with 60% of the seropositive males.

Although homosexuals and haemophilia patients were the largest male risk groups, HIV infection in males involved several other groups including injecting drug abusers, those with African connections and, in small but increasing numbers, heterosexuals (Table 2). The numbers of seropositive males who were injecting drug abusers rose from 25 in 1984–5 to 71 in 1986 and 74 in 1987. By contrast, in 1987 new diagnoses in homosexuals were 19% fewer than in 1986 and 39% fewer than in 1985.

Among anti-HIV positive women an increasing incidence was seen in injecting drug abusers, those with African connections and those with many sexual partners or with a sexual partner himself at increased risk of HIV infection (Table 3). Twenty-five infants of HIV-infected mothers were found to be positive during the study period, 2 in 1985, 7 in 1986 and 16 in 1987.

The proportion of anti-HIV positive patients who were asymptomatic fell from 55% in 1984–5 to 47% in 1987, and the proportion with AIDS or AIDS-related complex (ARC) rose from 16 to 25% (Table 4). Of the seropositive males 51%, and of the seropositive females 66%, were asymptomatic. While the M:F ratio for all patients on whom there was clinical information was 20·7 it was 42·8 for

Table 1. *Summary of anti-HIV testing in Virus Reference Laboratory*

Year	Specimens received	Anti-HIV positive (%)	New anti-HIV positive (%)	Male/female ratio of new anti-HIV positives
1984	2354	446 (18·9)	349 (14·8)	173·5 : 1
1985	13948	2543 (18·2)	2122 (15·2)	66·9 : 1
1986	8314	1771 (21·3)	1367 (16·4)	17·1 : 1
1987	8367	1731 (20·7)	1373 (16·4)	8·1 : 1
Total	32983	6491 (19·7)	5211 (15·8)	19·1 : 1*

* For 55 anti-HIV positive individuals the sex was not known.

Table 2. *Ranked risk groups of newly diagnosed anti-HIV positive males, 1984–7**

	1984†	1985	1986	1987	Total
Homosexual	181	1286	970	786	3223
Clotting factor recipients	113	473	60	34	680
IV drug abuser	2	23	71	74	170
Lived in Africa/African	1	9	11	23	44
History of transfusion	0	3	9	5	17
Heterosexual	0	3	2	11	16
Multiple risks	1	7	9	22	39

* Blood donors and infants excluded. There was insufficient data to classify 644 positive males.

† Figures for last quarter only.

Table 3. *Ranked risk groups of newly diagnosed anti-HIV positive females, 1984–7**

	1984†	1985	1986	1987	Total
IV drug abuser	0	6	28	39	73
Lived in Africa/African	0	6	4	52	62
Sexual contact of at-risk male	2	5	16	20	43
Multiple sexual partners	0	1	5	11	17
History of transfusion	0	0	2	5	7
Clotting factor recipients	0	4	1	1	6
Multiple risks	0	1	1	2	4

* Blood donors, infants excluded.

† Figures for last quarter only.

patients with persistent generalised lymphadenopathy (PGL) and 27·3 for patients with AIDS/ARC.

No clinical information was provided on 1775 seropositive patients (34%), comprising 1647 males, 96 females and 32 of unknown sex.

DISCUSSION

Although only 49 cases of AIDS had been reported to the Communicable Disease Surveillance Centre (CDSC) by mid 1984 when antibody testing began (Tillett *et al.* 1988), HIV infection was already common among British

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Table 4. *CDC disease category of newly diagnosed anti-HIV positive individuals on whom clinical details were provided*

	Number with clinical data	CDC 1 (acute infection)	CDC 2 (no symptoms)	CDC 3 (PGL)	CDC 4 (ARC/ AIDS)	Other*
All Patients†:						
1984/5	1469	9	809	317	234	53
1986	963	19	504	202	144	94
1987	1004†	10	469	183	246	93
All males	3253	35	1665	685	600	240
All females	160	2	105	16	22	15
M:F ratio	20·3:1	17·5:1	15·9:1	42·8:1	27·3:1	16·0:1

* Skin conditions and other unclassifiable clinical features.
† Data includes 23 individuals whose sex was unknown.

homosexuals, especially in London (Mortimer *et al.* 1985; Cheinsong Popov *et al.* 1984). Since then continuing testing for anti-HIV has confirmed that cases of AIDS and ARC are outnumbered by cases of less severe HIV related disease and by asymptomatic infection. In our data these were only in the proportions 1·0:1·6:2·9, but asymptomatic cases will be under-represented in a study based on diagnostic testing. Our data also strongly suggest that the HIV epidemic in England and Wales is most advanced in Central London: 2301 (44%) of the new positive findings were from the 9723 specimens from patients of the three London clinics.

During the study there were important shifts in the occurrence of new infections. After heat-treated clotting factor concentrates were introduced in 1985, the incidence of HIV infection in haemophilia patients fell sharply. The numbers of infections also fell in male homosexuals in 1986 and 1987, presumably reflecting their increasing awareness of HIV risk but also possibly because men less at risk and without symptoms have come forward to be tested more recently. Nevertheless, by 1987, seropositive males in our study were more than twice as likely as females to have persistent generalized lymphadenopathy and the proportion of new seropositive patients with ARC and AIDS had risen to nearly a quarter. These were changes largely due to emergent disease in homosexuals.

In 1987, 12% of new seropositives were female. Most were women in their main child-bearing years and this development was accompanied (though total numbers were small) by an increase in tests done on infants born to seropositive mothers. Also in 1987, there was a rise in the numbers of anti-HIV positive drug abusers and of seropositive individuals who were from Africa or who had had sexual contact with Africans.

As the British HIV epidemic grows it is becoming increasingly hard to quantify and characterize it. Reasons for this include the frequency of unrecognizable duplicate testing due to the reluctance of many clinicans to identify patients and describe their illnesses when asking for laboratory tests to be done. Under-reporting of new positive HIV findings to the Communicable Disease Surveillance Centre (to which all positive laboratory findings should be reported) is probable and under-recognition of AIDS and other HIV-related disease suspected (McCormick, 1988). It is therefore difficult to be sure how many individuals have

been tested for anti-HIV, found to be positive or found to have HIV-related disease, and it is unsound to base estimates of the number of seropositives in the country or even the amount of HIV-related disease on the results of diagnostic tests. Diagnostic data can reveal trends with time and can suggest new features of the epidemic, but they cannot provide absolute figures because unknown numbers of infected individuals remain unrecognized and untested.

There is a need for HIV surveillance that overcomes the difficulties inherent in studies based on diagnostic testing. However, it is doubtful whether the proposed British sero-epidemiological studies based on informed consent to testing (Report, 1988) can provide bias-free population samples. Techniques are available for economical anonymous testing of large populations for HIV infection (Parry & Mortimer, 1988) and this approach is being tried in the United States without informed consent being required (Goldsmith, 1988). In this way bias may be avoided.

The evidence in this paper and elsewhere that the British epidemic is altering in character and has begun to involve many drug users, young women and heterosexual men points to a special need for accurate studies in these groups. Concern about confidentiality and the protection of individuals rights may render some of these approaches impossible, but the epidemic must be characterized and ways consistent with rights and personal privacy found to measure its size and progress.

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