CDR REVIEW

Volume 2
Review Number 8
17 July 1992
ISSN 0144-3186

Communicable Disease Review

Surveillance of HIV infection by voluntary testing in England

P A Waight, A M Rush, E Miller

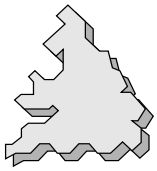
Summary

Eighteen laboratories, which together provide primary HIV antibody testing for 43% of the population in England, collaborated in a study to record epidemiological information for all individuals voluntarily tested by them over a five year period. From the 184,113 individuals who had a first test during the study period, it is estimated that 1 in 12 adults in London, and 1 in 50 outside London have been voluntarily tested for HIV since testing became widely available in 1985. The majority of those tested were individuals whose perceived risk was heterosexual exposure. Infection in this group was concentrated in individuals whose partner had an identified risk and in those who had lived in or visited Africa. The rise in antibody prevalence observed in the latter group during 1990/91 may have been partly due to infection recently acquired in the UK. Antibody prevalence in heterosexuals without a high risk partner or a history of exposure abroad also rose during the study period, suggesting a recent increase in transmission through casual heterosexual exposure in the UK. The study also provided strong evidence of continuing high risk behaviour among homosexual men, particularly in the younger age groups. Homosexuals aged under 30 years and living in London had the greatest risk of acquiring HIV infection since 1988.

Introduction

The surveillance of the spread of HIV infection in the United Kingdom relies on the voluntary reporting of AIDS cases and HIV infected individuals, and on large-scale unlinked anonymous seroprevalence surveys. The distribution of currently reported cases by region and exposure category reflects the pattern of infection some years ago, because of the long incubation period of AIDS. New reports of HIV infected individuals identified through voluntary testing reflect current transmission patterns more closely but also depend on the numbers tested in each exposure category. Unlinked anonymous testing provides seroprevalence estimates for sentinel groups in the population but is limited by the extent to which epidemiological information can be related to the sera tested, and by the composition of groups that can be sampled. Moreover, serial seroprevalence data can only provide an indirect estimate of the incidence of new infections.

To extend national surveillance, a collaborative study was set up in 1986 by the PHLS to record relevant epidemiological information for both HIV antibody positive and negative individuals tested voluntarily in selected laboratories in England[1]. The main objectives of the study are to enhance interpretation of data from HIV antibody positive reports, by providing information on the numbers tested according to exposure category; to provide an indication of seroprevalence in groups not sampled or categorised in the unlinked anonymous testing programme, and to provide direct estimates of incidence in selected high risk



Correspondence to: Editor CDR,
PHLS Communicable Disease Surveillance Centre,
61 Colindale Avenue, London NW9 5EQ
Tel: 0181 200 6868 Fax: 0181 200 7868 Telex: 8953942

Table 1 Prevalence of HIV antibody by exposure category: October 1986 - September 1991

Exposure category	Males		Females	
	Number tested	Number positive (%)	Number tested	Number positive (%)
Sexual intercourse				
Homosexual/bisexual	17685	1582 (8.9)	514	–
Heterosexual				
lived in/visited Africa	1970	134 (6.8)	1037	109 (10.5)
lived in/visited Americas	358	4 (1.1)	197	4 (2.0)
HIV positive partner	321	14 (4.4)	634	43 (6.8)
high risk partner*	1798	10 (0.6)	5317	32 (0.6)
moderate risk partner†	3427	5 (0.1)	3692	2 (0.1)
many partners	11527	21 (0.2)	14682	10 (0.07)
Injecting drug use	7031	184 (2.6)	3017	75 (2.5)
Blood				
Blood factor (eg, for haemophilia)	1022	60 (5.9)	141	–
Blood/tissue transfer (eg, transfusion)	1147	8 (0.7)	1483	9 (0.6)
Mother to infant	98	15 (15.3)	83	9 (10.8)
Other				
Multiple exposure categories	2059	92 (4.5)	745	18 (2.4)
Unspecified contact with HIV positive or at-risk person	2796	16 (0.6)	3320	12 (0.4)
Household contact/nursing/needlestick/ bite	440	–	405	–
No reported risk	46331	15 (0.03)	28039	8 (0.02)
Total	98010	2160 (2.2)	63306	331 (0.5)

* Partner bisexual, injecting drug user, lived in/visited Africa or haemophiliac

† Partner with many heterosexual partners, lived in/visited the Americas or transfusion/transplant recipient

groups. The results of the study to September 1991 are reviewed below.

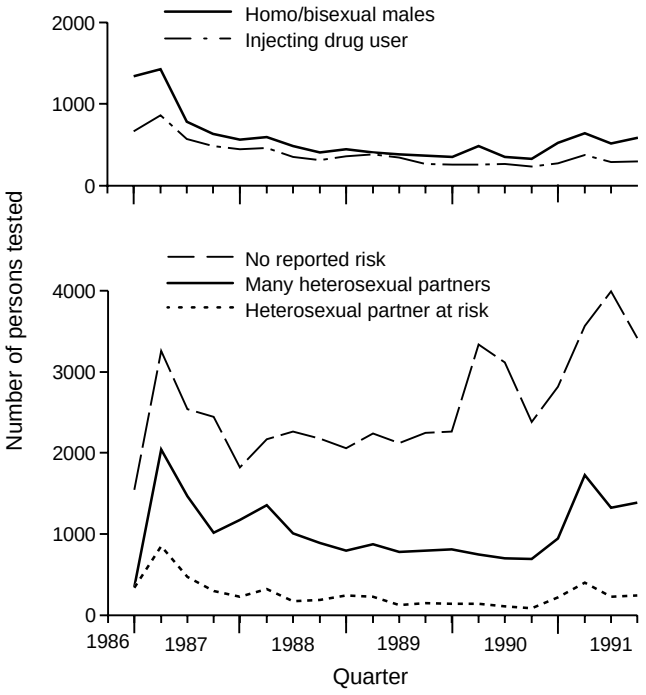
Methods

The study began in October 1986 with the recruitment of ten public health laboratories in England and was extended in 1988 to include a further eight laboratories, of which two were NHS laboratories. Four laboratories are in London and fourteen are outside (see list of collaborators). These 18 laboratories provide primary HIV antibody testing for a population of approximately 20 million individuals, 43% of the total population in England. All sera reactive in the initial assay were subjected to independent confirmatory testing. The methods used for data capture and analysis involved a specially designed HIV request form incorporating standard epidemiological and clinical questions that was distributed by each laboratory[2]. The information thus obtained was used to generate standard quarterly tabulations that were sent to CDSC for collation and analysis. Routine tabulations were restricted to individuals tested for the first time by the participating laboratory and contained no patient identifying information. Sera referred to the participating laboratory from other laboratories for confirmatory testing were excluded. Incidence data were obtained by identifying individuals who were initially seronegative and were tested again by the same laboratory during the study period[3]. Individuals whose second test was within one month of the first were excluded from the sero-incidence analysis, in order to eliminate those initially tested because of suspected recent infection. To ensure confident-iality, repeat-tested individuals were identified to CDSC by laboratory number only.

Results

During the five year period from October 1986 to September 1991, a total of 184,113 individuals (60% males; 39% females; 1% sex not known) were tested for the first time by the 18 study laboratories. Of these, 2727 (1.5%) were antibody positive. An estimated 0.2% of the population served by the laboratories had a first test each year during the study period. The proportion tested was higher in London than outside – yearly averages 0.7% and 0.2%, respectively. Ninety-eight per cent of individuals tested were more than 15 years of age, compared with 82% in the population as a whole. Forty-three per cent of requests for HIV tests were made at genitourinary medicine (GUM) clinics, 27% were made to general practitioners and 19% were at other hospital departments; there was

Figure 1 Number of persons tested for HIV antibody by exposure category at nine laboratories: October 1986 - September 1991



little change in the proportion of requests from each source over the period. Sixty-three per cent of the antibody positive patients were from GUM clinics, 23% from other hospital sources and 8% from general practitioners.

Information on exposure category was obtained for 161,316 (89%) of the 181,304 individuals whose sex was known. The largest groups were individuals with no reported risk (46%); heterosexuals with a history of many partners (16%), or heterosexuals whose partner was at risk of infection (9%) (Table 1). Homosexual or bisexual males and injecting drug users comprised only 11% and 6%, respectively, of the total tested, although 74% of the infected patients were in these groups.

Quarterly data were available for the entire five year period from nine laboratories. The number of requests from homosexual or bisexual males, injecting drug users and heterosexuals increased 2-5 fold in the first quarter of 1987, following the national AIDS information campaign which ran from October 1986 to April 1987. The number of requests increased again in the first quarter of 1991, particularly among those with no reported risk (Figure 1). Requests from this group also increased in the first quarter of 1990, following a national campaign by the Health Education Authority about the risk of acquiring HIV through casual heterosexual contact. The rise also coincided with the introduction of a requirement for HIV testing for emigrants to Australia.

The cumulative seroprevalence rates over the study period are shown in table 1, according to exposure category and sex of patient tested. Rates in homosexual/bisexual males, individuals who had lived in or visited Africa, injecting drug users, and in the heterosexual partners of individuals in these groups, were significantly higher in London than elsewhere (Table 2). The geographical differences in seroprevalence in the main exposure categories were evident whether individuals were tested at GUM clinics, other hospital departments or by general practitioners. Within each exposure category, seroprevalence was higher in patients tested at GUM clinics and hospitals than in those tested by general practitioners. Seroprevalence among 1615 women identified as pregnant was 0.5%, the same as for non-pregnant women. The main epidemiological features of the different exposure categories, including changes in seroprevalence over the study period, are summarised below.

Homosexual/bisexual males

Information on clinical state at the time of testing was obtained for 15,043 (85%) homosexual/bisexual males. Of these, 2754 (18%) had symptoms suggestive of HIV infection, such as lymphadenopathy, rash, weight loss and diarrhoea. Seroprevalence in this group was 3-6 times higher than in those without symptoms, and showed a significant increase over the five year period ($p < 0.0001$) (Figure 2). Analysis by age showed that the highest seroprevalence was in individuals aged 30-34 years in 1987 and in the 35-39 year age group in 1991 (Figure 3). In men under 20 years of age, the proportion positive increased from 2.4% (17 of 701) during 1987-90 to 4.7% (12 of 257) during the first nine months of 1991.

The incidence of new infections in homosexual/bisexual males, who had a repeat test during the study period, is shown in table 3. There was a difference in the trend in incidence rates over time between those tested inside and outside London ($p = 0.05$). Sixty-seven

Table 2 Proportion of persons found to be HIV positive in London and outside London: October 1986 - September 1991

	London			Outside London		
Exposure category	Number tested	Number positive	(%)	Number tested	Number positive	(%)
Homosexual/bisexual males	6061	907	(15.0)	11624	675	(5.8)
Lived in/visited Africa	1199	131	(10.9)	1808	112	(6.2)
Injecting drug use	1885	101	(5.4)	8163	158	(1.9)
Heterosexual with high risk partner	1427	17	(1.2)	5688	25	(0.4)
Many heterosexual partners	9569	12	(0.1)	16640	19	(0.1)
No reported risk	11143	10	(0.09)	63227	13	(0.02)

Figure 2 Proportion of homosexual/bisexual males found to be seropositive: October 1986 - September 1991

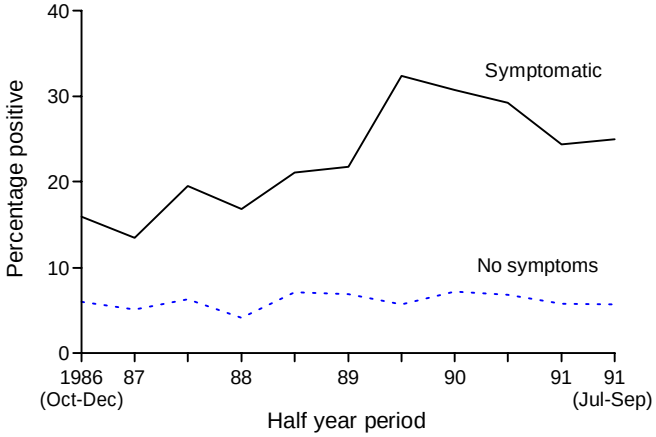
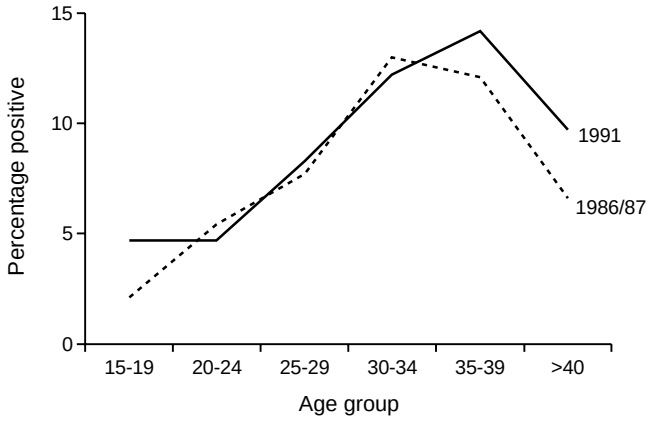


Figure 3 Proportion of homosexual/bisexual males found to be seropositive for HIV antibody by age group



individuals were found to have seroconverted after January 1988, including the 37 individuals listed in table 3, plus 30 individuals whose repeat sera did not fall in the two time bands 1988-89 or 1990-91. Figure 4 shows the ages of the 67 seroconverters and the age-specific incidence rates calculated for the period 1988-91. The age range was 16-58 years; the mean interval between negative and positive tests was 459 days (range 56-1134 days).

Heterosexuals who had lived in or visited Africa

Antibody prevalence among heterosexuals who had lived in or visited Africa increased markedly during 1990-91 (Table 4). The rise was evident both inside and outside London and in males and females. The majority of individuals in this group were aged 20-39 years and were asymptomatic when tested. The proportion with symptoms changed little over the five year period, from 21% in 1986/87 to 23% in 1990/91. Antibody prevalence among symptomatic individuals was 21%, compared with 4% among those without symptoms.

Other heterosexual groups

An increase was also observed in antibody prevalence among heterosexuals who had no history of residence in Africa. There were 54 antibody positive heterosexuals (36 males, 18 females) who had no reported risk or whose only identified risk was having many partners. In 15 cases (7 males, 8 females), infection was thought to have been acquired in other European countries or in Asia; a further two males were possibly infected by prostitutes in the United Kingdom. Detailed exposure histories of some of the 54 antibody positive heterosexuals have been reported previously[4].

Injecting drug users

Information about symptoms was obtained for 78% of the 10,048 injecting drug users tested. Seroprevalence in those with symptoms suggestive of HIV infection was 5.5% (97 of 1760) compared with 2.0% (123 of 6273) in asymptomatic individuals. There was no significant change in sero-prevalence among either asymptomatic or symptomatic drug users over the study period. Among individuals aged less than 20 years, seroprevalence declined from 1.6% (4 of 255) in 1986/87, to 0.4% (1 of 278) in 1988/89; none of the 230 individuals under 20 years of age tested in 1990/91 was positive.

Transfusion/transplant recipients

Seventeen infected patients were identified among the

Table 3 Incidence of HIV infection in homosexual/bisexual men in London and outside London: October 1986 - September 1991

	Number in cohort	Mean interval between tests (days)	Number of seroconversions	Incidence rate per 100 person years
London				
1986/87	286	286	7	3.1
1988/89	375	301	13	4.2
1990/91	402	277	17	5.6
Outside London				
1986/87	346	214	7	3.4
1988/89	265	234	3	1.8
1990/91	440	239	4	1.4

2630 transfusion or transplant recipients tested for HIV antibody (Table 1). None was infected after the introduction of HIV testing of blood products by the National Blood Transfusion Service; 3 of the 17 were transfused abroad. Eight presented with symptoms of advanced HIV disease.

Discussion

This is the largest documented survey, so far, of individuals in identified exposure categories who have been voluntarily tested for HIV infection. The number tested comprised nearly 1% of the population served by the study laboratories. The perceived risk for the majority of individuals tested was heterosexual exposure. Individuals at risk through homosexual or bisexual activity or injecting drug use comprised 17% of the total tested, but 74% of the total found to be infected. The study confirms the picture obtained through routine surveillance of antibody positive reports, ie, that the main foci of infection remain homosexual/bisexual men, particularly those in the London area, and injecting drug users[5].

Homosexual/bisexual males

Seroprevalence among homosexual/bisexual men attending GUM clinics was similar to that found in the unlinked anonymous prevalence monitoring programme, during 1990-91, among homosexual men not already identified as seropositive (A. Nicoll – personal communication). This suggests that there was no major participation bias among the homosexual or bisexual males who elected to have a voluntary named test. Nevertheless, changes in seroprevalence over time in this group should be interpreted with caution as they could be affected by changes in testing practices or in the population attending GUM clinics, particularly in the referral of patients with symptoms suggestive of HIV infection. Changes in symptomatology of patients referred to GUM clinics will also affect the results of unlinked anonymous prevalence surveys and thereby the indirect estimates of incidence derived from serial prevalence data. To help overcome this problem, limited clinical information is being obtained in the GUM limb of the anonymous survey to aid the interpretation of results. While the direct incidence estimates obtained in our study may not be representative, as homosexual or bisexual males having a repeat voluntary test are likely to be those at greatest risk, they are a cause for concern, particularly as the individuals who seroconverted had been tested previously and presumably counselled about risk reduction. The incidence rate among homosexual/bisexual males in London during 1990/91 was similar to the estimated rate among this group in the early years of the epidemic, before the documented change to safer sexual practices in 1984[6]. A behavioural study is now planned in order to identify the factors currently associated with seroconversion. In our study, residence in London and age were found to be important determinants, incidence rates being highest in those aged 20-24 years. The greater incidence in London will be attributable, in part, to the higher seroprevalence and the increased risk of a new sexual partner being positive.

Further evidence of continuing infection, particularly among younger homosexual men, comes from analysis of serial antibody prevalence data. In individuals aged less than 20 years, who became sexually active in recent years, prevalence more closely reflects current incidence. Prevalence in this group, which had remained at about 2% from 1986-90, rose to nearly 5% during 1991. The number of homosexual men presenting for testing was stable over the five year period (Figure 1) suggesting no major change in the testing threshold. The similar age-specific prevalence observed in homosexual men aged 20-34 years (Figure 3) is therefore consistent with continuing infection in subsequent cohorts; the upward shift in age of peak prevalence being the result of aging of the cohort of individuals who were most sexually active during the early years of the HIV epidemic. Overall, a significant rise in antibody prevalence over the study period was only observed in symptomatic homosexual men. It is to

Figure 4 Seroconversion to HIV in homo/bisexual males by age group: 1988-1991

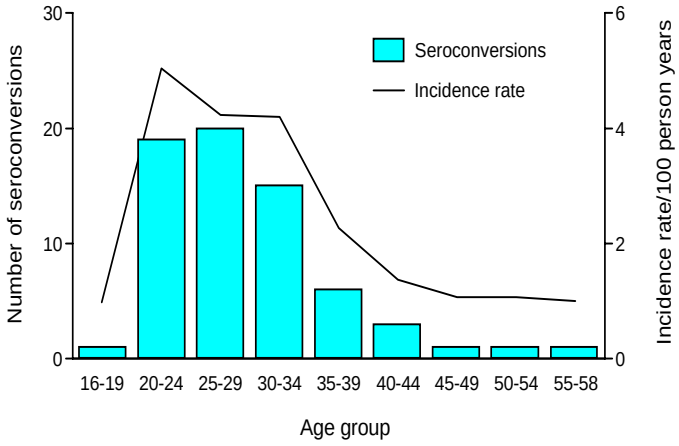


Table 4 Proportion of heterosexuals found to be HIV positive: October 1986 - September 1991

Exposure category	1986 - 1987 Number tested	1986 - 1987 Number positive (%)	1988 - 1989 Number tested	1988 - 1989 Number positive (%)	1990 - 1991 Number tested	1990 - 1991 Number positive (%)
Lived in/visited Africa	755	39 (5.2)	960	58 (6.0)	1292	146 (11.3)
Heterosexual with high risk partner	2277	11 (0.48)	2091	13 (0.62)	2747	18 (0.65)
Many heterosexual partners	6390	5 (0.08)	8667	10 (0.11)	11152	16 (0.14)
No reported risk	12443	1 (0.01)	23624	8 (0.03)	38303	14 (0.04)

be expected that as the number of homosexual males with HIV attributable disease increases, a greater proportion of those presenting with non-specific symptoms, such as weight loss and diarrhoea, will be infected. Antibody prevalence among asymptomatic homosexual men was stable over the period, which is consistent with the rate of new infection being maintained among the new cohorts presenting for testing.

Heterosexuals who had lived in or visited Africa

A marked rise in seroprevalence during 1990/91 was observed among heterosexuals who had lived in or visited Africa. There was no evidence that this was due to a change in testing practice (eg, the testing of proportionately more patients with symptoms of HIV infection), which suggests a real increase in seroprevalence in this group. This lends support to the suggestion[7] that the increase in seroprevalence found in antenatal women at some London centres included in the unlinked anonymous programme is, at least in part, associated with women from abroad. Infection of such individuals is usually attributed to heterosexual exposure abroad[8] and the rising prevalence is assumed to reflect the prevalence of HIV infection in the country of origin. However, three seroconverters (one man in 1989 and two women in 1991) were identified among 62 seronegative individuals who had lived in or visited Africa but who had repeat tests in London, suggesting that the increase in seroprevalence is partly due to infection acquired in the United Kingdom.

Other heterosexual groups

A rise in seroprevalence was observed among heterosexuals with no reported risk or whose only risk was a history of having many partners. Infection in these individuals may have been acquired from partners themselves infected by heterosexual intercourse ie, second generation transmission[8]. The increasing number of heterosexuals from these exposure categories requesting an HIV test is evidence of a growing concern about the risk of acquiring infection through casual sexual exposure. The rise in requests during the first quarter of 1991, after the revelation in January 1991 that one of the heterosexual characters in a national television 'soap opera' was HIV positive, suggests that the media could have an important influence on behaviour in this group.

Injecting drug users

Infection in this group, although well established in the populations served by the study laboratories, still appears to be contained. It was encouraging to find that antibody prevalence among young drug users declined over the five year period.

Conclusion

The collection of epidemiological information on antibody positive and negative individuals voluntarily tested for HIV provides a useful and logistically simple adjunct to national surveillance. The provision of 'denominator' data assists the interpretation of national reports of antibody positive individuals. The wide spectrum of exposure categories and referral sources sampled in this study allows an assessment of seroprevalence in categories not included in unlinked anonymous surveys. The study provides an estimate of the proportion of the total population voluntarily tested for HIV. From the average yearly testing rates observed over the study period, it can be estimated that approximately 1 in 12 adults (more than 15 years of age) in London and 1 in 50 outside London has had a named test since testing became widely available in 1985.

The study has also confirmed and extended conclusions, based on other surveillance methods, about the transmission of infection among homosexual or bisexual men, injecting drug users and heterosexuals. Of particular importance is the direct evidence of continuing high risk behaviour among homosexual/bisexual men as demonstrated by the incidence of new infections, and the indirect evidence of an increase in second generation heterosexual transmission in the United Kingdom, as demonstrated by the rise in seroprevalence among heterosexuals without a history of exposure abroad, injecting drug use or a high risk partner.

Survey collaborators

J Jones and J Q Nash (Ashford PHL); U Desselberger, J Mowbray and SJ Skidmore (East Birmingham Hospital); C Ashley and E O Caul (Bristol PHL); F Joyce and T G Wreghitt (Cambridge PHL); P Pandya, B Patel and M S Shafi (Central Middlesex PHL); T Lewis and R E Tettmar (Chelmsford PHL); P Holland and S Sutherland (Dulwich PHL); D Bright, T Riordan and J Walker (Exeter PHL); T J Coleman and M Curtis (Hereford PHL); R P Eglin, M H Hambling and P Rushton (Leeds PHL); A Blackley, J Craske and A J L Turner (Manchester PHL); C Khudabux, P Luton, R S Tedder and N Tenn (Middlesex Hospital Medical School and University College Hospital); K Cutter, M Sillis and P M B White (Norwich PHL); G Hewitt and G Underhill (Portsmouth PHL); P Hudson, P Morgan-Capner and J Wright (Preston PHL); G J Pinney, N J Sellwood and C Woods (Reading PHL); J Gray, R McEwan and N D Williams (Stoke PHL); P Mortimer and J Richmond (PHLS Virus Reference Laboratory, Colindale).

References

1. PHLS Working Group. Prevalence of HIV antibody in high and low risk groups in England. *BMJ* 1989; **298**: 422-3.
2. Kaye PA. PHLS collaborative HIV study. *PHLS Microphile* 1990; **1**: 2-6.
3. Waight PA, Miller E. Incidence of HIV infection in homosexual men in England during 1986/87 and 1988/90. *BMJ* 1991; **303**: 311.
4. Gilbart VL, Evans BG, Mortimer JY, Noone A, Gill ON. Second generation heterosexual transmission of HIV-1 infection. *Communicable Disease Report* 1992; **2**: R55-9.
5. PHLS AIDS Centre, Communicable Disease (Scotland) Unit. Quarterly surveillance tables; September 1991: 13.
6. Carne CA, Weller IVD, Johnson AM, Loveday C, Pearce F, Hawkins A, et al. Prevalence of antibodies to human immunodeficiency virus, gonorrhoea rates, and changed sexual behaviour in homosexual

From the briefcase to the bookshelf: information sources for communicable disease control

D Morgan, M O'Mahony, R E Stanwell-Smith

The consultant in communicable disease control (CCDC) is responsible for the surveillance and control of communicable disease and infection[1], and is required to respond promptly to requests for information, guidance and help on a wide range of topics. These include outbreaks of infection, toxic incidents, port health issues, travel advice, control of hospital infection, HIV infection, safety of food and water, immunisation, surveillance data and zoonoses. The legal background to many of these activities and the role of the CCDC have been discussed in recent publications[2,3]. Various organisations have held courses for those training in communicable disease control. It has become apparent that trainees in public health medicine; newly appointed CCDCs, and other doctors involved in communicable disease control, need advice about information sources for routine and emergency use. This selection is offered as a beginner's guide but may also be of interest to more experienced doctors as a check list.

THE ON-CALL PACK (page R92)

These items have been selected for those performing out-of-hours on-call duties. 'Benenson' and the 'Pocket Consultant' give comprehensive summaries of communicable diseases, listed in alphabetical order. The Department of Health's 'green book' on immunisation covers most routine immunisation enquiries. Many publications dealing with specific infections are single sheets and can easily be incorporated into an on-call file. Leaflets can be useful for emergency distribution in community outbreaks (eg, that on meningitis obtainable from the Meningitis Trust, Fern House, Bath Road, Stroud, Glos. GL5 3TJ). Information about parasitic infections is available from Community Hygiene Concern (32 Crane Avenue, Isleworth, Middx. TW7 7JL). Leaflets are also produced by the Association of Medical Microbiologists on a variety of topics eg, campylobacter, cryptosporidiosis, influenza, legionnaires' disease, listeria, rabies, salmonella infections (with particular reference to eggs), and toxoplasmosis. These are supplied free to members of the Association but can also be purchased (from Dr EP Wright, Department of Microbiology, Royal East Sussex Hospital, Hastings, E Sussex TN34 1ER). Leaflets giving details about common or potentially serious infections are often produced locally by health and local authorities.

TELEPHONE CONTACTS (page R93)

It is also valuable to carry a list of work and home telephone numbers of colleagues involved in communicable disease control and contacts in relevant local organisations.

ELECTRONIC INFORMATION (page R93)

Electronic bulletin boards, viewdata services and information systems provide immediate and up-to-date sources of topical information and are making an increasing contribution to the control of communicable disease. They give immediate access to messages, hazard warnings, updates and databases and are more up-to-date than most printed publications, although they are often less comprehensive in their coverage.

THE BOOKSHELF (pages R94-5)

The 'Practical Guide for Medical Officers for Environmental Health' is a useful source of information and, although it is currently out of print, many departments of public health medicine still have a copy.

Travel advice including immunisation

Travel enquiries form an increasing part of the CCDC's workload and the sources included here, in conjunction with the on-call pack, should assist with most of these. Local travel clinics also provide specialist advice.

Legal aspects

The Public Health Act 1984 is a surprisingly 'good read', and the recent and proposed changes in various Acts and circulars are summarised in the consultation document on the 'Review of Law on Infectious Disease Control'.

Control of specific infections

These sources (in conjunction with the on-call pack) cover those diseases requiring public health action or those that frequently give rise to enquiries. Most districts have policies for the management of specific infections but the sources listed may help with their preparation or modification.

Hepatitis and HIV infection

Enquiries about hepatitis and HIV infection are sufficiently common to justify a separate list. These sources should assist in the development of local policies and guidelines, and with *ad hoc* problems, as they arise.

Toxicology and waste management

The service provided by the National Poisons Unit and the Edinburgh Poisons Centre as well as the sources listed in this article will assist with enquiries about non-infective hazards, and help the CCDC distinguish between toxic incidents and outbreaks of communicable disease.

Water and zoonoses

Public concern is increasing about water standards, contamination incidents and animals as sources of infection.

The sources listed contain much of the key information but further information is also available from the local and national centres listed on pages R92-3.

References

1. Anon. Committee of inquiry into the future development of the public health function. *Public Health in England*. London: HMSO, 1988 (Acheson report).
2. Department of Health. *Review of law on infectious disease control: consultation document*. London: HMSO, 1989.
3. Department of Health. *Communicable disease control*. London: HMSO, 1991. (Executive letter - EL (91) 123.)

The on-call pack

Benenson AS, editor. *Control of communicable diseases in man*. Fifteenth Edition. New York: American Public Health Association, 1990.

Emond RTD, Bradley JM, Galbraith NS. *Pocket consultant: infection*. Oxford: Blackwell, 1989.

Directory of Environmental Health Departments. Department of Health, 1992.

Directory of CCDCs and MOEHs – available from the Department of Health.

Department of Health, Welsh Office, Scottish Home and Health Department. *Immunisation against infectious disease*. London: HMSO, 1990. (1992 edition in press – the 'green' book.)

British Medical Association, Royal Pharmaceutical Society of Great Britain. *British National Formulary*. Number 23, March 1992.

Cartwright KAV, Begg NT, Hull D. Chemoprophylaxis for secondary *Haemophilus influenzae* type b disease. *Communicable Disease Report* 1991; **1**: R2-6.

UK Health Departments. *Guidance for clinical health care workers: protection against infection with HIV and hepatitis viruses*. Recommendations of the Expert Advisory Group on AIDS. London: HMSO, 1990.

PHLS Meningococcal Infections Working Party. The epidemiology and control of meningococcal disease. *Communicable Disease Report* 1989; (8): 3-6.

Begg NT. Control of meningococcal disease. *Communicable Disease Report* 1992; **2**: R65.

Watson JM, O'Mahony M. Legionnaires' disease – a recurring problem. *Health and Hygiene* 1990; **11**: 10-14.

Joint Tuberculosis Committee of the British Thoracic Society. Control and prevention of tuberculosis in Britain: an updated code of practice. *BMJ* 1990; **300**: 995-9.

PHLS Salmonella sub-committee. Notes on the control of human sources of gastrointestinal infections, infestation and bacterial intoxications in the United Kingdom. *Communicable Disease Report* 1990: Suppl 1.

Bradley DJ, Phillips-Howard PA. Prophylaxis against malaria for travellers from the United Kingdom. *BMJ* 1989; **299**: 1087-9.

World Health Organisation. *International travel and health: vaccination requirements and health advice*. Geneva: WHO, 1992. (the 'yellow' book.)

Department of Health, Central Office of Information. *Health advice for travellers*. T4 edition, 1992 (covers all countries including the European Community).

Murray V, editor. *Major chemical disasters – medical aspects of management*. Oxford: Royal Society of Medicine Services, 1990.

Assorted leaflets – sample copies (see page R91).

Local policies and plans eg, hospital control of infection policy; outbreak plan; major accident plan; county emergency plan; AZT policy for district; district immunisation plan, and policies for specific infections eg, meningitis, hepatitis, legionnaires' disease, etc.

Suggestions for improving and updating these sources are welcomed and should be sent to the Editor of the CDR.

Telephone contacts

Local colleagues:
- Infectious disease physicians
- Hospital infection control doctor
- Hospital infection control nurse
- District immunisation coordinator
- Environmental health department
- Public health medicine colleagues
- Microbiologists
- General practitioners
- Health authority solicitor
- Local authority solicitor
- District general manager
- District occupational health physician
- Press officer

Local services:
- Local hospitals
- Ambulance control
- Fire brigade
- State Veterinary Service
- Health and Safety Executive
- National Rivers Authority
- Local water company
- Travel clinics

Other services:
- Regional epidemiologist
- Regional director of public health medicine
- PHLS-CDSC
- PHLS-CPHL
- Department of Health
- National Poisons Unit
- National Radiation Protection Board
- MAFF
- Welsh Office

Electronic information

Network PHLS

This is a Public Health Laboratory Service electronic messaging system and viewdata service. It is held by all public health laboratories and many CCDCs. It enables users to exchange confidential information as text or computer files. Messages can be sent from one user or a group of users as the need dictates. The viewdata service gives disease reports, hazard warnings and summaries of surveillance data from CDSC, the Office of Population Censuses and Surveys and the Royal College of General Practitioners.
Enquiries to: Dr G Adak, Communicable Disease Surveillance Centre (telephone 081 200 6868).

Prestel

The Department of Health uses PRESTEL (page 50063) to issue warnings to travellers as well as changes to the Health Advice for Travellers leaflets.

Travax

This is compiled by the Communicable Diseases (Scotland) Unit and provides travel information. It is free to users within the NHS and gives recommendations for travel immunisations, malaria prevention, other disease risks and information about current problems. It also includes information on HIV infection, food and waterborne infections.
Enquiries to: Dr E Walker or Ms F Raeside, Ruchill Hospital, Glasgow G20 9NB (telephone 041 946 7120, ext 1277).

Poisons viewdata

This is compiled by the Edinburgh Poisons Centre and is accessed through Travax. It gives details on drugs, chemicals, pesticides, plants and household products and includes information on the ingredients or active substances in products, their toxicity, clinical features and treatment of poisoning. There is no charge for NHS users.
Enquiries to: Viewdata Services Manager, The Old Residency, The Royal Infirmary, Edinburgh EH3 9YW.

A communicable disease bookshelf

General

NHS Management Executive. Guidance to local authorities and health authorities: communicable disease control. London: HMSO, 1991. (EL(91)123/23.)

Johnston JK, Semple AB. *Practical Guide for Medical Officers for Environmental Health*. Nuffield Provincial Hospitals Trust, 1979.

Brès P. *Public health action in emergencies caused by epidemics*. Geneva: WHO, 1986.

Galbraith S, Palmer S. General epidemiology. In: Topley and Wilson's *Principles of bacteriology, virology and immunity*. Volume 3. Eighth edition. London: Edward Arnold, 1991: 11-29.

UK Health Departments. *Code of practice for the prevention of infection in clinical laboratories and post-mortem rooms*. London: HMSO, 1978.

Centers for Disease Control. Recommendations for occupational safety and health standards. *MMWR* 1988; **37**: SS-7.

Advisory Committee on Dangerous Pathogens. *Categorisation of pathogens according to hazard and categories of containment*. Second edition. London: HMSO, 1990.

Centers for Disease Control. Case definitions for public health surveillance. *MMWR* 1990; **39**: RR-13.

Tillet HE. Statistical analysis of case-control studies of communicable disease. *Int J Epidemiol* 1986; **15**: 126-33.

Anon. *The microbiological safety of food, part 1*. Committee on the Microbiological Safety of Food (Chairman – Sir Mark Richmond). London: HMSO, 1990.

Travel advice (including immunisation)

Walker E, Williams G. *ABC of healthy travel*. London: BMJ, 1989. (4th edition due 1992.)

Lea G. Advice for travellers. *Communicable Disease Report* 1992; **2**: R82-3.

Lea G, Begg NT. Prevention of flavivirus encephalitides in travellers to endemic areas. *Communicable Disease Report* 1991; **1**: R64-5.

List of District Health Authority travel clinics (available from Travel Unit, CDSC).

List of British Airways travel clinics (available on 071 831 5333).

Legal aspects

Public Health (Control of Disease) Act 1984. London: HMSO, 1984.

Public Health (Infectious Diseases) Regulations 1988. London: HMSO, 1988.

Department of Health. *Review of law on infectious disease control: consultation document*. London: HMSO, 1989

Food Safety Act 1990. London: HMSO, 1990.

UK Health Departments. *The Food Safety Act 1990 and you: a guide for the food industry*. London, 1991 (available from: Food Sense, London SE99 7TT).

Control of specific infections

Health and Safety Executive. *The control of legionellosis including legionnaires' disease*. London: HMSO, 1991.

Health and Safety Commission. *The prevention or control of legionellosis (including legionnaires' disease): approved code of practice*. London: HMSO, 1991.

Department of Health, Welsh Office. *The control of legionellae in health care premises services systems: a code of practice* (*updated*). London: HMSO, 1989.

Department of Health and Social Security. *Food poisoning: the investigation and control of food poisoning in England and Wales*. London: HMSO, 1982.

Miller E, Cradock-Watson JE, Ridehalgh MKS. Outcome in newborn babies given anti-varicella-zoster

(*Continued on page R95)*

immunoglobulin after prenatal maternal infection with varicella-zoster virus. *Lancet* 1989; **ii**: 371-3.

Hepatitis and HIV infection

Centers for Disease Control. Protection against viral hepatitis. Recommendations of the Immunisation Practices Advisory Committee (ACIP). *MMWR* 1990; **39**: RR-2.

Centers for Disease Control. Public Health Service statement on management of occupational exposure to HIV, including considerations regarding zidovudine post-exposure use. *MMWR* 1990; **39**: RR-1.

Centers for Disease Control. Recommendations for preventing transmission of HIV and hepatitis B virus to patients during exposure-prone invasive procedures. *MMWR* 1991; **40**: RR-8.

Occupational exposure to HIV and use of zidovudine. A statement from the Expert Advisory Group on AIDS. London: HMSO, 1992. (PL / CO(92)1.)

Advisory Committee on Dangerous Pathogens. HIV – the causative agent of AIDS and related conditions. January 1990.

UK Health Departments. *AIDS-HIV infected health care workers. Occupational guidance for health care workers, their physicians and employers*. Recommendations of the Expert Advisory Group on AIDS. December 1991. (available from: Health Publications Unit, No. 2 Site, Manchester Road, Heywood, Lancs. OL10 2PZ).

Hospital infections

Lowbury EJL, Ayliffe GAJ, Geddes AM, Williams JD, editors. *Control of hospital infection*. Second edition. London: Chapman and Hall, 1981.

Department of Health and Social Security. *Hospital Infection Control*. Guidance on the control of infections in hospitals. Prepared by the joint DHSS / PHLS Hospital Infection Working Group. 1988 (available from the Health Publications Unit – see previous section).

Toxicology and waste management

Department of Health and Social Security. *Pesticide poisoning. Notes for the guidance of medical practitioners*. London: HMSO, 1983.

Department of the Environment. *Waste management paper number 25: clinical wastes*. London: HMSO, 1987.

Water

Department of the Environment, Department of Health and Social Security, Public Health Laboratory Service. *The bacteriological examination of drinking water supplies 1982*. Reports on Public Health and Medical Subjects No. 71. London: HMSO, 1983.

Anon. *Cryptosporidium in water supplies*. Report of a Group of Experts. London: HMSO, 1990 (Badenoch Report).

Department of the Environment, Welsh Office. *Guidance on safeguarding the quality of public water supplies*. London: HMSO, 1990.

Zoonoses

Bell JC, Palmer SR, Payne JM. *The zoonoses*. London: Edward Arnold, 1988.

Department of Health and Social Security, Welsh Office. *Memorandum on rabies*. London: HMSO, 1977.

Department of Health and Social Security, Welsh Office. *Memorandum on the control of viral haemorrhagic fevers*. London: HMSO, 1986.

Hall SM. What is toxoplasmosis and how can it be prevented? *Shared Wisdom, Journal of Community Hygiene Concern* 1991; issue 2: 20-1.

Anon. *Prenatal screening for toxoplasmosis in the UK*. Report of a Multidisciplinary Working Group. Royal College of Obstetricians and Gynaecologists. London, 1992.

The quarterly communicable disease reviews prepared by CDSC and published in the *Journal of Public Health Medicine* provide brief updates on areas of topical interest. Subjects covered during 1991 included: AIDS and HIV infection, blood-borne viruses in the health care setting, cholera, dysentery, imported infections, listeriosis, mumps and MMR vaccine, poliomyelitis, rabies, rubella and pregnancy, salmonella food poisoning, sexually transmitted diseases, and tuberculosis (*J Publ Health Med* 1991 / 2; **13**: 219-25 & 332-41; **14**: 84-92 & 206-14).

Suggestions for improving and updating these sources are welcomed and should be sent to the Editor of the CDR.

'COVER' (Cover of vaccination evaluated rapidly): 22

The COVER programme, a scheme for the rapid evaluation of vaccine coverage, started in January 1987 with 14 districts contributing data (*Communicable Disease Report* 1987; (12): 3-6). This twenty-second quarterly report includes information from 185 districts.

Methods

The data were collected at the beginning of May 1992. Vaccination data were requested for quarterly cohorts whose youngest member had reached the target ages for completion of immunisation: 18 months for the third dose of diphtheria (D3) and pertussis (P3) vaccines and 24 months for measles. For D3 and P3, data were also requested for quarterly cohorts whose youngest member had reached a lower target age of 12 months. The cohorts studied were those born in January to March 1991 (for D3 and P3 by 12 months), July to September 1990 (for D3 and P3 by 18 months) and January to March 1990 (for measles by 24 months).

Results

Altogether, 185 districts participated from 14 English regions, Wales and Northern Ireland. Data were available for every district in seven English regions, Wales and Northern Ireland. In all other regions (except Trent and Mersey) at least 80% of districts participated. The average cover* by 12 months was **93%** for D3 (district range 75-98%) and **89%** for P3 (district range 70-97%). Cover by 18 months was **94%** for D3 (district range 70-99%) and **90%** for P3 (district range 68-96%). For measles, average cover by 24 months was **92%** (district range 65-99%).

Comment

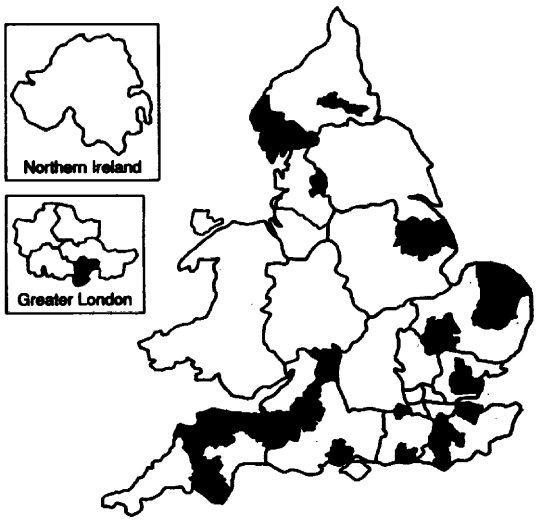
We report COVER data from 185 of 198 (93%) districts in England, Wales and Northern Ireland. Vaccine coverage has improved by 1% for both D3 (12 months) and P3 (18 months) since the previous report. Measles coverage (24 months) has also improved by 1%. For the first time, 90% coverage has been achieved nationally for all antigens. The new target of 95% coverage has been achieved by 120 districts for D3 at 18 months (Figure 1a), 20 districts for P3 at 18 months (Figure 1b) and 65 districts for measles at 24 months (Figure 1c). Seven English regions (Northern, Yorkshire, Trent, East Anglia, Wessex, Oxford and South Western) and Northern Ireland have average coverage levels of 90% or more for all the antigens evaluated and, in one of these regions (South Western), every district achieved 90% or more for all antigens. At the other end of the spectrum, coverage was below 80% in two districts for D3 at 18 months, five districts for P3 at 18 months and six districts for measles at 24 months.

J M White BSc
S Leon
Immunisation Division
PHLS Communicable Disease Surveillance Centre

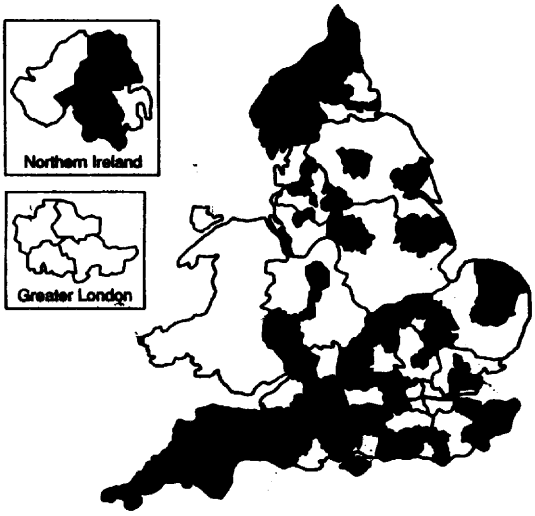
Figure 1 Districts that have achieved 95% vaccine coverage by May 1992

a) Diphtheria (D3) at 18 months

b) Pertussis (P3) at 18 months



c) Measles at 24 months



* The regional breakdown of these data is available on request