AIDS: WORLDWIDE POLICIES AND PROBLEMS

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To collect data from other countries.

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1 INTRODUCTION

The condition which was later to be called AIDS emerged in the early 1980s in several widely separated locations, including the United States, Haiti, Belgium, France, Zaire and Zambia. The first medical reports, relating to a cluster of cases among homosexual men in the United States, appeared in 1981. Less than 10 years later, the cumulative total of cases reported to the World Health Organisation had reached 334,216 by March 1991. Very few countries of the world have not been touched by the epidemic. It was estimated in 1989 that at least 5 million people in all five continents were infected by the human immunodeficiency virus (HIV), the causative agent of the auto-immune deficiency syndrome (AIDS): 2.4 million in Africa, 2 million in the Americas, 500,000 in Europe and 100,000 in Asia and Oceania[1]. In February 1991, WHO increased the estimate of total infections to 8-10 million. By the end of 1990, it was thought that perhaps half a million new-born infants in Africa had been infected[2], and by 1992 it is predicted that AIDS will be among the five leading causes of infant and childhood mortality in the United States[3]. Considering the numbers already infected, WHO predicts that by the year 2000 there will be a cumulative prevalence of 30 million cases of AIDS, with 10 million of these in children.

The scientific response to the epidemic has been energetic. Since the syndrome was initially described in 1981, the causative virus has been identified, increasingly efficient tests for its presence have been developed, and much has been learnt about its pathogenic mechanisms. Since the virus is integrated into genetic material and therefore replicates itself, it is very difficult to intervene in terms of vaccines or therapies. However, many candidate vaccines are under trial and there are several drugs which appear to delay the disease or help to treat its various manifestations.

The scientific agenda is not the only one that is relevant, however: the epidemic has created new crises of public health throughout the world. Because of its particular and unique combination of characteristics, the virus presents special problems for prevention and control, as well, of course, as treatment and care. This is a truly international problem, one which has spread because of travel and movements of populations, and is being tackled by international agencies of many kinds.

International cooperation in mapping the epidemic, in research, and in aid to the countries unable to bear the burden, has not been matched, however, in collaborative learning about the problems of control. AIDS has many faces: in some countries it has been seen as a social problem amenable to moral change; in others as a problem of the control of deviant groups; in others as a problem threatening from 'elsewhere' requiring border controls; in others as a threat to economic development; in others as a classical medical issue to be dealt with by public health measures. The public health issues may in fact be different in each country, in large part because the patterns of the epidemic vary. There are, however, many common issues, about which considerable lack of consensus remains, and countries have seemed reluctant to learn from each other's experience.

The objective of this monograph is to describe these policies of prevention and control worldwide, in the hope that some general lessons may emerge.

2 THE NATURE OF HIV

If the policy response to AIDS depends on epidemiological patterns, these patterns in turn depend on the particular nature of the human immunodeficiency virus. A necessarily brief summary of current knowledge follows, focussing especially on those features of the disease which affect its transmission patterns or create particularly problematic issues for medical and political policy.

In 1981 the Centers for Disease Control in the United States noted an unusual cluster of cases secondary to pneumocystis pneumonia and Karposi's sarcoma among homosexual men. These early cases had in common that they occurred among men with a large number of sexual contacts, many with each other. Cases followed among IV drug users, and it became evident that this was not, as it was first dubbed, essentially a 'gay disease', but a widespread infection by an agent transmitted in a manner similar to Hepatitis B, by blood or sexual contact. This infectious agent was isolated in 1983. It is now known that it was in existence in many other parts of the world. Very early cases have been identified, some from preserved blood or tissue samples, in New York in 1959, in Zaire in 1959, in Norway in the early 1960s and in a former seaman who died in the UK in 1959 who is believed to have been infected in the 1940s[1].

The clinical course of HIV/AIDS

Following infection with the virus, the individual may experience an acute but transient febrile seroconversion illness, with sore throat, lymphadenopathy and rash, but the person then generally remains virtually asymptomatic for several years.

The virus most commonly met with is known as HIV-1. A related virus, HIV-2, has been found in a number of African countries, and appears to be most widespread in W Africa. Cases have also been reported in the United States, Canada, Brazil, Japan, and several countries of Europe. There is some indication that the incubation period may be longer than for HIV-1, but the infection leads to a similar clinical picture.

The effect of HIV, as its name implies, is to deplete the immune system, which makes the patient susceptible to unusual cancers and so-called opportunistic infections which normal immunity would protect against. A variety of clinical expressions may occur before the diagnosis of the most severe consequence of the infection, the syndrome of AIDS. Once AIDS has developed, there is little evidence to indicate that it will not invariably be fatal.

There has been a major effort to develop potential therapies, but for many reasons this is a considerable challenge. There are many drugs of value against the major opportunistic infections, but the primary search is for drugs which will have a direct antiviral effect on the causative agent, or enhance or reconstitute the function of the immune system. Zidovudine, a compound that interferes with virus replication, was first shown to prolong life in 1988[2]. This drug is the only one licensed in the US for the treatment of AIDS, and is widely used throughout the world. Problems of side effects have emerged, however, and a number of other antiviral compounds and other drugs, both alone or in combination with zidovudine (notably dideoxyinosine, ddI) are under trial and show some hope of achieving greater benefit with reduced toxicity.

Thus therapies have prolonged life, in those countries where their cost is not prohibitive. A 'cure' is not available, however, and WHO has estimated that 50 per cent of infected persons will develop AIDS by 10 years and 75 per cent by 15 years. The average length of the incubation period is still unclear, because of the relatively short period that has been available to follow the course of the disease, and also because in many cases there is uncertainty about the date when infection occurred. In the longest-observed cohorts of homosexual men in the United States, the estimated mean time between infection and progression to AIDS is commonly about 9 years[3,4,5]. A recent study has suggested that 15.5 per cent of infected persons might be expected to develop AIDS within 4 years, and 36.2 per cent within 7 years[6].

The inability of those with AIDS to withstand infections means that survival times, once diagnosis is made, are relatively short. In the US three-quarters of those diagnosed in 1987 and earlier have died. An analysis of all cases reported in the UK before September 1987 showed a median survival time of 10 months[7]. There is evidence, however, that cases diagnosed in more recent years are surviving longer: in the US an average time of almost two years has been reported[8], and in Australia 76 per cent of more recently diagnosed cases have survived over a year[9]. In one London hospital the median survival time of patients with AIDS doubled from 10 months in 1984-6 to 20 months in 1987-9[10]. This longer survival reflects earlier diagnosis and reporting, or it may indicate some success of treatment in prolonging life.

The short period between infection and the development of antibodies which can be detected ('seroconversion'), and the long period of asymptomatic infection which may intervene before any illness develops, are obviously crucial problems for surveillance and control. Unless specifically tested, there is no way of knowing who is infected. Moreover, the prolonged incubation period means that known AIDS cases represent infection which occurred years before.

Serological tests, first used to protect the supply of blood for transfusion, have been commercially available in many countries since 1985. Initial tests were designed to detect antibodies to HIV. Much effort has gone into developing new tests, improving sensitivity, and providing simple procedures that can be used in less well-developed health systems. Tests based on the measuring of antibodies present in saliva were developed in 1987 and although they are not recommended as a diagnostic tool they are available for epidemiological studies. In the US, 'home testing kits' have been developed, and were authorised for general use in 1990, though they are not widely acceptable for use outside medical settings because of the lack of associated counselling.

The problem of the 'window' between infection and seroconversion remains: it appears that the time

between exposure and the development of antibodies is very variable. Most people have seroconverted within 1-8 weeks, but various studies have shown a small proportion remaining antibody-negative for between 6 and 42 months before seroconversion[11].

Transmission of HIV

There are only three common methods by which HIV infection is transmitted:

- From exposure to blood (or blood products) as a result of the transfusion of infected blood or the use of needles and syringes contaminated with infected blood (including the sharing of needles and syringes by drug abusers).
- Through sexual intercourse, from an infected person to his or her sexual partner, through exposure to blood, semen, or vaginal and cervical secretions.
- From an infected mother to her foetus or infant, before, during, or shortly after birth.

The virus has been isolated from a wide range of body fluids including saliva, tears, and breast milk, raising wide public fears about its 'infectiousness'. In fact, despite its virulence, the virus is difficult to transmit, and survives poorly outside the body. It is not transmitted through the respiratory or enteric routes or by casual person-to-person contact, nor is there any evidence of transmission by food, water, or insects.

Transmission by blood

The question of the safety of blood and blood products was first raised in 1982. Before the availability of a test for HIV, the response could only be the recommendation to those who might be at risk to exclude themselves voluntarily from blood donorship. Early cases of infection occurred in many countries among those receiving transfusions, and among haemophiliacs. In the United States an estimated 12,000 transfusion recipients were infected. Blood screening began in 1985, and together with other preventive policies such as care in donor recruitment reduced the risk of infection by blood donation to almost nil in most industrialised nations. Infection may still take place where medical services are under-resourced or medical practices dangerous, however: as late as 1989 and 1990 the spread of HIV, especially among children, was being reported in Eastern European countries because of the use of unsterile needles. In developing countries, though the institution of blood screening has high priority, it may still be incomplete or absent, and syringes may frequently be reused in medical settings. Transfusions may be made in emergencies with no stored blood available, so that paid or family donors have to be used. Children are the most commonly transfused group.

Blood transfusion is certainly the most 'efficient' method of transmission – perhaps approaching 100 per cent if the donor of the blood was in a late stage of disease[12]. The exact episode of infection is, of course, more easily pinpointed in transfusion cases than in others, and studies have found rather shorter incubation periods than for other modes of infection: a mean 5.3 years in France[13], or, in the US, three-quarters of the patients developing AIDS by 5.2 years, with shorter periods for children and for older patients[14].

Transmission by the sharing of contaminated equipment among intravenous drug users is the mode of transmission which appears to be accelerating in the US and many countries of Europe. The spread of the virus through nonsterile needles and syringes is facilitated by the efficiency of blood to blood transmission. As with transmission by transfusion (and, indeed, sexual transmission) it appears that infectivity certainly increases as the stages of illness progress[15].

There is some small risk to health service personnel through needlestick injuries. Throughout the world, 19 health care workers are known to have contracted HIV infection through their work, with a further 16 presumed cases. The risk is low: it is estimated at 0.31 per cent of exposures to needlestick injury, considerably lower than the risk associated with a similar exposure to hepatitis B virus. No infections due to mucosal contact or skin contamination have been reported[16].

Sexual transmission

In contrast to blood-to-blood transmission, infection by sexual intercourse is relatively 'inefficient'. There are many issues still unresolved about variation in the likelihood of infection, but one estimate is that on average less than 1 in 200 contacts between infected and non-infected people will result in its being transmitted. On the other hand, there are many definite cases of people becoming infected after a single sexual encounter. In general, important variables are the number of sexual partners an individual has, the type and number of sexual acts, and the disease stage of an infected partner. All forms of intercourse carry a risk of transmission, but the highest risk appears to occur among men and women who engage in receptive anal intercourse with an infected partner. Among homosexual men, transmission was found in one study to be 3.5 times as likely to those who practised receptive anal intercourse, than to those who practised insertive anal intercourse[17]. Trauma to the mucous membrane of the rectum may facilitate transmission. For heterosexual men and women, vaginal intercourse probably carries greater risk than oral intercourse. Studies of couples have shown that females practising anal intercourse with infected males are at considerably greater risk than males with an infected female partner. In penile-vaginal intercourse, females also appear to be at greater risk: it has been estimated that 15-30 per cent of females become infected, but only 5-15 per cent of males[18], and in one study of a large number of partners one of whom was HIV-positive, there was a 3.5 times greater risk to the female partners over a period of 6 months[19]. Transmission from female to male may be more likely during menstruation.

Perinatal transmission

Thirdly, HIV may be transmitted from a mother to her infant, before, during, or shortly after birth. The virus has been isolated from the foetus, the placenta, and from amniotic fluid. In those countries with primarily heterosexual spread, the tragedy of the infant epidemic cannot be overstated: in Africa, it has been suggested that the gains being made in general child survival are increasingly likely to be reversed in regions where HIV is being transmitted in a substantial proportion of births[20]. In developed countries, as rates of infection increase among women (especially among IV drug users), perinatal HIV infection causes increasing concern.

Studies of perinatal transmission are complicated by the fact that there are problems of diagnosis in infants, especially in those countries where infant mortality is already high. Since maternal antibodies are transferred to infants, tests cannot show whether the infant is infected until 15-18 months, when the maternal antibodies are no longer present.

Transmission rates from infected mothers have ranged from 20-40 per cent in a variety of studies, with some similarity between Africa and Europe[21]. A major European Collaborative study found a lower transmission rate of 12.9 per cent, however[22]. In two hospitals in Zaire, 21 per cent of the infants of seropositive women died in their first year and 8 per cent of those who survived developed AIDS (the mortality rate among infants of mothers without infection was 4 per cent)[23]. More premature births, and a greater incidence of low birth weight, have also been reported among seropositive mothers. There is little evidence about the maternal factors that influence transmission, though they may be higher among mothers who have symptoms[24]. They may also be higher among IV drug users.

The virus was detected in breast milk at an early date[25,26] and there have been a few reported cases of transmission through breast-feeding. In industrialised countries, seropositive mothers are advised not to breast-feed, an additional reason being that many are using narcotic drugs which are also transmissible in this way. In the developing world, however, WHO has advised that breast-feeding should continue regardless of infectivity, since any major change to bottle-feeding would result in many more deaths than were saved[27,28]. Rare cases of transmission from an independently-infected child to a breast-feeding mother have been reported from the USSR.

Associated diseases and cofactors

There is clear evidence that the presence of another sexually transmitted disease may increase the risk of HIV transmission. Genital ulcers, which occur with syphilis, chancroid, or herpes virus infection, act as a portal of entry to the virus. Thus there must be concern about eg prostitutes, in those countries where prostitutes are known to have high rates of STDs. In the United States there is concern because syphilis is rising sharply, with a 34 per cent increase between 1981 and 1989. This rise is almost entirely among the black population, and is thought to be associated with poverty, homelessness, and the crack cocaine epidemic[29,30].

A relationship has also been established between HIV infection and tuberculosis. The incidence of TB had been declining in industrial countries for many years, but during the 1980s concern arose about rising prevalence: for instance, in New York new cases rose by 36 per cent between 1984 and 1986. Worldwide, dual infection with HIV and TB is common: the WHO has estimated that over 2 million people are dually infected in Africa. If immunity is compromised by HIV infection, then existing TB may be reactivated.

There is also worry about possible interactions between HIV and certain tropical diseases, though there is as yet no clear evidence except for leprosy. It seems that the progression of HIV disease is accelerated in patients with both HIV and leprosy[31]. This may also be true of malaria, though here the association may be indirect and lie in the blood transfusions used to treat the anaemia often associated with malaria[32].

Conclusion

Several of the characteristics of HIV and AIDS which have been described have special relevance for the problems of policy and control. These include:

- the apparently invariable lethality of the full-blown disease syndrome, and the public fear that this arouses;
- the invisibility of infection, and the impossibility of knowing whether it exists, without tests which may or may not be available, and may or may not be sought;
- its status as, largely, a sexually-transmitted disease, with all that this implies for the need to alter private behaviour;
- the uncertainty that exists about the probability that transmission will occur in any given circumstances, which means that clear and simple public education messages are not easy;
- the 'window' period between infection and the production of antibodies, so that early infection may not be revealed by testing;
- the variability in the way in which the disease may develop, which affects not only the ease of clinical diagnosis and the accuracy of reporting, but also the clarity of the public's understanding;
- vertical transmission from mother to child, which adds weight to concern about infection in women, and presents severe dilemmas to HIV-positive women who desire to have children;
- the length, as well as the variability, of the latency period, which places a great burden on those who know they carry the virus, and which also means that knowledge about AIDS represents only the past, in terms of prevention policies.

It will probably never be possible to map precisely the way in which the epidemic has spread throughout the world. The evidence of the early cases, and the regular 'discovery' of HIV infection in areas where none was thought to exist, suggest that HIV must have existed, at low rates, in many different areas for many years. The flashpoints causing explosion of disease have occurred in particular circumstances in different places, wherever infection reached a 'critical mass' and social circumstances or behavioural patterns provided the environment for its spread. While the first explosion may have been within a particular group – homosexual men in one place, IV drug users in another, heterosexual men and women with certain patterns of sexual behaviour in another – the virus is no respecter of 'risk groups'. No group is socially impermeable, and the patterns of the epidemic are continuously changing.

Figure 1 shows the number of officially reported cases of AIDS, year by year, in the different regions of the world. These trends appear to demonstrate an earlier beginning, and a less steep rise in latter years, in N America and Europe than in the African continent. It is, of course, very possible that this is at least in part an effect of better and quicker ascertainment. On the other hand, there are parts of the world – Asia and the Far and Middle East (not included in the diagram) where numbers of reported AIDS cases are as yet very low, and a genuine difference in timing is apparent.

Figure 1 **Numbers of AIDS cases reported to WHO each year, by continent.**

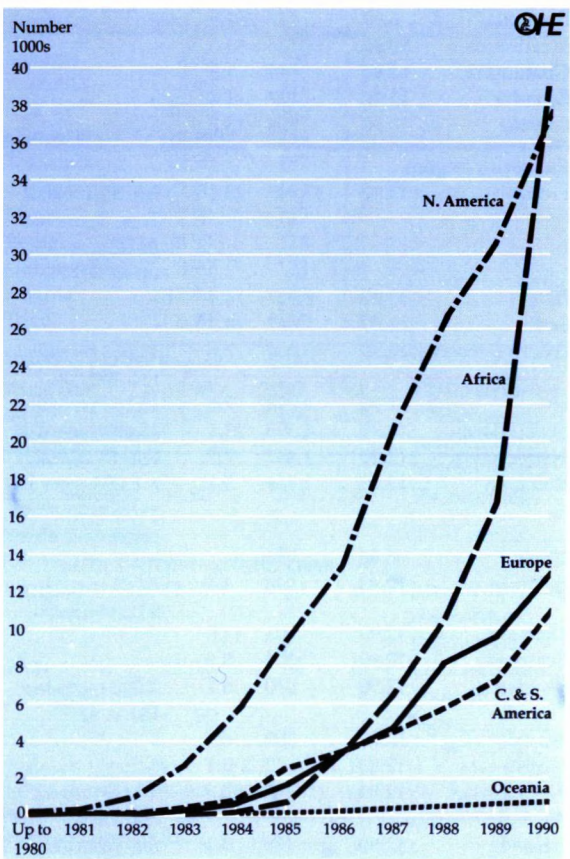


Table 1 **Reported and estimated AIDS cases, and estimated cases of HIV infection (adults) worldwide, end 1990.**

	Reported AIDS cases	*Estimated true figure of AIDS cases*	*Estimated cases of HIV infection*
N America	156,658	200,000	1,000,000
S America	28,937	90,000	1,000,000
Africa	77,043	650,000	5,500,000
Europe	41,564	50,000	500,000
Asia	843	2,000	500,000
Oceania	2,334	2,700	30,000

Table 1 gives the cases of AIDS reported to WHO, cumulatively, for the areas of the world at the end of 1990, together with the estimated true figure and the estimated HIV infection. Table 2 lists the latest available figures for all the individual countries in the world where at least 100 AIDS cases are reported, with estimated or reported prevalences of HIV infection where they are available. The United States still accounts for 47 per cent of the over 300,000 known AIDS cases. It can be noted, however, that the countries with the highest rates are Bermuda, Bahamas, French Guiana, Uganda and Congo, and many other countries, especially in sub-Saharan Africa, are showing much greater proportional rises from year to year than the US or Europe. In one year, 1989, AIDS cases in Africa more than doubled, compared with a 56 per cent rise in Europe and a 43 per cent rise in the Americas.

Interpretation of statistics

It has to be recognised that the figures used in the table cannot be entirely accurate. There is a variety of technical and political reasons why 'official' statistics of AIDS cases and deaths may be under-estimates. At the end of 1990, WHO suggested that, worldwide, less than one third of cumulative AIDS cases have been reported (Table 1). This has policy relevance: the decision to attempt as full a recording as possible is a policy decision, and in some cases lack of reporting has equally been a deliberate policy. Further, the 'trends' demonstrated, whether real or artefactual, then reflect back to influence the choice of control measures.

In the early years of the epidemic AIDS statistics were, in many places, a politically sensitive issue. In developing countries the limited access of parts of the population to health-care, and the lack of facilities for diagnosis, may still mean that reporting is delayed or incomplete. In Zimbabwe, for instance, it was not permitted to enter AIDS on death certificates until late 1989, and the recording system which has existed since does not include children. In Zaire, there are virtually no statistics of AIDS outside the capital. The Congo did not report to WHO between 1987 and 1990. In the Ivory Coast, the official number of cases at the end of 1989, 250, was less than the number reported in one hospital study[1]. Against a background of high general mortality, and particularly in difficult economic and political circumstances, the precise compi-

lation of statistics may not have high priority. In other countries, particular clusters of infection may have remained 'hidden' until their discovery causes a sudden jump in statistics, as the examples of Romania or the USSR demonstrate.

Even in those countries with the best-developed public health systems, not all AIDS-related mortality is identified. Its definition, on clinical criteria, is not necessarily always clear-cut. In 1987, the US Centers for Disease Control revised the national case definition, with a marked impact on both the number of cases reported and their distribution, including a rise in the proportion who were female, black or hispanic, or drug misusers. Moreover, doctors may, perhaps out of consideration for patients and their families, not always choose to record deaths as AIDS-related. Even when so certified, deaths may not be reported to the relevant surveillance body, and in many countries the reporting of cases (before death) relies on a 'voluntary' system. In the UK, for instance, cases of AIDS have been reported to the central surveillance agency since 1982, on a voluntary and confidential basis. It is believed that most clinicians cooperate, but checks by the British Communicable Disease Surveillance Centre in a health district in London suggested that 19 per cent of the AIDS-related deaths 1986-7 had not been so notified[2], and in 1990 local surveys in the UK still revealed considerable under-reporting. In Canada, comparison in 1989 of death certificates with cases reported revealed 25 per cent under-reporting[3]. In the US, an analysis of hospital records in S Carolina 1986-7 found that only 59 per cent of the AIDS-related cases were reported, with poorer reporting among blacks[4], and postmortem records of a cohort of intravenous drug users in New York City suggested that the possible AIDS mortality could be increased by 134 per cent between 1981 and 1986 among drug users[5]. On the other hand, it has been suggested that in the US the prevalence of AIDS in white higher socio-economic status groups is underestimated relative to prevalence in minorities[6].

If the registration of AIDS cases presents some difficulties, even in Western countries, the question of the prevalence of HIV infection is even more difficult. None of the reported figures in Table 2 represents more than a fraction of the true total, or a guess at the true total. Only those who have been tested, and whose test results have been recorded, can be included. In many countries (e.g. Denmark), those who are found to be HIV-positive are not registered, on the grounds that any form of registration might discourage those who know they are at risk from coming forward for test. In other countries, including the UK, reporting of the results of HIV tests is voluntary, and it is known that there is wide under-reporting. Everywhere, the possibility of multiple tests on the same individual (if results are reported wholly anonymously), and the lack of necessary coincidence between area of testing and area of residence, complicate the interpretation of HIV statistics. In developing countries, testing equipment is provided for research by Western research grants, and to a limited extent by international agencies, but its cost precludes any systematic screening in most countries. Combined with this are the problems of movement of populations.

Table 2 **AIDS and HIV throughout the world, as reported at 1 January 1990*. (All countries with 100+ cases of AIDS.)**

Country	*Date of report (month, year)*	*Cumulative AIDS cases*	*Case rate per 100,000 population*	*No of cases of HIV infection, if known*
American Region				
USA	12.90	161,073	72.6	Est. 1-1.5 million
Brazil	12.90	16,015	11.8	Est. 400,000.
Mexico	12.90	5,907	7.5	Unknown. True number of AIDS cases est. 11,500.
Canada	9.90	4,427	18.8	Est. 30-50,000
Haiti	12.90	3,086	47.5	–
Dominican Republic	12.90	1,485	23.1	–
Honduras	12.90	1,098	25.1	–
Columbia	12.90	1,285	4.8	–
Venezuela	12.90	1,061	6.1	Est. 20-60,000
Trinidad and Tobago	12.90	736	62.1	Est. 34,000
Argentina	6.90	710	2.3	Est. 35,000
Bahamas	12.90	599	277.0	–
Peru	12.90	356	1.8	–
El Salvador	12.90	223	5.9	–
Chile	12.90	255	2.1	400 recorded
French Guiana	9.90	232	269.8	–
Costa Rica	12.90	232	8.2	–
Panama	9.90	220	9.9	–
Guadaloupe	4.90	195	58.4	–
Jamaica	9.90	183	7.8	–
Barbados	12.90	172	68.0	–
Uruguay	1.91	164	5.4	627 recorded. Est. 14-15,000.
Bermuda	6.90	147	262.5	–
Martinique	10.90	166	55.3	–
Guatamala	12.90	142	1.8	–
Ecuador	12.90	127	1.4	–
Guyana	10.90	108	13.7	–
European Region				
France	12.90	13,145	23.4	Est. 85-199,000. True figure of AIDS cases est. up to 17,700.
Italy	12.90	8,227	14.4	–
Spain	12.90	7,487	19.3	–
(West) Germany	12.90	5,500	7.6	39,663 recorded. Est. 100,000.
UK	12.90	4,098	7.6	15,166 recorded
Switzerland	12.90	1,593	23.1	13,637 recorded
Netherlands	12.90	1,487	7.7	Est. 10-20,000
Romania	12.90	1,168	5.1	c. 8,000 recorded, predominently children.
USSR	6.90	986	–	–
Belgium	12.90	824	8.4	5,754 recorded. Est. 10-25,000.
Denmark	12.90	705	14.0	–
Portugal	12.90	522	5.7	–
Sweden	12.90	510	6.1	2,210 recorded. Est. c. 4,000
Austria	12.90	502	6.6	–
Greece	12.90	412	4.1	–
Norway	12.90	185	4.8	900 recorded, est. 2,200
Ireland	12.90	179	5.1	948 recorded

European Region continued				
Yugoslavia	12.90	174	0.8	2,032 recorded, est. 5,000.
Israel	12.90	141	3.2	–
Africa				
Uganda	7.90	17,422	106.2	Unknown: suggested 1.3 million.
Zaire	1.90	11,732	33.3	Unknown but high.
Kenya	5.90	9,139	44.9	Unknown but est. over 200,000.
Tanzania	2.91	8,163	37.6	Unknown but est. 500,000.
Malawi	1.90	7,160	87.5	Unknown but high.
Ivory Coast	3.91	6,836	68.0	Unknown but high.
Zimbabwe	9.90	5,249	58.3	Unknown but est. 500,000.
Zambia	12.90	4,036	60.5	Unknown but high.
Rwanda	7.90	3,407	56.1	Unknown but high.
Burundi	9.90	3,305	70.1	–
Congo	12.89	1,940	111.5	–
Ghana	8.90	1,732	12.7	–
Burkino Faso	6.90	978	11.1	Unknown but high.
South Africa	2.91	680	2.0	Est. 317,000 (black), 1,000 (white).
Central African Republic	12.89	662	25.4	–
Ethiopia	12.90	636	1.5	Unknown but high.
Mali	7.90	338	4.1	–
Senegal	3.90	307	4.7	–
Namibia	6.90	311	26.3	–
Sudan	10.90	265	1.2	–
Cameroon	12.90	243	2.2	–
Mozambique	12.90	162	1.2	–
Guinea	7.90	161	2.7	–
Niger	7.90	149	2.4	–
Benin	8.90	124	2.8	–
Guinea-Bissau	3.90	123	13.8	–
Angola	12.88	104	1.2	–
Togo	6.90	100	3.3	–
Western Pacific Region				
Australia	12.90	2,347	13.7	12,923 recorded.
Japan	3.91	374	0.3	118 recorded, predominently haemophiliacs.
New Zealand	12.90	229	7.0	596 recorded.
South East Asia				
No country yet reported >100 cases.				
Thailand	12.90	80	0	More than 25,000 recorded. Est. 202,000.
India	12.90	60	0	4,082 recorded. Thought to be high.

*Figures reported to WHO, unless there is a later official national statement for the country concerned. Rates cannot be given for HIV infection, since the true prevalence is not known in any country.

Patterns of the epidemic

The extent of the epidemic is not, however, the only factor which determines a country's policies. Overall figures conceal the fact that this is not one epidemic, but several: its particular characteristics will inevitably influence the way in which it is perceived.

Since the classification was suggested in 1986, it has been customary to divide the countries of the world into Pattern I, II and III countries, though five years later patterns have become more complex:

Pattern I. The 'original' Pattern I, still displayed by some countries, where 80 per cent or more of cases are in homosexual men.

Pattern Ia. The development of Pattern I experienced by most countries. The rate of infection among homosexual men appears to be levelling off, though deaths from AIDS cannot be expected to fall for some years. The steepest rise in infections has been taken over by intravenous drug users, who may now account for 25 per cent or more of AIDS cases, and among whom rates of HIV infection suggest that the toll of AIDS will be very high. Continuing spread into the heterosexual population, and growing numbers of babies infected at birth, are to be feared in such countries, where the male/female ratio is obviously declining.

Pattern Ib. Countries in which notable rises in the rates of HIV infection appear to have begun among the drug-using population, who may already account for 50 per cent or more of AIDS cases and constitute majorities of those known to be HIV-positive. In these countries, male/female ratios will be low.

Pattern Ic. Countries in which the original infection appears to have occurred among homosexual or bisexual men, but in which the spread to the heterosexual population, and to women, has been direct and very rapid. These countries are sometimes designated as Pattern I/II.

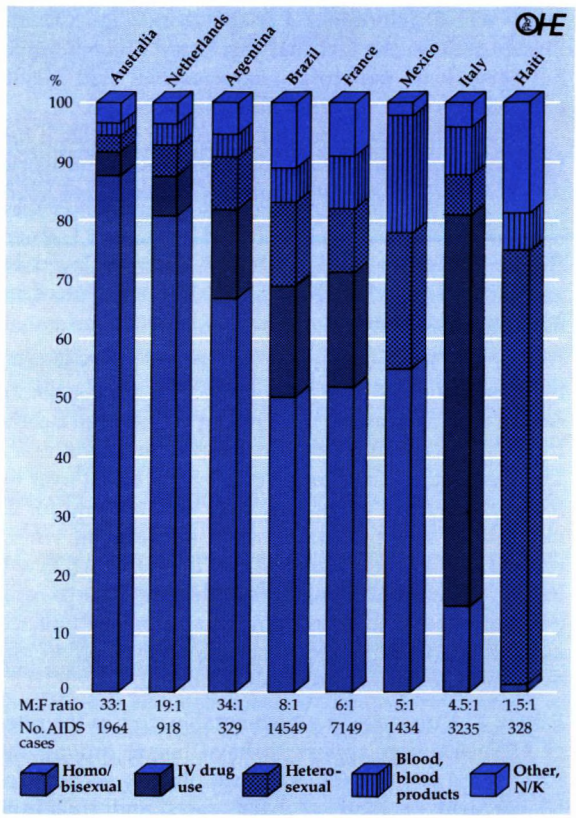
Pattern II. Countries in which transmission has been almost entirely heterosexual, with high rates of infection among migrants, refugees and prostitutes. In these countries males and females are equally affected, and there is particular concern for the very high prevalences of infection among pregnant women and among children.

Pattern III. Originally applied to countries with few AIDS cases. In many the rate of HIV infection among large groups of the population – usually drug users and prostitutes – is now known to be explosively high. In some of these countries cases of AIDS are escalating.

Pattern I – The homosexual epidemic

Immediately after its first recognition as a disease entity among homosexual men in the United States in 1981, AIDS was initially thought to be limited to this group. It soon became evident that the infection was not confined to one risk group – or, indeed, to one particular country. Because of the initial explosive spread of infection among homosexual men, especially in West Coast cities, the majority of reported cases of

Figure 2 **Transmission categories for cumulative AIDS cases, different countries compared.**



Note: 'IV drug use' includes IV drug use by male homo/ bisexual; 'other' includes paediatric cases and mode of transmission unknown. The figures used are those for end 1989 in some cases, and end 1990 in others: total number of AIDS cases may therefore not be the same as in Table 2.

AIDS in the United States, cumulatively, are still among homosexual men: the same is true of Canada, and of northern European countries. In all of these countries, however, there has been a slowing of the rate among homosexual men. In the United States, this has been most apparent in cities such as San Francisco, Los Angeles and New York, and the decline is thought to be due to some degree of behavioural change in this community (combined, perhaps, with the treatments which are now possible to delay disease).

In a few countries, the pattern of predominently homosexual transmission persists (Figure 2). Studies among homosexual groups in Brazil, Mexico, Argentina and Colombia have found that 20-40 per cent are HIV-positive[7,8,9]. This is a lower prevalence than found in the US, but this may simply indicate a later introduction[10]. Brazil has one of the highest numbers of reported AIDS cases in the world, though the population rate is not high. Here, the greatest concentration of cases is in the south-eastern region of the country, which includes the cities of Rio de Janeiro and Saõ Paulo; sexual transmission accounts for 73 per cent of cases and of these 91 per cent are homosexual or bisexual men. Australia is another Pattern I country. The first case was identified in 1983 in Sydney, the centre of homosexual groups. Since then, the rise in the number of cases has been less steep than in many countries, and the epidemic is still predominently among homosexual men, with low rates among IV drug users or ascribed to heterosexual transmission. National surveillance for HIV infection was implemented in Australia only in 1989 and reporting is not complete. The available figures for transmission categories suggest, however, that there is still little infection in the heterosexual or IV drug user categories.

Some of the countries of Europe also still demonstrate a primarily homosexual pattern. In (West) Germany, for instance, 71 per cent of AIDS cases are ascribed to homosexual transmission, and only 3 per cent to heterosexual. In the Netherlands, 81 per cent are categorised as homosexual. In these countries, as in the United States, however, there are signs of change.

The developing epidemic

In the United States the predominent image of AIDS of the 1980s, of middle-class white homosexual men, is changing: although the homosexual category of transmission still predominates in cases of AIDS, the evidence of steeply climbing rates of both AIDS and HIV infection suggests a new image, of underpriviledged members of the black and latin communities infected by IV drug use or heterosexual transmission (Figure 3). In 1989 AIDS was identified among black drug users at a rate twelve times as high as among white. In 1990 IV drug users accounted for about 40 per cent of all new cases[11]. Although the male:female ratio of AIDS cases is still high at 8.5:1 (1990), an increasing proportion of cases is occurring among the female sex partners of IV drug users, and among their children. This represents, of course, infection which must have taken place some years ago. In 1989 the prevalence of HIV in childbearing women was estimated to be 140/100,000[12] and AIDS was predicted to become the 5th leading cause of deaths in women in 1991. Paediatric AIDS is increasing, especially in New York City, where 1.25 per cent of the newborn were positive for HIV in 1988[13]. These babies are disproportionately black and hispanic. There is also concern about rising rates among young people, especially women: in 1989-90 there were equal numbers of AIDS cases among males and females aged 17 and 18, whereas previously there had been many more males. In 'sentinel' testing in New Jersey and New York hospitals, up to 3.8 per cent of 15-19 year olds were found to be HIV-positive and up to 22 per cent of men aged 23-44[14]. In a sample of 16-21 year olds living on the streets in New York City, 6.7 per cent were found to be infected.

The epidemic is thus developing into one which will primarily affect the young, the poor, and black/ hispanic communities. At the same time, it is spreading more generally throughout the United States. In 1990 86 per cent of cumulative AIDS cases were reported from large metropolitan areas, but towards the end of the year particular increases were announced in rural areas, especially Georgia, Arkansas, Mississippi and rural Texas. Diagnosed AIDS increased during that year by 37 per cent in these areas, but by only 5 per cent in metropolitan areas.

Similar patterns of sharp rises in cases among IV drug users, with still low but accelerating prevalences among women and children, are being demonstrated in other Pattern I countries (Figure 2). In Europe as a whole, the proportion of AIDS cases attributed to drug use was only 2 per cent in 1983, by 1985 had risen to 15 per cent, by 1988 had reached 34 per cent and by 1991 almost 50 per cent. Much of this is due to the drug-associated epidemics in some Southern European countries, but even in the Northern countries where transmission is still primarily homosexual, the proportion of AIDS cases among drug users is increasing; in [West] Germany, for instance, from 5 per cent in 1983 to 13.2 per cent in 1990. Moreover, in those places where cases of HIV infection are recorded, the probability of even steeper rises in AIDS among drug users, among women, and among men and women infected heterosexually, is clear. 'Sentinel' screening among IV drug users in Quebec, Canada, for instance, produced a rate of 4.2 per cent of HIV infection in 1988, and a dramatic rise to 19 per cent in 1989. The UK is not a country which is, as yet, experiencing an explosive increase in reported cases of AIDS among drug users or among women. Nor is it a country where individual HIV testing has been actively encouraged, so that known cases of seropositivity are likely to be severely underestimated. Nevertheless, the time trends for AIDS cases according to transmission categories, Figure 4, with the recorded HIV infection which shadows them, demonstrates very clearly the changing epidemic.

Explosive drug user epidemics

In a belt of Southern Europe covering Spain, S France and Italy, and in some countries of Eastern Europe, although homosexually-transmitted infection does exist, the 'flash-point' would seem to have occurred among drug users. This is also true of some of the hardest-hit individual cities in other countries, such as New York and Edinburgh. Once HIV has entered a previously uninfected IV drug using population, it

Figure 3 **Transmission categories for cumulative AIDS cases (end 1990), United States, males.**

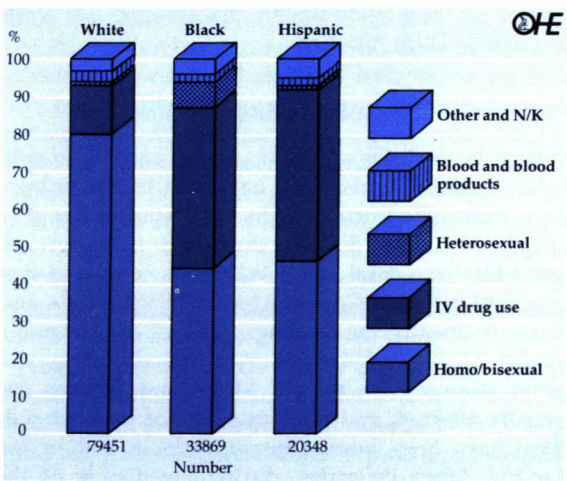
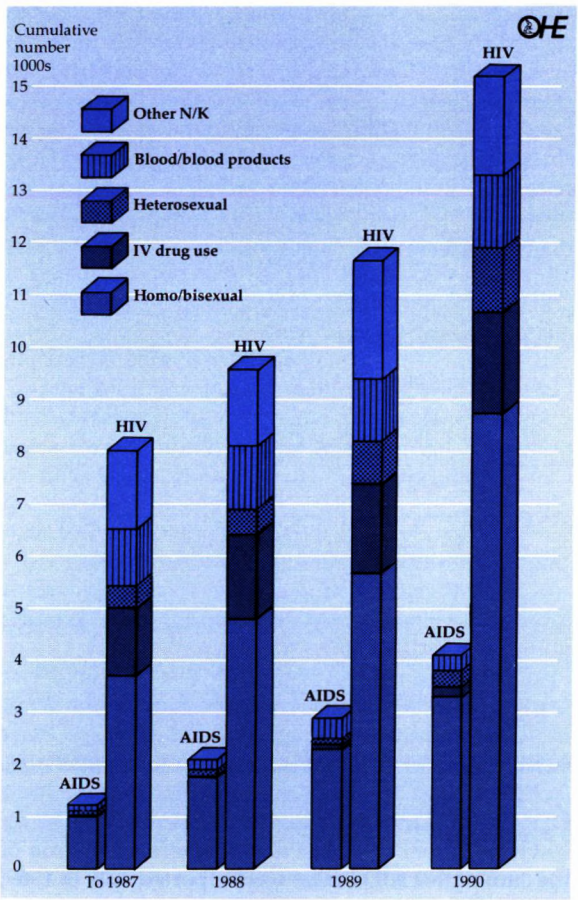


Figure 4 **Transmission categories and cumulative numbers of cases reported, AIDS and HIV infection, United Kingdom.**



appears that it can spread with frightening rapidity. For instance, studies of drug users in Bari, Italy, in 1982 revealed a 5 per cent prevalence of HIV, rising by 1985 to 76 per cent[15]. Similarly, HIV was first detected among drug users in the city of Edinburgh, UK, in 1983, and by 1985 a prevalence of 51 per cent was recorded[16]. In New York, new cases of AIDS among IV drug users and their partners began to outnumber those among homosexual men for the first time in 1988. It is estimated that 10-20 per cent of the entire population of men aged 25-44 is HIV-positive, and 5-8 per cent of all women, with a total of perhaps 150-200,000 cases in the city. Positivity among drug users is thought to be as high as 50 per cent[17] There is a high risk not only among heroin users, but also users of 'crack' cocaine who may be injectors or indulge in unsafe sexual behaviour. If drug users are vigorously policed and imprisoned, HIV infection becomes a major problem in prisons: in New York City 20-25 per cent of all new inmates have been found to be infected.

In some of the countries of S Europe IV drug use is the predominent means of transmission. In Spain (1989) 66 per cent of all AIDS cases were among drug users, and three-quarters of the female AIDS cases. In Italy, the appearance of HIV coincided with an increasingly severe drug problem which was believed to be facilitated by the passing of a law in 1975 legalis-

ing possession of drugs for personal use, and by meagre treatment facilities[18]. The number of cases of AIDS attributable to drug use overtook the number among homosexuals as early as the end of 1985, and in 1989 80 per cent of cumulative cases were attributed to drug use, if heterosexual contact with users, and the children of drug users, were included[19]. Very high rates of HIV infection have been found among hospitalised drug users or clinic attenders, e.g. up to 71 per cent in Italy, and 54 per cent in Spain. In these countries, as in New York, rates of infection may be high in prisons. In Catalonia, Spain, for instance, among over 600 inmates prevalence of HIV infection was 63.2 per cent among regular IV drug users, and 5.9 per cent among non-drug-users[20].

In these countries there has been a rapid increase in heterosexually-transmitted cases of AIDS. A high prevalence of infection among drug users appears to lead quite quickly to second-generation heterosexual transmission, that is, infection among those with no direct overlap with high risk groups. In Europe, as in the US, it also leads to increasing prevalence in disadvantaged groups or areas: in Italy, for instance, to a spread to the south, where incomes, unemployment rates, and welfare services are inferior to those in the north.

In Eastern Europe, it appears that the epidemic started some four or five years later than in the West. In some countries – Hungary, Czeckoslovakia, East Germany – the spread was among homosexual men. In others, however, the majority of those known to be HIV-positive are drug users – in Yugoslavia, for instance, 72 per cent. In Poland, where two-thirds of the cumulative AIDS cases were reported only in 1989, 70 per cent are drug users, tending to belong to poorer social groups.

Bisexuality as a bridge

The first patient with AIDS in the Caribbean region was diagnosed retrospectively in Haiti in 1979[21]. Between 1983 and 1986, there was an exponential rise in the number of cases in the region, with a doubling time of only 6 months. Initially, as in Latin America, the cases were among homosexual/bisexual men: in 1984 all known cases came into this category. However, by 1987 the greater proportion of cases were heterosexual, with male:female ratios greatly diminishing.

The bridge to the heterosexual population in these countries appears to be bisexuality, rather than drug abuse. Religious and cultural taboos may prohibit open homosexuality, so that the declared homosexual transmission is artificially low. In other countries of Latin America, the categories of 'homosexual' or 'bisexual' have little clear-cut meaning: in Brazil, for instance, stigma is reported to attach to passive partners in same-sex activity, but active partners would not regard themselves as homosexual[22]. In a number of countries, including Brazil, Mexico, Haiti, bisexual men represent at least as large a proportion of AIDS cases as homosexual. Seroprevalence among them is high. In two cities and two rural towns of Brazil (1989), 28 per cent of samples of bisexual men and 23 per cent of those who were exclusively homosexual were HIV-positive[23].

Transmission into the heterosexual population appears to be particularly rapid under these circumstances, with the consequent infection of women and their children. In the 19 countries of the Caribbean, there were no AIDS cases among women by 1984. In 1989 32 per cent of cases were female. In Haiti, 9.6 per cent of pregnant women have been found to be infected[24], and AIDS among infants is a substantial problem in Jamaica, Haiti, the Bahamas, and Trinidad and Tobago. Over 40 per cent of prostitutes have been found to be HIV-positive in Port au Prince, Haiti[25]. In part because of cultural patterns of sexual behaviour, infection has spread quickly from the primary groups, extending after about 1987 from the women partners of bisexuals to men infected by women and infecting others in turn[26].

In Pattern I countries such as those of N America and Europe, bisexuality has been little studied and may be more important, as a bridge by which infection reaches the heterosexual population, than has been recognised[27]. Surveys have suggested that bisexual behaviour is in fact quite common. A consistent finding in the UK is that 5 per cent of homosexual men have current female partners, and non-clinic based community studies indicate that the majority of homosexually active men have had female partners at some point in their lives[28,29,30]. Within the previous year, commonly 10-12 per cent have had female partners. Clinic-based studies give higher rates, with up to 30 per cent of homosexually-active men classed as bisexual. Similarly, in Norway 2.9 per cent of a large random population sample of men admitted to partners of both sexes[31], and in Australia, 4.2 per cent of currently married men and 6.4 per cent of previously married men had had a male partner in the previous year[32]. It has been suggested that in these Pattern I countries the shift to safer behaviour that has taken place between homosexual men has not occurred in relation to female partners, and few tell their female partners of their bisexuality[33]. Thus, though seroprevalence among bisexual men is commonly shown to be less, in these countries, than among the exclusively homosexual[29], the potential for spread to women and their children is undoubtedly real, though less obvious than in Latin America.

Pattern II: The heterosexual epidemic

Pattern II countries are those, almost entirely in sub-Saharan Africa, where HIV has, from its beginnings, been transmitted primarily by heterosexual sex. It is largely an urban disease, though it may now be spreading into rural areas. WHO has estimated that one in 40 people in Central Africa is HIV-positive, and AIDS is already the leading cause of death among young adults in Kinshasa, Kampala, Entebbe, and other cities of the region. Males and females are equally affected, and large numbers of infected children have been born. One estimate is that in ten Central Africa countries, during the decade of the

1990s, there will be an additional 2.1 million deaths of children under 5, and 4.3 million orphans, who will comprise 8.5 per cent of the total population of children under 15[34].

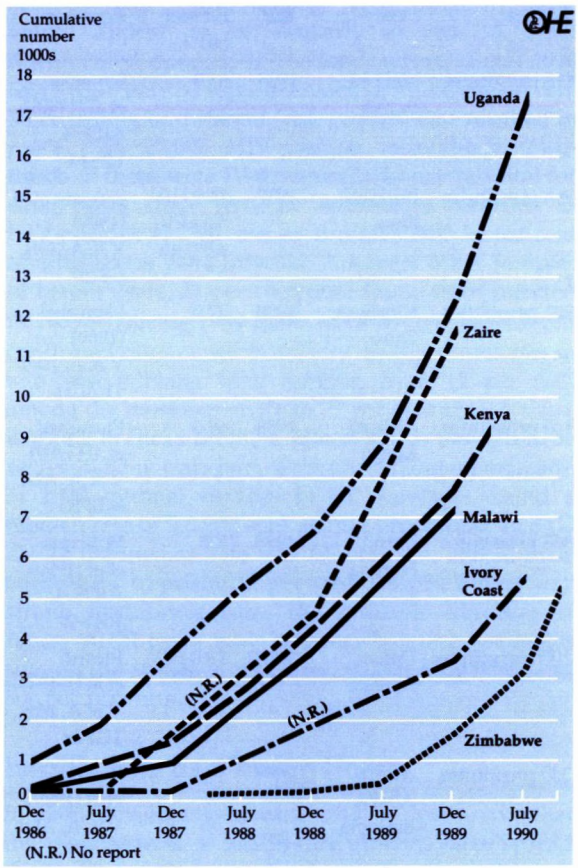
Many factors have contributed to the spread of infection, notably the emergence of centres of production which have required labour to be drafted from rural areas, with crowded accommodation among a predominently male migrant workforce. Thus traditional lifestyles have been disrupted[35]. Predictive models suggest that the epidemic is capable of reducing rates of population growth and altering the age structure of these societies, though not until two or three decades after HIV has begun to spread[36]. Effects on the labour supply and agricultural productivity are feared.

In countries which already have high infant mortality rates, and which lack the resources for diagnostic equipment and testing, the pattern of spread of the disease – and even its true extent – are difficult to map. It appears, however, that the epidemic started in the late 1970s and early 1980s. The discovery in Europe in 1982/3 of AIDS patients who had come from Africa led to research in, for instance, Zaire and Rwanda, which identified clusters of cases. At the same time, an epidemic of what was known as 'slim disease' appears to have started in Uganda. Given movements of workers and refugees, the disruption caused by conflicts, the difficulty of altering cultural patterns of sexual behaviour, and commonly a lack of safe blood for transfusion or sterile equipment for medical injections, the spread of the disease to countries previously unaffected has seemed inevitable. AIDS was not, for instance, thought to be a problem in W Africa, and the first case in the Ivory Coast was reported only in 1985. By the end of 1988 AIDS had become the major cause of illhealth and death among adults in the city of Abidjan. One third of the AIDS patients in the city's two hospitals came from 21 other countries outside the Ivory Coast[37]. In Namibia, the prevalence of HIV infection is thought to be trebling each year, with spread from returning refugees from Angola and Zambia. In Angola, though prevalence is low, it is highest in the north, among the army and refugees from war zones, and is spreading to other regions[38].

Lack of information means that the course of the epidemic cannot be presented in the same way as for the US or Europe. Figure 5 shows only the way in which recorded cases of AIDS have increased in a selection of African countries. It is obvious that the differing trends over time confuse geographical differences with ascertainment and reporting practices. Uganda, for instance, has had decisive monitoring policies from an early date. Zaire, though one of the first countries to be investigated, did not update its reports between June 1987 and May 1989, and reported cases in the Ivory Coast suddenly trebled in the first three months of 1990.

The prevalence of HIV can be ascertained in these countries only from special studies, which are likely to be of women giving birth and at antenatal clinics, hospitalised patients, blood donors, prostitutes or prisoners. Extremely high rates have been found: some

Figure 5 **Cumulative number of AIDS cases reported, six African countries.**



examples are listed in Table 3.

More general community studies have been made and have shown widely varying but often high rates of infection: 12.5 per cent in rural areas and 21.5 per cent in trading areas in a national survey (1988) in Uganda; 4 per cent in randomly selected households in Bangui, Central African Republic; 6.4 per cent among the general population of Abidjan, Ivory Coast (1989). In a population study in one region of Tanzania (1987) 9.6 per cent of adults were HIV-positive (24.0 per cent in the urban zone) and 1.3 per cent of children under 14. In rural areas, male and female prevalences were equal, but in urban areas, female rates were higher than male[39] In Uganda, population-based studies in rural, semi-rural and urban communities (1987) found that the rate of infection among women ranged between 1.12 and 1.80 times that of men, though the ratio for reported AIDS cases was approximately equal[40]. In 1988, a nationwide study in urban and rural populations in Rwanda found rates of 17.8 per cent (urban) and 1.3 per cent (rural), again with higher rates among females than males in urban areas[41]. In Kinshasa, Zaire, over 7,000 factory workers and their spouses were tested (1988), producing a prevalence rate of infection of 2.4 per cent[42].

The demographic and social consequences of the epidemic in Pattern II countries, with the disproportionate loss of young people at the most productive period of their lives, may be severe.

Table 3 **Examples of seroprevalence studies in African countries.**

Subjects	*Place*	*Year*	*Per cent HIV+*	*Reference*
418 prostitutes	Nairobi, Kenya	1985	62.0	Simonse et al (1990) AIDS 4, 139-44
268 prostitutes	Burkino Faso	1987	14.9 HIV_1 5.6 HIV_2 4.8 both	Sangare et al (1989) V ICA, Abs. G026*
801 prostitutes	Kinshasa, Zaire	1988	37.0	Laga et al (1989) V ICA, Abs. ThA021
145 prostitutes	Nairobi, Kenya	1988	69.0	Plummer et al (1989) V ICA, Abs. MBP53
353 prostitutes	Borno, Nigeria	1988	5.1	Williams et al (1990) AIDS. 4. 1041-2
1000 prostitutes	Dakar, Senegal	1989	10.0 HIV_2	Ricard et al (1989) V ICA, Abs. TGP29
330 prostitutes	Addis Ababa, Ethiopia	1989	18.2	Zewdie et al (1989) V ICA, Abs. MAP79
543 STD clinic patients	Butari, Rwanda	1986-8	79.0	Harelimana et al (1989) V ICA, Abs. MBP188
156 STD clinic patients	Abidjan, Ivory Coast	1987	9.0	Odehouri et al (1989) AIDS 3, 509-12
238 female STD patients	Nairobi, Kenya	1988	12.6	Plummer et al (1989) (op cit)
500 STD clinic patients	Addis Ababa, Ethiopia	1989	12.0	Keferrie et al (1989) V ICA, Abs. UGP26
412 STD clinic patients	Zimbabwe	1990	51.0	Ministry of Health (1990)
Blood donors in 31 hospitals	Zambia	1988	11.0 in urban areas	Luo et al (1989) V ICA, Abs. MBP149
547 blood donors	Malawi	1988	19.6	Kool et al (1989) *Trop. Geog. Med.* 42, 128-32
3813 blood donors	Bangui, Central African Rep.	1988	12.2	Georges et al (1989) IV ICAA, Abs. 007*
1025 blood donors	Kinshasa, Zaire	1988	4.8	Jäger et al (1990) AIDS 4, 571-4
First-time blood donors	Zimbabwe	1990	7.0 15.0 in adult donors	Ministry of Health
7800 admissions to hospital	Malawi	1986-8	4.5 HIV-related diseases	Kool et al (1989) (op cit)
882 inpatients, 446 outpatients, 15 hospitals	Uganda	1987	37.0 inpatients 53.0 out-patients	Berkley et al (1989) J. *Infect. Dis.* 160, 22-30
200 hospital patients	Abidjan, Ivory Coast	1987	45.0	Odehouri et al (1989) AIDS 3, 509-12
1715 admissions to 2 hospitals	Abidjan, Ivory Coast	1988	25.0 HIV_1 4.0 HIV_2 11.0 both	De Cock et al (1990) AIDS 4, 443-8
251 admissions to one hospital	Kinshasa, Zaire	1988	F: 57.6 M: 43.7	Hassig et al (1990) AIDS 4, 883-7
1268 outpatients	Cameroon	1989	10.8	Ghipponi et al (1989) IV ICAA, Abs. 035
1727 hospital patients	Abidjan, Ivory Coast	1989	21.7 HIV_1 1.5 HIV_2	Porter et al (1989) V ICA, Abs. TBP116
410 hospital patients	Bissau	1989	17.6 HIV_2	Naucler et al (1989) IV ICAA, Abs. 053
925 pregnant women	Burundi	1986	16.3	Standaert et al (1988) *Trans. Roy. Soc. Trop. Med. & Hyg.* 82, 902-4
Attenders at antenatal clinic	Kampala, Uganda	1987	24.1	Carswell & Lloyd (1987) AIDS 1, 192-3
508 antenatal attenders	Kinshasa, Zaire	1988	3.8	Kashala et al)1989) V ICA, Abs. WGO30
1485 pregnant women	Rural area, Zaire	1988	2.9	Hardy et al (1989) V ICA, Abs. MGP18
200 pregnant women	Bissau	1989	17.6 HIV_2	Andreassen et al)1989)
1st antenatal visit 2 hospitals 247 and 214	Malawi	1990	18.6 and 16.4	V ICA, Abs. MGP16 Miotti et al (1990) AIDS 4, 733-6

3891 pregnant women	Malawi	1990	23.1	Miotti et al (1990) V ICAA, Abs. TOD3*
2400 pregnant women	Nairobi, Kenya	1990	7.1	Temmerman et al (1990) V ICAA, Abs. WOC5
405 child patients	Lusaka, Zambia	1988	23.2	Malek et al (1989) V ICA WGO5
1217 child patients	Kinshasa, Zaire	1988	5.0	Shaffer et al (1990) *AIDS*, 1231-6
2127 newborns	Bangui, Central African Rep.	1989	7.0	Somse et al (1989) V ICA, Abs. WGO28

* V ICA: Vth International Conference on AIDS, Montreal.
IV ICAA: IVth International Conference on AIDS and Associated Cancers in Africa, Marseilles.
V ICAA: Vth International Conference on AIDS in Africa, Kinshasa.

Pattern III: Ticking bombs

In many of the large populations of South and East Asia, the number of reported AIDS cases is very low. Until relatively recently, these countries appeared to have been isolated by their geography. Yet many of them have 'dangerous' characteristics: inadequate medical systems, a lack of diagnostic facilities, large drug-using populations, and in some cases many foreign visitors. Limited seroprevalence studies during the last two or three years suggest that it is in these countries that a new and explosive epidemic may be imminent. In most cases, the first infection has been through foreign contact, but subsequent spread has been rapid. National anxieties are reflected in the restrictive policies of many countries in the region.

In India, for instance, less than 100 AIDS cases have been reported. The first individuals identified as HIV infected were six women engaged in prostitution in 1986. By late 1990, more than 5,000 HIV-positive individuals had been reported, though this is thought to be a severe underestimate. Most have been found among blood donors and have been due to heterosexual transmission; few are by homosexual transmission, and the first indigenous cases among IV drug users were found in the NE state of Manipur bordering the 'golden triangle' of opium growing areas. Screening of samples of drug users in 1990 showed that more than half were HIV-positive. It has been estimated that one in three pregnant women in Bombay may be infected, and very high rates of up to 40 per cent among tested prostitutes have been reported. The existence of an estimated several hundred thousands of IV drug users, and the lack of screening of blood outside cities, are additional dangers. The WHO warned in 1990 that by 1995 perhaps 60,000 cases of AIDS would need hospitalisation, even if no new infection occurred.

Countries such as Malaysia, with an estimated 400,000 drug addicts, or the Philippines, with high seropositivity found among 'hospitality workers', would appear to be similarly at risk. A well-documented example is Thailand, where at end 1990 there were only 80 reported cases of AIDS, but surveillance testing of different 'risk groups' had resulted in more than 25,000 HIV-positive individuals. Two-thirds of these were IV drug users. In one hospital for drug users, there were no admissions recorded as HIV-positive in 1987, but by summer 1988 30 per cent of admissions were infected. Amongst other samples of heroin users, 21 per cent were found to be infected in 1989[43]. During 1989 there were widely quoted and confirmed rates of seropositivity among prostitutes in one area (Chiang Mai) ranging from 12 per cent among the most expensive to 75 per cent among those working in cheap brothels. Infection was thought to be widespread in transport centres and fishing ports, and in 1990 sentinel surveys in all provinces found a median rate of 9.6 per cent among prostitutes. In STD clinics the median rate was 2.5 per cent, and in male admissions to prison 12 per cent. Despite a relatively strong health-care base, the probable numbers of future AIDS cases may be overwhelming: estimates suggest the existence of at least 200,000 drug users and 500,000 prostitutes.

Health-care as a Trojan Horse

In many developing countries, it is of course true that the inadequacies of health-care systems have spread the epidemic to unknown degrees, through unscreened blood or the unavailability of sterile needles. There are also several developed countries where – as yet – AIDS prevalence is very low, but the majority of the cases of seropositivity have been caused by medical procedures. In earlier years, these may have been confined to the supply of transfusion blood or blood products for haemophiliacs, before screened and treated products became available. Japan is such a country, where 63 per cent of AIDS cases, and 85 per cent of known HIV infection, is among the recipients of blood and blood products. Among perhaps 5,000 haemophiliacs, 30-60 per cent are thought to be HIV-positive. Strict drug control laws mean that drug use tends to be concealed, which perhaps accounts for limited needle-sharing and an absence of drug-related HIV transmission. Similarly, considerable stigma applying to homosexuality may mean a pattern of fewer partners. Such a profile obviously affects the way in which AIDS policy develops.

In other countries, notably in Eastern Europe, AIDS was long claimed to be absent among indigenous populations. In Romania, for instance, there was only a handful of cases reported by the end of 1989. By February 1990, 706 HIV-positive children had been found, infected in orphanages and paediatric hospitals. By July 1990, over 8,000 HIV-positive children, and 617 cases of AIDS, were known in children under 4 years. The causes of this tragic situation were believed to be the lack of health-care resources, the absence (until then) of blood screening, the practice of pre-

scribing 'microtransfusions' of blood for children, especially the malnourished, and the official programme of demographic expansion, including the criminalisation of abortion and contraception, which resulted in large numbers of children for whom care had to be provided. In less dramatic fashion, similar 'discoveries' of paediatric AIDS have been made in the USSR, where (May 1990) 57 per cent of cases consisted of children infected by medical procedures.

The foreign disease

There remain several countries where the majority of a small number of cases is reported as due to intercourse with foreigners abroad. It is not yet clear whether China will remain such a country. AIDS was first reported in the SW border region among drug users, but by mid 1990 a scattering of cases had been found in other provinces.

In some countries, notably in the Middle East, it is thought that the prevalence of infection, though undoubtedly low, is underestimated. Saudi Arabia, the United Arab Emirates, Iraq and Bahrain, for instance, do not supply any information to WHO. A tendency to concealment may be fostered by tradition and culture, where AIDS is seen as associated with homosexuality, which is culturally unacceptable. Islamic fundamentalism stresses AIDS as a punishment for sin, and in many societies sex outside marriage, homosexuality and prostitution are unacceptable or illegal. Moreover, there may be little access to HIV testing. Thus knowledge about prevalence is limited. There are in fact few countries without a primary infection through early use of contaminated blood and blood products, though blood screening is comprehensive in most Middle Eastern countries.

Predictions

For policy formulation, all nations require reliable statistics, both for current AIDS cases and for the future burden represented by HIV infection. This summary of the spread of the epidemic – which, it must be emphasised, is no more than five or six years old in visible form – must show clearly that prediction presents many problems. Incomplete reporting of AIDS and reporting delays, the impossibility of knowing how many people are infected with HIV, changes in the groups affected, the difficulty of ascertaining or predicting how sexual behaviour may change, the effects of possible advances in treatment – all these mean that forecasts have to change as knowledge increases, and at best are informed guesses. In fact, successive revisions of WHO's estimates, now based on sophisticated methods and an extensive data bank[44], have proved to be accurate. Official forecasts in the US have also proved reasonably correct: in 1986, for instance, from a baseline of 19,000 cases of AIDS at that time, the Coolfont Report predicted 155,000-219,000 cumulative cases at the beginning of 1991[45].The number is in fact within this range.

In other individual countries with "later" epidemics prediction has proved difficult. Widely differing forecasts have been made, with unfortunate consequences for both policy and the public perception of the epidemic. If numbers are revised downwards, there may be accusations of previous scaremongering, and a reluctance to take any statistics seriously. Britain, though by no means the only country to which this applies, provides an example. Initially, there were forecasts of an alarmist nature: for instance, 3 million infected with HIV by 1991, rising to 12 million by 1994[46]. In 1986, extrapolating from early trends, 3,000 new cases of AIDS were predicted for 1988[47], though in fact only 755 were reported. The early doubling of cases each year led to predictions of 12,000 new cases in 1990[48], when in the event the actual figure was approximately only one-tenth. In 1988, the government-commissioned Cox Report[49], basing its estimates on the numbers of people thought to be infected with HIV in 1987, predicted (while emphasising the unreliability of the available data) a range of 10,000-30,000 cases of AIDS by 1992. The cumulative number of deaths by the end of the century might reach 100,000[50]. In 1990 it became obvious that these were over-estimates, and early in 1991 the figures were revised to a possible 30,000 deaths[51]. The proportion of these among women is expected to rise eventually to 40 per cent. As information about existing HIV infection accumulates, predictions will become more accurate. It is emphasised, however, that they are still extremely speculative, and in Britain as elsewhere dependent on the changing patterns of the epidemic.

4 ECONOMIC COSTS

It would be naive to pretend that perception of the actual or predicted economic costs of the epidemic will not affect national policies. These are, however, difficult to estimate. Uncertainty about the future course of the disease, changes in therapy or in the duration of treatment required, changes in policy concerning the location or type of care – all these make prediction a matter of guesswork. The economic evaluation of the effectiveness of care programmes is equally difficult[1]. Even the analysis of current costs is problematic, since the question of what to include – costs of testing? of education and training? of informal and community care? in less developed countries, of concommitant diseases such as TB? – means that economic studies provide widely differing figures. There are many predictions, and a number of retrospective analyses, but it is probably generally true that countries find themselves unable to isolate the true current cost of AIDS to any useful extent.

In developed countries the medical costs, though not small, are still relatively so in relation to total health budgets. One estimate in the US in 1988, for the predicted 270,000 AIDS cases 1981-91, was US$22 billion, with an estimated US$80,000 lifetime treatment costs for every individual: approximately 1.5 per cent of national health care expenditure[2]. Another estimate of direct medical costs was 0.2 per cent of personal health expenditure in 1985, rising to 1.4 per cent in 1991. Indirect costs, including the economic costs of years of productive life lost (high, of course, for a disease affecting mainly younger people) were estimated to be 1.2 per cent of the total indirect costs of all illness in 1985, rising to 12 per cent in 1991[3]. In France, in 1990, medical costs totalled some FFr2,200 million, about 1.2 per cent of total hospital budgets, and were expected to rise to FFr2,700 million in 1991[4].

Retrospective analyses have shown higher costs than predicted. In the US, mean costs per person per year in ten studies ranged (in 1986 US$) from $29,100 to $75,200. In Europe, on the other hand, costs were lower: six studies showed a range, in similar 1986 US$, from $18,800 to $46,800 per person per year[5]. In France, the inpatient costs were estimated at $26,300 per patient/year, and in Munich, [West] Germany, with outpatient costs included, $22,916[6]. In the UK, the figure was £31,186[7]. Studies are difficult to compare, however, since even if only health system costs are being considered, some are confined to hospital care, while others include outpatient care. The stage of the disease at which the patient is entered into economic studies is also relevant: this may be only when hospitalised, or at the point of diagnosis of AIDS, or at the point of being found to be HIV-positive.

In Britain, an early governmental project to assess costs used two approaches: patient costing using medical records, and district costing, aiming to extract HIV/AIDS costs from total costs within health districts. An example of the latter estimated total HIV/AIDS expenditure in one district, Oxfordshire, in 1988/9 at £1.6 million, or 1.2 per cent of total district spending. The areas of counselling, testing, etc., were allocated 15.5 per cent of the expenditure and 14.1 per cent went to teaching and research. Costs per patient/year for each AIDS patient were £17,000, but it was noted that current costs from diagnosis to death are likely to be at least 1.5 times as great, since patients were more likely, at an earlier date, to enter the system at a later stage of the disease[8].

Total costs of care – that is, including informal, voluntary and social care as well as medical care – are of course much greater. In a study of people with HIV/AIDS in four English and one Scottish localities the costs of formal and informal social care ranged between £88-105/week for each person with AIDS, and £17-19 for each HIV-positive individual. The aggregate cost for such care, nationally, was estimated to be £20-30 million annually. The cost to local authorities of supplying services (excluding health services) ranged, in the year 1989-90, between £665,000-1,165,000 in the five study areas, with allocations to voluntary agencies ranging, in different districts, between £63,000 and £803,000[9].

In all societies the burden on the public purse will, of course, depend on the ratio of financial responsibility between government and private insurance or other health provision. Even though these costs may be only a small proportion of total health budgets, they will obviously have serious resource implications in countries with publicly-funded services, probably already under pressure. In countries where public services are provided only for the indigent, problems arise because of difficulties in obtaining private insurance and because of the rising prevalence among drug users, who typically have more complications and less ability to pay or find sources of care. In western countries, AIDS cases have tended to be concentrated in large centres, and the impact of costs may fall unequally on city budgets. In the US, for instance, problems have been created by the inadequate patchwork of health insurance coverage and the consequent burden on Medicaid, already held to be underfunded[10]. In 1991 it was claimed that the public hospital system was being overwhelmed, in New York and other cities, by the increasing number of low income or uninsured AIDS patients, and requests were made for an annual US$2,000 million in federal funds to prevent the collapse of the system.

In developing countries the economic implications are, of course, infinitely more menacing. Costs have to be seen within an environment of mounting national debt, and the economic implications of the epidemic must include the loss of young adults on which economies depend, especially for farming labour. In Zaire, deaths by 1990 have been estimated as accounting for a loss of 8 per cent (US$350 million) of GNP. In many HIV-affected nations hospital services account for 60-70 per cent of health budgets, and there are many reports (Table 3) that half or more of caseloads may be associated with HIV. It would seem that AIDS patients are displacing others who might have been admitted: in Zaire, for instance, dramatic increases in mortality for non-AIDS hospitalised patients suggests that they are being admitted only at a more serious stage of illness. In 1989, it was estimated that in Africa government per capita spending on health varied between US$1 and 10 per year, and the cost of caring for 10 people with

AIDS in the US was greater than the entire budget of a large Central African hospital[11]. In 1988, the direct cost of health care for each person with AIDS in Tanzania and Zaire ranged from US$100 to US$1,500[12]. In some countries, the cost of one HIV test is more than the annual per capita budget. In Zaire, the cost of only one episode of hospitalisation for AIDS is estimated to be more than three times average monthly income[13]. Obviously, in these countries economic considerations prevent the possibility of treatment with expensive drugs, and severely restrict treatment options.

These different patterns of the epidemic, levels of prevalence, and potential costs, together with different cultural and political backgrounds, may be expected to affect the response which nations have made. No attempt is made here to list the control policies of all the countries of the world: such lists detailing, for instance, entrance requirements world-wide have been published by WHO[1]. In the discussion of control policies there is inevitably some emphasis on more developed countries. The less developed, though they may have wide ranges of non-governmental organisations engaged in preventive and educational work, are less likely to have the complex legal and administrative structures available for formal control policies. This is not to suggest that energetic measures have not been taken. Uganda, for instance, has been notable in Africa not only for a commitment to openness but also for strong policies: in 1990, the raising of the age of consent from 14 to 18, the proscribing of prostitution and homosexuality, and the redefinition of the crime of incest to include the extended family. In less developed countries generally, however, policies are less easy to ascertain and list.

Surveillance and control may of course be applied at various levels. The widest level is the international. The extent to which a country participates in WHO programmes may be part of national policy. WHO dates the beginning of its 'global mobilisation' against AIDS from a meeting held after the first International Conference on AIDS in Atlanta, US, in 1985. During late 1985 and 1986 the Global Programme on AIDS was drafted, with the objective of unifying international efforts and assisting the national programmes of less well-resourced countries. This was subsequently adopted by the World Health Assembly (Geneva, 1987), the Venice Summit of Heads of State (1987), the United Nations General Assembly (Geneva, 1987) and the World Summit of Ministers of Health (London, 1988). Guidelines have been produced for the development of national AIDS prevention and control programmes, especially for less-developed nations: a 'Short-term Plan' of 6-12 months, reviewing the known prevalence of HIV infection, identification of the groups at risk, and initial public information and education; and a 'Medium-term Plan' of 3-5 years, with the implementation of blood screening, the encouragement of specific behaviour change, and the coordination of AIDS control with primary health care strategies. Most nations have completed their short-term plans and have medium-term plans in progress.

At national levels, most countries have National AIDS Committees or other overseeing or policy bodies. The position is more complicated in those nations with federal structures, where even though policy is made by national governments, state governments may choose different approaches. In particular, states may favour stronger measures, as has happened in eg the US and (West) Germany. For instance, in Australia, though there has been clear guidance from the National Strategy, with an emphasis on the provision of care and education, the prevention of discrimination, decriminalisation of prostitution and

homosexuality, and education and methadone maintenance programmes for drug users in prisons, the States have implemented these guidelines in the light of their own epidemiology and political situations. New South Wales, for instance, has been at the forefront of educational and care programmes for homosexual men, and services with and for prostitutes or drug users. In Queensland, on the other hand, homosexuality remains illegal and segregation is applied in prisons.

In every country, non-governmental organisations and self-help groups have had notable parts to play in practical policy, whether in Western or developing countries. National policies may differ, of course, in the extent to which non-governmental organisations are explicitly involved in the policy process. In the US, for instance, a traditional belief in the efficacy of the non-governmental sector has meant that voluntary organisations have been looked to for the provision of both education and service provision. In countries without universal health or social services, voluntary and charitable organisations may obviously have a particularly important role. Even where national health services exist, policies may differ in the extent to which these organisations are seen as a substitute for central funding.

Surveillance, screening and testing

The identification of cases of AIDS, and HIV infection to the extent that it is possible, is of course the first instrument in any nation's control policy. Many countries or states quickly added AIDS to their existing lists of infectious or venereal diseases requiring compulsory notification, so that previous laws apply (for instance, Iceland, Mexico, Sweden, Poland). In the UK the provisions of the Public Health (Control of Disease) Act were extended to cover AIDS in 1984, but it was not made a notifiable disease: reporting remains on a voluntary basis, as it does in eg Belgium or the Netherlands. In others, AIDS has not been designated as a communicable or sexually-transmitted disease: in France, for instance, it has been suggested that this is because of sensitivity to extreme laws passed by the Vichy regime in relation to STDs during World War II. The reporting of AIDS is mandatory in 24 of the countries of Europe, and voluntary in seven. In the US reporting of AIDS cases to health department registries has been mandatory in every state since 1983.

Fewer administrations require named HIV-positive individuals to be reported, though testing laboratories may be expected to report positive cases anonymously. In Finland, named reporting is required, except by specially appointed 'confidential' physicians. In Canada, reporting is mandatory in eight provinces. In the US 33 states require reporting, in 21 cases named, with confidentiality protection. Among those states which do not require reporting, notification may still be required in certain circumstances, such as some criminal cases. In Japan, an AIDS Act of 1989 enforces anonymous (or in certain circumstances named) reporting by strong sanctions. An example of a country where any mandatory reporting is rejected, however, is (West) Germany, with its strong culture in modern times favouring an absolute right to privacy, and extreme sensitivity about the possibility of data abuse. Similarly, confidentiality and non-coertion are emphasised in Denmark, where there is no reporting of HIV. These differing approaches obviously have implications for comparative knowledge about the extent of infection in different countries.

Legal sanctions

Those exceptional cases seen as posing a special threat are likely, of course, to attract special sanctions everywhere. Knowingly or deliberately spreading infection may be construed as assault, manslaughter, or murder, under existing criminal law. Alternatively, sanctions may already be available for those seen as 'recalcitrant' or dangerous under ordinary public health legislation. A number of prosecutions has been brought in the US against the HIV-positive for spitting, biting, spattering blood, having sexual intercourse or donating blood. However, since criminal intent is difficult to prove, several states have enacted specific statutes, creating a criminal offence of having sexual intercourse without informing the partner of known infection. Notably severe penalties are available in eg S Carolina and Louisana. Similarly, the 'wilful' transmission of HIV has been made a criminal offence in eg New South Wales and Victoria, Australia, in Luxembourg, Czechoslovakia and Bulgaria, and by the Prevention of AIDS legislation of 1991 in the USSR: in some of these countries, the penalties are severe. In the USSR hospital staff are criminally responsible if 'hygienic' rules are broken.

The extreme sanction is the possibility of quarantine. Public health regulations may already allow for isolation or enforced 'treatment' for sexually transmitted or infectious disease, and HIV/AIDS can be included among these. In other cases, eg in Sweden and some states of the US, the isolation of persons who 'pose a threat to public health' because of HIV/AIDS can be expressly authorised. The only countries which have legislated for the possibility of quarantine of all those infected with HIV are China, N Korea and the USSR, and the only country in which segregation is known to have been practised on any scale is Cuba. There is no evidence anywhere that policies of isolation can be successful in controlling the spread of infection.

Entry controls

Many countries have instituted regulations preventing the entry of certain foreigners infected with HIV. Particularly where infection is seen as threatening from 'outside', this is a way in which governments can appear to be acting strongly, and protecting their populations. The controls are, however, commonly arbitrary and illogically applied.

In some cases the requirement is that an HIV test should be taken on or after arrival. In others, certificates must be produced on arrival. In many countries potential immigrants known to be HIV-positive or to be suffering from AIDS could be excluded, of course,

by the application of existing health regulations, and these may be brought into play in 'suspicious' cases without the necessity for specific regulations.

The most usual targets for regulations are foreign students, applicants for work permits, and potential immigrants. Countries requiring HIV tests or certificates for foreign entrants who intend to stay for varied periods include Pakistan (longer than 1 year), USSR (3 months), China (1 year), Egypt (1 month), Philippines (6 months), Saudi Arabia (1 month). South Africa has required testing for migrant workers from Malawi. India requires test certificates for those staying for over one year, but makes certain exclusions such as those working in foreign missions or journalists. Other countries specify certain classes of visitor who must be tested: in the Philippines, for instance, foreign seamen, US service personnel, and members of international agencies and their families. Many countries insist on HIV-negative certificates for foreign residents or applicants for residence, and in several there are reports of foreigners who prove HIV-positive being deported (eg China, USSR, Somalia, Goa). Other countries (eg Iceland, Finland, Norway) offer voluntary testing to immigrants. In the US, an amendment in 1987 to the Immigration and Nationality Act added HIV to the list of 'dangerous' contagious diseases, thus making it a bar to immigrant status or to a visitor's visa. Temporary visitors could acquire a waiver under certain conditions (visits to family, on business, or for medical treatment), but a distinguishing code was originally stamped on the passport. In 1990, a more confidential form of recording was introduced following wide condemnation of these practices at the time of the VIth International Conference on AIDS.

While the desire of countries to protect themselves from accepting immigrants who bring the possibility of high medical costs is understandable, the particular features of HIV render many of these measures problematic as far as protection from infection is concerned. Many of the countries which screen foreign students or long-stay foreigners exclude such groups as business travellers, airline personnel, or diplomats from the regulations. No country except Iraq insists on tests for short-stay visitors, because of the loss of tourist or business income. Only a few (USSR, Cuba, Bulgaria, Iraq, Syria, reportedly in Korea) test their own citizens returning from abroad. In any case, of course, the possession of an HIV-negative certificate at the time of entry is not in fact a guarantee of freedom from infection.

Ascertainment of HIV infection

The extent to which HIV testing is used as an instrument of control and surveillance varies greatly. Testing can be mandatory (applied to particular groups, or, rarely, to whole populations), encouraged voluntarily, not encouraged, or simply unavailable. The results can be compulsorily notified, voluntarily notified, or not centrally recorded at all. In Europe, the reporting of HIV is mandatory in 17 countries, voluntary in 6, and not reported in 8. Screening, or the examination of entire populations or groups within populations, is usually distinguished from testing, the determination of infection in an individual.

Screening for donations of blood, tissue, semen, etc, is obviously an essential control measure. Other screening has proved a controversial issue, however, on which there has been little agreement. Epidemiological surveillance and health care planning require the ascertainment of levels of HIV infection, for the future magnitude of the epidemic is primarily determined, in the absence of 'cure', by the current extent of HIV. It is often argued, however, that general screening, even of groups held to be 'high risk', is unjustified: if compulsory, it raises ethical problems; if voluntary, it is inefficient for epidemiological purposes because of selection bias in the participants. There are also the practical problems (besides, in developing countries, the question of resources) of what is to be done with, or for, those who are seropositive.

There are few countries where the compulsory HIV testing of some groups is not possible. There is, however, a wide range of practices from, at one extreme, the possibility of testing without consent only in very rare circumstances (eg where there is thought to be a danger to others, perhaps health-care personnel) and at the other, widespread mandatory testing. It should be noted that any compulsory testing (other than voluntary donors of blood or other tissues or organs) was declared 'inconsistent with international human rights standards' by the International Consultation on AIDS and Human Rights, July 1989[3]. Nevertheless, most administrations have seen their duty to protect the health of their populations as over-riding, in some cases, the rights of particular groups of individuals. In the US, there are statutes permitting the testing without consent of persons convicted of crimes associated with the possible transmission of HIV – assault, rape, or the sale or use of illegal drugs.

The mandatory screening of whole populations is a draconian course which is obviously expensive. It has been attempted in Cuba, and in the USSR, where 55 million of the population are reported to have been tested. In Bulgaria, almost a third of the population had been tested by December 1989, finding only a few HIV-positive individuals. Total population screening was abandoned in Romania late in 1989 because of lack of resources.

If total population screening is rejected, the compulsory screening of target groups may be substituted. Screening may be mandated for 'cases presumed to be infected' (in Finland, Bavaria, Israel, Japan, Louisiana in the US) or persons thought to be 'an imminent threat to public health' (Florida, Texas, Nevada and many other states of the US). In several countries, testing can be applied, even without consent, to patients who are thought to put medical staff at risk. In Peru, all hospital patients may be tested, and in the USSR, patients who have been receiving polytransfusions. Patients attending STD clinics are automatically tested in some countries (eg Hungary, Czechoslovakia). Hospital staff are tested in Iceland.

More specific groups thought to be 'at risk' may also be chosen for compulsory screening. This applies to foreign students in many countries, with the deporta-

tion of those found to be HIV-positive. In certain countries, eg Romania, USSR, Chile, N Korea, Cayman Islands, homosexual men have been compulsorily tested. Prostitutes are subjected to mandatory testing in countries as varied as Austria, India, Bangladesh, Hungary, Greece, Somalia, USSR, East Germany, Cayman Isles, Singapore, Japan, or N Korea. In thirteen states of the United States women charged with or convicted of prostitution may be tested, though enforcement is erratic and depends upon the stance of public health departments. Drug users who are convicted of offences or in treatment centres are compulsorily tested in many countries, including Italy, Singapore, Bahamas. Inmates of prisons are a group who give cause for concern, because of IV drug use and homosexual practices in prisons, and prisoners are compulsorily tested in many countries (eg Greece, Portugal, Bahamas, Bangladesh). In the US some states test all new prison inmates, and many test selected prison populations.

A requirement for premarital screening is enacted in a few countries with the 'hardest' policies, such as Bulgaria. Several states of the United States have also considered mandatory premarital screening (everywhere encouraged), but the only states in which this was enacted were Louisiana and Illinois. In Louisiana, the regulations were repealed a year later, and in Illinois only 8 individuals were identified during the first six months, at a cost of over US $300,000 per HIV-positive individual. Applications for marriage licences in the state declined by 22.5 per cent, and it was concluded that the practice was not cost-effective[4]. Utah has banned the marriage of persons with AIDS. Pregnant women and their newborn infants are groups commonly tested, since they are (in the developed world) normally in touch with services and undergoing other blood tests. In less-developed countries, pregnant or childbearing women who are in hospitals are among the groups most likely to be tested. Only a few countries (eg USSR, Portugal), however, have enacted universal and compulsory testing of pregnant women.

Screening for epidemiological and surveillance purposes

For some of the above groups the purpose of mandatory screening may not only be the identification of individuals who are infected, but also general epidemiological surveillance of the epidemic. This is something which must of course concern even those countries which reject compulsory screening except in very special circumstances. It has, however, caused great controversy. There are special ethical grounds against imposing compulsory identified screening in the case of HIV, since no 'cure' can be offered; moreover, the possibility, however slight, of 'false positive' results, or of 'false negatives' during the 'window' period of infection, may have particularly disasterous consequences for the individual concerned. Thus anonymous screening is more generally favoured, stripped of identity. Here also there have been ethical objections, however, since disease is being identified without the possibility of counselling the individuals concerned or warning them about the risk they carry for others. Anonymous studies of 'sentinel' populations – often those where blood is being collected for other purposes – are common in the US and endorsed by the WHO, but in Europe these disagreements have delayed the conduct of such studies.

The US and Britain provide contrasting policy examples. The importance of 'blind' seroprevalence testing was realised in the US soon after the development of the test in 1985. Though there was some debate about whether 'informed consent' was necessary, it was generally argued that the costs to civil rights were justified, and opposition from civil liberties groups and 'gay rights' organisations was short-lived. Legislative amendments to existing regulations were made quickly, for instance in California where confidentiality legislation had been enacted in a way which might have prevented anonymous screening. 'Blind' testing in hospitals and for the newborn has been common since 1988. However, with the advent of an effective treatment – zidovudine – which appears to delay the onset of AIDS, new controversy about anonymous studies arose in 1989. Now that some action could be taken for patients, the ethics of identifying disease without informing the individuals concerned were again called into question.

In Britain, proposals to undertake anonymous screening provoked extended controversy for several years. Though supported by most of the relevant professional bodies, and not opposed (given guarantees of confidentiality) by eg gay activists, it was argued by some public health interests and administrators that such screening was an invasion of privacy and would not produce useful results[5]. It can be noted, of course, that testing of this sort is common in infectious disease surveillance. In 1987 anonymous screening was rejected in favour of expanded, named, voluntary testing. However, in 1988 this decision was reversed, in principle, with an opting-out clause as a concession to ethical objections: though consent to testing would not be explicitly sought when blood was taken, individuals nevertheless had the right to refuse, specifically, to permit the blood to be used for HIV testing. Anonymous testing did not begin until 1990, among genitourinary clinic patients, drug clinic patients, hospital patients, pregnant women and newborn infants in selected locales.

In other countries in the West, similar controversies have emerged, though in most, 'sentinel' screening for epidemiological purposes does now take place. In less developed countries, with limited resources for screening, epidemiological screening is likely to be confined to research studies, hospital patients, or specially-funded local community studies.

Individual voluntary testing

HIV testing voluntarily undergone by individuals is the only source of the 'known' – rather than estimated – prevalences of infection quoted earlier for different countries. These are not, of course, available if HIV is not notifiable, and even where the results of these tests are centrally collated they have obvious limitations as

true prevalence figures.

Notification is one policy issue on which countries may differ: whether or not testing is actively encouraged is another. In several countries, widespread voluntary testing is a cornerstone of policy (eg Germany, Sweden). In Sweden, over a million and a half people had been screened by the end of 1990. The cost of this testing was estimated at two and a half times the cost of HIV/AIDS care, and the proportion of seropositive individuals identified in this way was declining: it was suggested that those most at risk were perhaps not coming forward for testing[6]. Voluntary testing, with its assumption of individual responsibility, was nevertheless seen as the key policy for prevention. In the US, with testing encouraged, approximately 2 million people had undergone tests by late 1989, allowing for duplicate testing of individuals. On the other hand, widespread testing has not been encouraged in eg the Netherlands. In the UK, it has been opposed by some medical interests, on the grounds that it is not functional to diagnose disease about which nothing can be done, and by some activist movements, on the grounds of the discrimination and other adverse social consequences which may follow. The official policy of discouraging widespread testing was reversed in the UK only at the end of 1990, when those who thought they might be at risk were advised to obtain tests. In all countries it is agreed that testing should always be accompanied by counselling, and this is a strong recommendation of WHO.

Confidentiality and contact tracing

Whatever the practices regarding screening or testing, the question of confidentiality has raised public and professional debate in many countries. It is indicative of the 'special' status of this disease, and the stigma which may be attached to it, that the issue has caused so much controversy, and that special regulations or legislation have commonly been enacted. Confidentiality between doctor and patient is of course a principle of medical ethics, but conflict arises between the rights of patients and those who may be in contact with them, whether other members of the public or health service workers. Provisions for complete anonymity of testing vary greatly, ranging from those (many) countries where anonymous testing is not possible, through those countries where identities are recorded but strict confidentiality imposed upon doctors, to those (such as Denmark or [West] Germany) where the emphasis is upon complete anonymity. In the United States, almost half the states have enacted special statutes protecting the confidentiality of HIV-related information. The tension between individual rights and disclosures felt to be necessary for public health purposes has meant that increasingly there has been a proliferation of exceptions to confidentiality. Gradually, the lists of people who may be informed have been expanded, especially (as in, for instance, many states of the US, Sweden, or the UK) including health care personnel. Other exceptions may include emergency workers, funeral directors, schools, and spouses. It can be noted that such lists include some who are in fact at very low risk, and commonly exclude others (eg partners who are not spouses) who may be at high risk.

In countries with well-developed health-care systems, the attempt to trace the contacts of infected persons is a well-established public health measure for the control of STDs. Because of the particular sensitivity about confidentiality, there is little consensus about contact tracing, or about partner notification, in the case of HIV/AIDS. WHO and the Council of Europe[7] have in fact suggested that in the interests of confidentiality there should be no obligatory contact tracing or informing of others, such as health personnel: the passing on of information should only be by consent.

In many countries, such as the UK, contact tracing is left to the discretion of clinicians, though infected persons would always, of course, be counselled to inform their partners. Whether a doctor has a right or a duty to inform partners or others even in the absence of consent is still left problematic. The professional body has pronounced that 'the doctor may consider it a duty to inform any sexual partner', thus leaving the issue to individual ethical decision. In practice, the sharing of information with other health professionals is widespread.

Similarly, in the US problems are acknowledged because of the conflict between the duty of confidence owed to the patient, and the liability for failure to protect identifiable third parties from harm. Contact tracing programmes are promoted federally, and in 1988 the adoption of partner notification practices was made a condition for the receipt of funds from the federal prevention programme. This was resisted by those states most heavily burdened by AIDS. The position varies from state to state, and both the 'duty of confidentiality' and the 'duty to warn' have been the subject of tests in the courts.

In other countries (Denmark, Norway) there is strong opposition to official contact tracing and confidentiality is absolute in most circumstances. On the other hand, there are countries in which vigorous attempts to break the chains of infection are seen as a primary public good. It has been argued that the example of Sweden has shown that there can be an effective system by which people at high risk can be identified and offered testing[8]. One study from three clinics in Göteborg 1985-88, in which 91 index patients made known 188 contacts, found that 38 HIV-positive individuals were identified, 21 of whom were previously unaware of their HIV status[9]. In eg Austria, Greece, Hungary, Malta, Czechoslovakia, Poland, Romania, [East] Germany, and Norway those who test HIV-positive are obliged to assist with contact tracing; in eg Iceland and Finland, there is an obligation upon doctors to inform the infected person's sexual partners if possible. In Iceland and Sweden, contacts are legally bound to submit to testing. In several countries, eg Czechoslovakia, Sweden, Bavaria, a number of Australian states, and Norway, those who test positive may be subject to directives about their sexual behaviour. Strict social controls are provided for in a few other countries, eg Bulgaria, where those with AIDS or HIV infection are legally liable if they transmit the infection.

Prostitution

It was obvious, in the review of the epidemiology of AIDS, that prostitution has very different associations with the spread of HIV in different parts of the world. In many developed countries, prevalences among female prostitutes are very low, unless they are also drug users. In other countries, especially those of Pattern II, prostitutes are very heavily at risk. It is sadly ironic that in the first case prostitutes have been the focus of fears about AIDS, and the subject of many countries' regulations, while in the second case social and economic structures are commonly such that any control of prostitution is almost impossible. It is also possible – as in the case, for instance, of Thailand – for factors concerned with the tourist industry to intervene. In that country, when the extent of infection among prostitutes was recognised, brothels were not closed but (as a formalisation of existing testing practices) identification cards were issued to HIV-negative prostitutes in 1990. This practice, designed to reassure clients, has been criticised as leading to a false sense of safety.

The nature of any official controls applied to prostitution are, of course, likely to depend on the existing attitudes existing in the country. In some, prostitution is acknowledged and to some extent already controlled. In Austria, prostitutes are registered and licensed, and required to undergo regular testing. In Bavaria, prostitutes can be tested three-monthly, and are obliged to use condoms in their work. In France, during 1990, there were calls for the reintroduction of licensing of brothels. Other countries have adopted policies of 'abolishing' prostitution by decriminalising the practice, while usually retaining legal sanctions against a range of activities (soliciting, brothel keeping) surrounding it. These may have the disadvantage of criminalising, and thus separating from health or supportive services, those such as street prostitutes who may be most at risk. In the Netherlands, a combination of control and freedom is applied: prostitutes are not registered and remain anonymous, while their management is regulated. In other countries, such as Japan, prostitution is completely hidden, since it does not officially exist. Prostitution may exist under different labels: in the Philippines, for instance, it is formally banned, but there are high rates of infection among 'hospitality girls', leading to attempts at their registration and HIV testing. In many countries, there is some hypocrisy: prostitution is not in most circumstances illegal, but its extent is rarely acknowledged and any systematic educational contact with prostitutes is difficult.

There are, of course, alternative methods of controlling prostitution and its risks, besides the use of mandatory licensing and testing. These might include the supply of condoms, easy access to health services, and the provision of alternative means of earning income. These are particularly appropriate in those less developed countries where prostitutes are most at risk. For the most part, services for the assistance of prostitutes have been instigated by coalitions of sex workers themselves and by non-governmental organisations, whether in the more developed countries (eg the Scarlet Alliance in Australia, the Red Thread in the Netherlands) or the less developed.

Intravenous drug use

Users of illegal drugs are an obvious target for control measures. In many countries, known IV drug users, those coming for treatment, or those identified by law-enforcement procedures, are subject to mandatory testing. The attitudes which are taken will again, however, depend on the existing stance to drug users. In some countries – for instance, Japan – there are very strict drug control laws, and drug use tends to be concealed. In most states of the US needles cannot be bought without prescription, and the carrying of them can lead to arrest: this may lead to equipment being hidden, and contribute to the existence of 'shooting galleries' where it can be rented. In other countries, the advent of AIDS has stimulated the development of new approaches to drug programmes. Since AIDS can be seen as a greater threat to general public health than drug misuse, 'harm minimisation' – policies designed to prevent the spread of HIV by the sharing of needles, rather than directly abolish drug misuse – has been promulgated. In 1989 the first major British Commonwealth conference on drugs strongly recommended these policies to governments.

Harm minimisation programmes may include teaching users safer practices, specific encouragement towards the sterilisation of injecting equipment, the easier commercial provision of needles and syringes, or schemes for the exchange of used needles, and the wider use of methadone maintenance in order to reduce injecting of drugs. Support for this type of programme was strong in, for instance, the Netherlands even before HIV emerged as a problem, and one of the first needle exchange schemes was set up by a union of drug users in response to hepatitis B danger, in 1984. Now, syringes are available from automatic dispensers. In that country methadone replacement therapy became freely available in 1979. More recently, many Western countries have adopted measures of harm minimisation: in Denmark, public needle dispensers are provided; in Austria, needles and syringes may be purchased without restriction; in New Zealand, there is a national needle and syringe exchange scheme operating mainly through pharmacists; in France, there are pilot exchange schemes and unrestricted access to equipment in pharmacies; in Poland, where there are thought to be at least 16,000 IV drug users, a needle exchange scheme unique in Eastern Europe was begun in 1989. The UK represents one of the most dramatic instances of drugs policy actually being to some extent reversed. In 1988 a policy which had been moving towards greater restrictiveness had its priorities changed towards risk minimisation, with an emphasis on outreach work and counselling, and several pilot schemes for needle exchange.

Methadone maintenance is seen as an important part of AIDS-related drug policy in several countries, such as Sweden, Holland, Australia and parts of (West) Germany. In others, such as France, the issue has roused great controversy.

The 'harm minimisation' approach has presented widespread problems generally, because many countries or groups within countries see it as condoning drug misuse, and prefer vigorous policing methods in

the 'war against drugs'. In the US needle exchange schemes have been fiercely controversial: experimental programmes exist, but there is general opposition from law enforcement interests. Needle exchange was proposed in New York as early as 1985, but was condemned not only by those favouring the moral appeal to abstinence, and by law enforcement agencies, but also by black community leaders who saw it as encouraging 'genocidal' drug use in the black population. Since 1988, in particular, there have been calls in the US for increased drug treatment programmes, but these have had to face ideological opposition to budgets for drug misusers.

Prisons

Prisons present adminstrations with particular problems. Their inmates may include drug users, and the prison environment itself is conducive to spreading the virus. It is widely believed that the prevalence of HIV infection and of 'risky' behaviour – needle sharing and homosexual sex – is almost wilfully underestimated in many countries. There is some obligation upon authorities to prevent the spread of infection among those in their 'care', and even to prevent the possibility of deliberate attacks by the infected upon other inmates or staff (an issue which has been the cause of prison riots and strikes in Australia and Belgium).

Segregation of HIV-positive prisoners is widely practised, eg in Belgium, Ireland, parts of the United States, Brazil, or parts of Australia. Segregation is, of course, more practicable where the numbers involved are not great: it has been commented that in New York City "such a strategy might well require the creation of a parallel prison system"[10]. The United Kingdom offers an example of a typical compromise: prisoners are not compulsorily tested, but there is pressure upon those who belong to obvious 'at risk' groups such as drug users, and if testing is refused the prisoners may be treated as though they were infected, including segregation with those who are known to be HIV-positive. Segregation is authorised under normal 'viral infectivity' regulations, leaving room for local interpretation. Indeed, some UK prisons operate policies of desegregation, and education about 'safe practices' for all, the alternative preferred by WHO and practised by several other European countries.

There are certain obvious policies which reduce the risks of the spread of infection in prison. The provision of condoms is one, and several countries take this course, including the Netherlands, Switzerland, and Luxemburg. In Ontario, Canada, condoms are supplied to teenagers, but not to adults. In Spain, condoms are distributed and drug users are encouraged to stop injecting or at least to clean equipment with bleach which is provided. In other countries, the measure is totally rejected on the grounds that it is condoning homosexuality, which may be (as in the UK) illegal in prison though not outside.

The question of the distribution of needles for drug users in prisons is even more controversial, and nowhere practised. The more positive course of active help and treatment for IV drug users in prison, including methadone maintenance programmes, is rare. The Australian National AIDS Strategy advocates access to methadone programmes, and the provision of bleach for cleaning needles, as well as the supply of condoms. Actual practice varies between states.

Conclusion

The lessons which may be learned from a comparison of control measures will be discussed at the conclusion of this monograph. It must already be obvious, however, that – largely in the developed world – there is a wide variety of approaches to the problems of surveillance and control. Reactions are necessarily strongly influenced by the particular pattern which the epidemic has shown, and countries which are politically and economically not dissimilar have chosen very different approaches. The policies of a selection of countries are summarised and compared in Table 3.

It must, however, be noted that policy and practice cannot be assumed to be the same thing. The passing of legislation does not necessarily mean that it is applied, or applied uniformly. In some cases, administrative departments may operate on different policies: conflicts between law enforcement and health interests have been common in the areas of drug policy and prostitution. Always, discretion may be applied at local levels.

Table 3 **Examples of control policies**

Country	*Policies*
Australia (moderate prevalence)	AIDS a notifiable disease, HIV infection also in some states. Anonymous reporting of HIV-positive, but some states require named notification, with confidentiality safeguards. 'Wilful' transmission of HIV a criminal offence in some states. Voluntary partner notification but an offence for those with AIDS/HIV not to inform sexual partners, in some states. Potential immigrants tested but HIV does not automatically exclude. States encouraged towards harm minimisation for IVDU; needle exchange schemes; methadone programmes in prisons. Decriminalisation of homosexuality, prostitution, though some states retain. Universal infection control in hospitals; no testing of patients. NSW tests prisoners on entry and leaving. No segregation of prisoners in most states.
United States (high prevalence)	Mandatory reporting of AIDS, all states, and HIV-positive, 33 states, often named, but with confidentiality safeguards. Contact tracing required or authorised, many states (with consent only, in California). Criminal prosecutions occasionally brought for HIV transmission. Several states with special legislation. Many states authorise isolation or restriction of personal liberty for 'recalcitrant' persons with HIV/AIDS, either by designating as STD and including under existing legislation, or by special statute. Mandatory testing of prisoners possible in 14 states, prostitutes 13 states, sex offenders and IV drug users many states, mentally ill and retarded Texas, Washington and Wisconsin. Premarital testing two states, now ceased. Pregnant women tested for HIV with other STDs, Florida, Michegan. All recruits and active-duty personnel in armed services tested, all recruits to Peace Corps, Job Corps. No immigration of persons with HIV/AIDS. Entry restrictions on those with HIV now rescinded. Most states segregate prisoners with AIDS/HIV. In most states, drug policies strict: no needle exchange schemes, possession of hypodermic syringe illegal. Encouragement of voluntary testing. Many 'blind' seroprevalence surveys, eg in hospitals, of newborn. Specific confidentiality statutes enacted in many states, eg in California as early as 1985.
Denmark (moderate prevalence)	Anonymous testing available, AIDS registered without any personal details, HIV not registered. Strong opposition to contact tracing and emphasis on complete confidentiality. Needles and syringes freely available to IVDUs, public needle dispensers in Copenhagen.
Sweden (moderate prevalence)	AIDS covered by legislation for other STDs. Mandatory reporting of AIDS, but can use code number on demand for confidentiality. High rates of voluntary testing. Confidentiality preserved even between doctors except by consent. Individual who suspects infection is legally bound to seek test. Doctor mandated to trace contacts if possible, and contacts legally bound to be tested. Mandatory testing possible for 'suspicious cases'. Provision for forcible hospitalisation. Vigorous policies to control supply of drugs.
Japan (low prevalence)	Mandatory anonymous reporting of AIDS/HIV: those infected sexually or by drug use legally distinguished from those infected by blood products or transfusion. Named reporting in certain circumstances. Provision for compulsory testing. 'Suspect' foreigners tested on entry. Powers available for exclusion of HIV-positive immigrants. Strict drug control legislation. Prostitution nominally prohibited. Homosexuals not legislated against, but no protection against discrimination.
Bulgaria (low prevalence)	Testing of whole population intended, suspended on economic grounds when one third completed. Male homosexuals, prostitutes, IVDUs, traced through police files and tested. Pregnant women tested, also marriage applicants (though not prevented from marrying if positive). All those HIV-positive must inform doctor, dentist; declare status to sexual partners; sign contract promising abstinence from risky behaviour; subject to biannual medical examination. Partners and families counselled. Foreigners staying 30+ days require HIV-free certificate. Nationals returning from abroad for 1 month+ tested.
Cuba (low prevalence)	Testing of whole population mandatory. Notification of AIDS and HIV-positive. Quarantine (for life or until 'cure') of HIV-positive. Foreign entrants, and nationals returning from 'endemic' areas, tested, but not tourists.

Measures for surveillance and control are only one side of prevention policy, and it is obvious that they can never be wholly successful. The second side is public education, in an attempt to alter the behaviour which puts individuals at risk. Modelling techniques have shown how dramatically future patterns of infection could be influenced by safer sexual behaviour, with a drop in the rate of partner change producing a disproportionate reduction in transmission[1]. In those developing countries where formal control measures are difficult, education may be the only hope of prevention. In developed countries the balance chosen between enforced control measures and education of the population towards accepting individual responsibility varies depending on ideological factors. All countries do, however, have programmes of public education, focussing on the use of condoms, the avoidance of 'casual' sexual relationships, reduction in the number of sexual partners, and the avoidance of the more risky forms of sexual intercourse.

The attempt to regulate sexual behaviour is not new: most societies have always sought to control it by formal and informal means. By the same token, however, every society has always failed to regulate it completely. In the case of HIV, there are special problems. It must be noted that the 'behaviour change' which education seeks to promote covers a wide range of practices, among very varied social groups – homosexual and heterosexual practices, the sexual norms of young people, or travellers, or tourists, or the clients of prostitutes, the needle-sharing behaviour of drug addicts, the sexual behaviour of those infected by other than sexual means, and so on. There cannot be one simple message. Moreover, a baseline – accurate knowledge about the patterns of actual sexual behaviour in the population – has until very recently been generally lacking: one of the consequences of the epidemic has been an opening up of previously hidden areas of life in almost every society.

Obviously, large-scale surveys of sexual behaviour – with all their problems – have been necessary. Nevertheless, they have met with political opposition, notably in the United States and Britain. In Britain, a national survey was refused government funding, but commenced in 1990 with support from a private trust. In France, a major survey funded by the national health authority also began in 1990. In that year Norway, Sweden and the Netherlands completed their surveys. In developing countries, WHO is coordinating studies, having designed (1988) the first phase, for use in Africa, of a programme of surveys on 'Partner relations and risk of HIV infection' which can be compared internationally. Studies have been conducted in, for instance, Uganda, Tanzania, Nigeria, the Ivory Coast, and the Central African Republic, and also in Singapore, and Thailand. Fewer Asian countries are participating, partly because of cultural objections to asking questions about sexual behaviour. A second phase of WHO's programme includes protocols for use in North and South America and in Europe, with more detailed follow-up studies.

Problems of educational campaigns

Even if it is possible to produce accurate information about what needs to be changed, there are many practical and policy problems which governments face. To whom should they be directed, and what should be their tone? The UK chose first to address the general public as a whole, and only subsequently to focus on specific groups, attempting to raise general awareness and concern. In other countries, such as the Netherlands and Spain, there was a deliberate avoidance of creating general fear. Initial campaigns in France were low-key, with a minimal message. In (West) Germany, the theme of self-responsibility was paramount, with campaigns directed at the general population and at adolescents, designed to allay fears but encourage voluntary testing.

Everywhere, problems have been caused by a conflict between those interests (which may, of course, include religious groups) which would take a 'hard' moral line, suggesting that the only true preventive action is the promulgation of totally monogamous heterosexual behaviour, and those which would take a more pragmatic and permissive attitude, suggesting that sexual (or drug injecting) behaviour should simply be made 'safer', since it is unlikely to change fundamentally. In the United States, for instance, the dilemma of providing educational programmes directed at homosexuals, which did not appear to condone homosexual behaviour (criminal in 24 states), produced early conflicts. In 1988 the use of federal funds for the provision of AIDS education that 'encouraged' homosexuality was precluded, and the guidelines of the Centers for Disease Control prohibited funding of material that might be offensive by 'broad community standards'. Similarly, instruction about safer drug use was widely felt to be implicit toleration. In many other countries, there have been similar difficulties: in Zambia, for instance, conflict between church and state emerged in 1988 over AIDS education in secondary schools and the free distribution of condoms to hotels and prostitutes, which was claimed simply to be encouraging promiscuity. In Mexico, the Parents' Union and an anti-abortion lobby threatened the Health Minister with prosecution for promoting condoms, and in Namibia early attempts at health education were prevented by the objections of the Afrikaans Dutch Reformed Church to the promotion of contraceptives.

Churches have by no means always been unhelpful, however, and it is probably true that these dilemmas were most severe in the early years of the epidemic. In remarkably few years there has been, in most countries, a considerable change in public awareness about sexual matters, so that plain speaking does not so easily cause offence. The question of the education of children commonly still raises problems, however. The importance of the education of young people is generally acknowledged, since the high proportions of teenagers who are sexually active is well documented in many places, from the US to the cities of Africa. Young women are felt particularly to be at risk, since in many cultures girls lack the ability to control the nature of their relationships. Dilemmas arise because in many

countries it is not even acknowledged that teenagers are sexually active. Approval of education which appears to condone sexuality, while reducing its risk, is unlikely. It is generally argued that there is a need for education before children become sexually active. In many countries, agreement about the form of that education has proved difficult, and material for school children has been opposed or withdrawn. In many states of the US AIDS education is required at primary or secondary school level, but some insist that the stress should be on abstinence before marriage.

Other problems of public education policy arise if exhortations towards behaviour change are seen as deriving from an 'establishment' – in Africa, from a white or Western stance; among minority communities in the West, from the majority. As family planning campaigns, during the 1970s and earlier, were rejected in Africa as 'Western' attempts at control, so AIDS prevention techniques may be seen as interfering with national cultures. 'One partner only' rules may be problematic in parts of Africa where polygamy is traditional, for instance: thus Kenya and Uganda have, rather, adopted the slogan 'zero grazing'. Similarly, the perception of AIDS as a 'gay white disease' in the US has led to accusations of neglect of the poor black or latin community, and rejection by them of educational measures.

Effects of educational campaigns

Evaluations of national campaigns have, in general, found that although knowledge may certainly be improved, the causal chain between education, knowlege and behaviour is too complex to support any assumption that simple exposure to knowledge will lead directly to behavioural change. Programmes in developed countries seeking to impart information have generally and quickly been shown to be effective, with high proportions of populations knowing, for instance, the principal means of HIV transmission. (Substantial minorities usually remain with mistaken beliefs about, for instance, transmission by casual contact.) There is little evidence, however, of any general change in heterosexual behaviour, and many studies among both heterosexuals and homosexuals have shown that knowledge has no clear association with behaviour[2,3]. Surveys in many countries – an example is the British Health Education Authority's 'Strategic AIDS Monitor', repeated since 1987 – have found that condom use and numbers of sexual partners tend to remain constant.

A comparative evaluation of national campaigns in Australia, Sweden and the UK[4] concluded that they do not produce even short-term effects on practice for the general population. Simlarly, an evaluation of the Swiss 'STOP-AIDS' Campaign[5] concluded that any change was 'slow and discontinuous'. On the UK campaigns of 1986-7, pre- and post-campaign surveys showed no change in the reported number of partners or the use of condoms[6].

In particular, deliberate fear arousal, not related to personal experience, has had little recorded success as an agent for behavioural change[7]. The British media campaign of 1987, with its key image of a tombstone and its slogan 'Don't die of ignorance' had a successful impact, but came to be criticised on these grounds. The similar 'Grim Reaper' campaign in Australia, using death as a symbol, was equally thought to have no effect on behaviour, though it dramatically increased requests for HIV testing[8].

Special problems attach to such general public campaigns. The implication that everyone is at risk is unlikely to be taken seriously. The effect of panic may be to avoid the evidence, and in any case perception of risk is well known to be complex and often bear little relationship to reality, both generally and in the specific context of AIDS[9,10,11]. The messages of public education are necessarily over-simplified, given the complexity and uncertainty surrounding the epidemiology of HIV/AIDS[12] and there can be no attempt – as there might be with, say, smoking – simply to eliminate the behaviour concerned. All that can be promulgated is modification of practices. This is difficult enough in any population, given the private and emotion-laden nature of sexuality: it presents special problems among the most relevant populations. These are likely, in the West, to be young, mobile, urban, by definition sexually active, and among drug users to be poor, addicted, socially marginal, and in the US non-white – all groups most likely to be impervious to educational campaigns.

The central recommendation towards condom use also presents problems. Many studies have demonstrated generally negative attitudes towards condoms, and relatively low usage even among the well-informed – for instance, only 9 per cent of the population in France (1989). In Denmark, two-thirds of sexually active adolescents did not use condoms (1989), despite almost universal knowledge that they were protective[13]. In developing countries, and some others, condoms may simply not be available or affordable, despite limited supply by helping agencies. Moreover, their contraceptive function may rule out their use, where there is a desire to have children: traditionally, the death of infants increases deliberate fertility. In many countries, restrictive legislation on the sale and advertising of condoms has existed. A prosecution against the Family Planning Association for selling condoms took place in the Republic of Ireland as late as 1990. However, a number of countries – eg France, Belgium, UK – which previously banned advertising on the grounds of taste or religious objections have now liberalised their regulations.

Even where education and condoms are available, people may not be in a position to change their behaviour, or there may be strong cultural and social barriers to change. The problems of children and adolescents living on the streets, of women dependent on prostitution, and of wives in many developing countries who are quite unable to suggest condom use to their husbands, offer only a limited role for individual education.

Specific behaviour change

The immense amount of research and monitoring of particular groups throughout the world thought to be at high risk of infection has indicated a certain degree of behavioural change. There has been evidence of the adoption of safer practices by prostitutes in Nairobi, Kenya, Accra, Ghana, Athens, Amsterdam, and London. It is common, however, for prostitutes to insist on condom use with their clients, but not with their personal partners. There is also evidence of change in the injecting behaviour of IV drug users, for instance in Italy, the Netherlands, the UK, and some US cities. Among these groups, however, sexual behaviour is less likely to show change, with risk seen as relating only to injecting practices.

The most notable example of change, however, relates to homosexual behaviour. There is voluminous evidence from the US, Britain and elsewhere of a reduction in 'risky' practices, which is reinforced by trends in the incidence of HIV infections and other STDs[14,15]. The flattening of the curve for the prevalence of homosexually-transmitted AIDS in Pattern Ia countries is attributed to this response, which has been described as 'the most rapid and profound response to a health threat which has ever been documented'[16]. It has to be noted, however, that behavioural change in this group is by no means universal, and there has been widely reported 'backsliding', eg among homosexual men in Amsterdam in 1989/90[17] or, generally, among younger homosexual men. Moreover, the impetus for change appears much more likely to have been close and personal experience of the effects of the disease, rather than any programmes of public education. It is noted that the homosexual decline in STDs, especially gonorrhorea, and the deceleration in HIV infection, certainly began before there were extensive media or educational campaigns about AIDS.

Community, peer-group and self-help education

To the extent that it has been successful, education among homosexual men is generally acknowledged to owe more to peer-group activity than to national educational campaigns. There are, in fact, two dimensions on which countries may differ in their educational policies: the extent to which they favour prohibitive, moral approaches or pragmatic, harm-limitation ones, and the extent to which education is seen as the function of central health departments or as something which should be delegated and facilitated among community groups.

In most cases, of course, both central and community strategies are combined, though the UK could be seen as an example of a country largely favouring centralised education, and parts of the US as favouring action by non-governmental organisations. In developing countries, and those with problems of literacy or easy access to mass media, community strategies may be essential. Many developing countries have traditions of oral culture and community networks which are being utilised. National campaigns have had notable successes in some African countries: examples include Tanzania or Zambia. In Tanzania a National AIDS Control Programme, organised down to the 10-household level, and actively assisted by the Catholic and Lutheran churches, has achieved considerable awareness among the population. Zambia, helped by overseas assistance (in this case from Sweden and Norway) has trained health workers extensively and reached the majority of the population. Anti-AIDS clubs use schoolchildren to spread educational messages.

Similarly, in Western countries, 'insiders' – peer groups, AIDS Service Organisations (ASOs), and people with AIDS (PWA) groups – have had some success, where governmental educational policies have failed to reach their audience or have been prevented by political or other considerations from confronting difficult issues. In many Western countries information produced and distributed by organisations of homosexual men has been the best – sometimes the only, until recently – source of information. Two of the first were the Gay Men's Health Crisis in 1982 in New York and the Terrence Higgins Trust in 1983 in London. Other peer-group organisations or ASOs include the US National Association of People with AIDS, the organisations ACT-UP and Body Positive, Aides in France, the Bobby Goldsmith Foundation in Australia, the teenage volunteers of Youth Organisation against AIDS in schools in France, the Adolescent Treatment and Education Alliance of Los Angeles in the US, the Collective of Popular Education for the Prevention of AIDS in Nicaragua, The Society for Women and AIDS in Africa, the Women's Action Group in Zimbabwe, and countless others. Such groups are less likely to be constrained by moral problems, and more likely to be able to promulgate safe sex rather than no sex, harm limitation rather than abstinence, or an adaptation of lifestyles rather than a complete change. Occasionally, ASOs and peer-group organisations find themselves in conflict with the approach of their government, as has occurred in Brazil and at times in the United States. Part of the educational policy of most governments, however, is to recognise and support them, since these community-level, supportive approaches have been demonstrated to be the most successful in achieving change in individual behaviour.

7 DISCRIMINATION AND ANTI-DISCRIMINATION MEASURES

One of the thrusts of the educational policies which have been described is commonly to combat discrimination against people with AIDS, and other specific policy measures to this end are taken by many countries. Respect for human rights in general is a basic and proper motivation for such policies, but they also have other latent functions. Conflict within society is destabilising: moreover, stigma and discrimination are likely to drive groups at risk, or individuals who may be infected, underground, making control more difficult.

In a statement to the General Assembly of the United Nations, 1987, Jonathan Mann pointed out that in reality three epidemics exist, as phases of the invasion of communities by the virus. First – often unnoticed – is the invasion of infection with HIV. Second, there is the invasion of disease. And third, there is the epidemic of social, cultural and political reaction, which is 'as central to the global AIDS challenge as the disease itself'[1].

This wave of reaction has had consequences at both the societal and the individual levels. Waves of 'blame' for the supposed origin of the disease (though in fact the origin remains unknown), especially during the first half of the 1980s, were undoubtedly harmful for international cooperation and policy. In the Third World, the perception that Western media were expressing racist views in suggesting that the virus originated in the African sub-continent caused great bitterness, sometimes resulting in countries denying the existence of AIDS in their communities. Counterclaims were heard of an origin in US bacteriological experimentation, or of spread by US military personnel. In many countries, 'blame' has been placed on African students. On the other hand, the 'degenerate West' or the 'capitalist world' has been seen as the infective danger, as in the Middle East, or Japan, or Eastern Europe. In Romania it was reported that testing for HIV was banned as late as 1989 because the disease was held to be one of 'Western decadence', even though a few seropositive children had already been identified.

To blame others for an epidemic problem is historically common, as the examples of plague, syphillis, or even influenza show. These successive waves of blame, accompanied by sensational media reporting, have had various unfortunate policy consequences, since they can attract attention away from effective action and discourage accurate reporting. Authorities have wished to avoid alarming their populations and discouraging trade or tourism, and have therefore attempted to control information. This can lead to misconception in the populations of African or other countries, with AIDS seen as 'a white man's disease'. Uganda was the first, and for some time one of the only few, African countries with an open policy for reporting its AIDS epidemic. This had the effect of attracting support from Western nations, but during 1986-87 also attracted a great deal of much resented media attention. In 1985 an issue of a US paper discussing AIDS among prostitutes in Nairobi was certainly banned, and this and other media events seen as a 'smear campaign'. Similarly, it was reported that one particular newspaper article in Britain in 1986 had widespread consequences for collaboration in research in Zambia.

Within countries, similar waves of accusation and blame occur. It was combinations of circumstances which led to the epidemic being first recognised in 'Pattern I' countries, since these were countries with the most highly developed medical and surveillance systems. Their particular epidemics resulted in the disease being seen, initially, as essentially one of already stigmatised groups – homosexual men and drug misusers. The first waves of ugly homophobia, with their identification of the infection as 'the gay disease', are perhaps over in these countries. However, as the pattern of the epidemic has changed, particularly in the US, it has become concentrated in other already stigmatised groups – the poor and disadvantaged in low income city areas. Increasingly, infection is striking those outside the reach of physicians: it has been estimated that of the homeless in New York City (numbers of whom may be as high as 70,000) 20-30 per cent are HIV-positive. In the US, AIDS prevalences for blacks and hispanics are accelerating at a greater rate than for whites. Black and hispanic women account for 72 per cent of all women with AIDS, and black and hispanic children for 77 per cent of all children, compared with 40 per cent for adult males. In other countries, immigrant workers and students from African countries have been publicly stigmatised. In those countries where homosexuality is still illegal, hidden, or the object of cultural dislike, AIDS has provided the impetus for attacks upon homosexual men. Moreover, the fear that administrations may have that publicity may unmask prejudices that already exist in their populations may actually affect policy, encouraging attempts to de-dramatise and discouraging full public information. It has been argued that this was an issue in Poland with regard to public intolerance against homosexuality, and in Belgium with regard to the African population[2].

Forms of discrimination

In part because of this association, in very many countries, with stigmatised groups, and in part simply because of the genuinely frightening characteristics of the disease (perhaps especially in the West, where populations have become used to thinking of disease as 'conquerable' by medical science), there is fertile ground for discrimination against individuals. Discrimination can, it has been suggested[3], be either proactive (by explicit policy decision) or reactive (the immediate and *ad hoc* reaction to the individual). It can also be either direct and explicit, or indirect, hidden behind regulations which do not openly refer to HIV status. Reactive discrimination is, of course difficult to combat, and indirect discrimination may appear to be neutral and remain unidentified until its effects become apparent.

Individuals with AIDS, or even those who are known to be HIV-positive, have been widely subjected to harassment, abuse, breaches of confidentiality, and discrimination in employment, housing, and insur-

ance[4]. Particularly in the early years of the epidemic, there was anxiety in the US and other Western countries about the stigma and exclusion experienced by HIV-positive children in schools. Most reports of discrimination come from urban areas and western nations, since they reflect the existence of advocacy organisations or anti-discrimination agencies. In fact, sanctions may be more strongly applied in rural areas or in poorer countries, though with less publicity[3].

There can also be discrimination in medical care, and reports of problems ranging from the reluctance of individual health workers to treat AIDS cases, to the adoption of discriminatory policies by professional bodies and governments have been frequent since the early years of the epidemic[5,6]. There have been many accounts of unreasonable fears leading to over-reaction by medical staff, police, or ambulance personnel. In those countries where medicine is largely privately organised, non-discriminatory care is, of course, not easy to legislate against. Discrimination against health-care workers who are themselves HIV-positive is also emerging as a problem[7].

Discrimination in employment can arise through the hostility of other staff, fears of customer reaction in those occupations where this is relevant, or the concern of employees about the financial implications of employees who may be a poor health risk. There have been many reports of dismissal (or suspension from work, if this is legally easier for the employer) of those known to be HIV-positive, and in Western countries or among multinational employers screening as a condition of employment is widespread. Given that an HIV-positive employee may be completely without symptoms for many years, and that one screening test can say little about the future, these practices are difficult to justify.

The question of discrimination in insurance similarly presents difficulties, given that life insurance or health insurance inevitably involves a measure of discrimination against those held to be 'poor risks'. There is general refusal to provide such insurance for those with AIDS and those who know they are HIV-positive. This may extend to eg travel insurance. There is also widespread use of exclusion or cancellation clauses (in health but not in life insurance contracts), terminating benefits for those who become infected. This discrimination against a particular medical condition, not applied to others, is held by insurance companies to be necessary in order to limit their potential financial liability: its consequences are, of course, particularly serious for the individual in those societies where insurance schemes are relied on to meet medical costs. A possible consequence may be, in some cases, a reluctance on the part of doctors to report an illness or a death as AIDS-related, when the results will be so severe for the patients or their families.

The practices most strongly accused of being discriminatory, however, have involved attempts to screen out those seen at risk. Almost universally, sickness insurance or life insurance over a modest limit requires HIV screening, at least for particular population groups. Doctors reporting to insurance companies on the health status of prospective policy holders have commonly been asked to provide assessments of their sexual lifestyle, though in some countries there has been professional resistance. Individuals perceived to be specially at risk – notably, young single men – may be asked by some companies for higher premiums, and if they have previously undergone HIV testing (with negative results), may be automatically assumed to have risky lifestyles. There are, however, differences in practice between countries and between insurers within a country. The refusal of insurance cover to those who are HIV-positive, or even to those thought to be at risk, is of course particularly serious if insurance is necessary for the obtaining of a mortgage for house-purchase.

Some attempts have been made to prohibit the requirement of HIV testing for insurance purposes. In France, for instance, it is recommended that insurance companies (and employers) should not request HIV tests or information on them, except for insurance over FFr. one million. Other partial solutions to the problems have included AIDS 'contingency policies', with additional payments, or the legislation in some states of the US to allow for 'accelerated death benefits', that is, the use of life insurance benefits to pay for health-care expenses in advanced stages of the disease.

Anti-discrimination policies

Discriminatory practices fuel the mistaken fears of casual transmission from which they often derive, and obviously make those who may be at risk reluctant to be identified. Anti-discrimination measures are therefore an important part of policy in most countries. They may rest on general human rights legislation, an example being the adoption by the Council of Europe of a policy which affirms international human rights treaties and adapts them to HIV/AIDS. Alternatively, they may rest on legislation already enacted against discrimination on the grounds of disability or illhealth, or they may be new and specific to AIDS.

In several countries, there has been much debate about whether unfair treatment is already unlawful under existing disability statutes, or whether AIDS-specific laws are needed. In the US, for instance, the Federal Rehabilitation Act (1973), which prohibits employment discrimination against handicapped people (but does not, however, extend significantly to the private sector) has been judged to apply to people with AIDS, and probably to those who are HIV-positive. A new and wider Disabilities Act (1990) explicitly includes both. All states of the US also have legislation to protect the handicapped, and many have extended it to include AIDS. About half of the states have gone further, and enacted special statutes for HIV/AIDS, focussing on housing, employment and insurance. An example of an early and comprehensive city anti-discrimination ordinance is that of Los Angeles, passed in 1985, which prohibits discrimination in employment, rented housing, business establishments, educational establishments, and city facilities and services, not only for those with AIDS or HIV infection, but also for those who might be perceived to be at risk. Similarly, New South Wales in Australia has

an anti-discrimination act which specifies not only HIV status, but also sexual orientation, as a protected area, and a federal 'national strategy' of 1989 called for similar legislation in all states. In other countries with clear anti-discrimination laws applying to HIV/AIDS – for instance, Canada, where it was established at the end of 1989 that HIV infection is a disability within the meaning of the employment legislation – it may not be illegal to discriminate on the grounds of sexual orientation, thus providing a loophole which can be used to exclude homosexual men. Elsewhere, as in the UK, anti-discrimination laws for the disabled, though they exist, are not so clear-cut, and there is no agreement as to whether HIV/AIDS is included. Thus there are no procedures on which employees can rely except the general safeguards against 'wrongful dismissal'.

Lobbies for those affected have, of course, not always favoured the designation of HIV infection as a 'disability'. On the other hand, many governments have been reluctant to pass specific legislation, either on the grounds that it is disfunctional to select out and label those with HIV/AIDS, or on the grounds of setting a precedent. Commonly, screening for particular occupations is expressly permitted, where the employer requires to insure the employee (eg airline personnel, those required to work abroad), or, with less justification, on the grounds that there are particular health requirements for a given job. Occasionally (eg in the state of Georgia in the US, or in Bavaria in Germany) employers for all or certain occupations are given the explicit right to screen employees or candidates for employment.

Where there are anti-discrimination ordinances, and whether they rest on existing legislation or are specific, their monitoring presents problems. In the US, states with a high prevalence of AIDS (California, New York) have been the more agressive, but enforcement is never easy. Victims of discrimination will not necessarily be willing to court publicity by taking a stand against it.

Since the advent of AIDS as a recognised problem, science and medicine have collaborated across national boundaries, not always without dispute, but certainly with a recognition that international exchange is essential in the face of a potential global crisis. With regard to policy on the containment and management of the problem, however, there has not been the same internationalism. WHO has, of course, promulgated programmes and assisted in information exchange. On the whole, however, it seems that nations have made little attempt to learn from each other.

Most countries have approached the very difficult decisions involved by seeking compromises. The epidemic is nowhere static, however, and continual readjustment has had to be made. In general, national formulation of strategy has been criticised as being initially slow and over-cautious.

Many countries' reaction has been cyclical, with periods of action and reaction, waves of concern followed by periods when the problem is down-played. In the US, for instance, the country which first faced AIDS as an emergency for public health, it has been argued both that control measures have been too lax and that they have been too strict. On the one hand it has been suggested that sufficiently strong measures were not implemented because of the lobbying of some high-risk groups and the strength of the civil liberties movement: on the other, that there has been over-reaction, with the imposition of measures which would never have been contemplated if less stigmatised groups of the population had been primarily involved[1]. In fact, viewed in world-wide perspective, the US has seemed – like most countries – to attempt a balance.

In every country AIDS is a policy issue, even if the current prevalence of the infection is very low (an example is Japan) and in most has caused some internal conflict. It also has to be acknowledged that much AIDS policy has been at the mercy of irrelevant issues, such as the timing of political elections in the US, UK, or Germany. Events of lesser importance in themselves can also become headlines and influence public perceptions, which in turn force governments to take action. In more than one country, the death from AIDS of a prominent public figure had disproportionate effects, in the earlier years of the epidemic. Similarly, publicity over two early female AIDS cases in Japan in 1986/7 forced plans for legislation, although it was not passed until 1988 when the original concerns had dissipated.

Perceptions of the epidemic have been as important as its true epidemiology in affecting public, and sometimes governmental, responses to it. In each country popular pictures have been built up at various times, especially in the media: examples include the 'myth of heterosexual AIDS' promulgated in the UK in 1990, the early image of the epidemic in Brazil which allowed the Ministry of Health to characterise it as a 'disease of the elite' in 1988, thus justifying a lack of public provision for diagnosis and treatment, or the mistaken image in African countries of AIDS as a homosexual disease[2].

It is tempting to place the countries of the world on

a crude scale, with at one end those which primarily stress individual rights, and attempt to encompass HIV/AIDS within their customary structures of disease control, and at the other those which see this as a unique threat requiring special measures, with a strong and authoritative pattern of control. This is over-simple, however. There is a great variety of background issues, all differing from country to country.

Different political and moral ideologies, though a basic feature, are only one factor. Others which influence policy are:

- the economic status of the country, the development of its health services, and the relative threat presented by AIDS compared with other endemic health problems;
- the strength and thrust of public health policies generally, and whether mass screening, mandatory reporting, and if necessary compulsory isolation are already acceptable;
- the strength of the medical establishment, and the extent to which issues seen as 'clinical' are left to professional discretion rather than public policy;
- the traditional ethos of the medical profession, and whether doctor-patient confidentiality is seen as inviolable;
- the existence of national policies regarding the chronically ill and handicapped, and whether AIDS is included;
- the extent to which a particular country's epidemic is concentrated among minority or disadvantaged groups, and the extent to which these groups are already discriminated against, or have any voice;
- the legal status of homosexuality, whether it is illegal (as in Russia or Chile) or strongly stigmatised (as in Japan), and whether there are stable gay communities (as in California, the Netherlands, or (West) Germany) which can take an active part in policy;
- the position of prostitution, whether it is acknowledged and controlled as far as possible (as in the Netherlands), is partially controlled but on the whole a 'hidden' area of society (as in the UK or much of the US), or is an accepted feature of social life (as in some Far Eastern or less developed countries);
- the attitude taken to drug use, whether it is severely controlled, and whether traditional methods of dealing with drug users have been strongly punitive or oriented towards care and cure.

In addition, the extent of political consensus within a country, and the extent of administrative centralisation, are important factors, though almost everywhere this issue has been kept out of party political conflict. This has usually been achieved by the creation of special advisory bodies, commonly dominated by medical scientists and professionals. Thus governments have been able to distance themselves, defining the issues as 'clinical' rather than 'policy'.

Traditional relationships between different levels of government, or between periphery and centre, have had their influence. In Germany, for instance, the courts have played an important interpretive role in conflicts between administrative levels, so that the legal profession has been involved to a greater extent than in other European countries[3]. The relationship between private and public responsibility for health, and the participatory traditions of different countries, have also been crucial issues in policy development. At one extreme is the US, where public health has been held to be primarily a local and state concern. The strong tradition of voluntary organisations and mutual support groups has been evident in the field of AIDS, as in other areas of health. By contrast, the policies of many European countries have been influenced by the dominant position of the state in health and social welfare. Voluntary organisations have had a role in policy in eg the UK, Switzerland, or the Netherlands, but little influence in eg France or Italy, and none, until very recently, in Eastern Europe[4].

Given the variety of these background variables, together with differences in the magnitude and nature of each country's epidemic, overall 'success' or 'failure' of policy can barely be judged, much less accounted for. Success may, however, be judged not only in terms of containment of the epidemic but also by whether policies have managed to avoid extreme public disquiet, controversy and conflict. It has to be added that there is no evidence anywhere that once a particular epidemic has reached take-off point it can be stopped by any policy – only managed, with greater or less harm to national life. All countries must, if they have time, make their greatest efforts towards preventing that point being reached. Where the emphasis must fall varies from country to country, though in many it now seems that IV drug use is the critical issue.

Countries have achieved both containment and social management in different ways. Sweden or the Netherlands, for instance, demonstrate many features of social life which might have fostered a greater escalation of infection than has in fact occurred. Sweden has achieved this by a quite strong programme of control measures, allied to a consensual emphasis on individual responsibility; the Netherlands by a much 'softer' programme concentrating on education and the involvement of communities. Australia appears to be containing its epidemic by a judicious mixture of both approaches. Similarly, where either of the criteria for 'success' has not been met, the reasons differ from country to country. Although in the forefront of the scientific study of AIDS, France has more cases than any other European country. A delay in the formulation of any effective policies has been attributed to the weak position of public health. Similarly, an attempt to 'normalise' the problem in the UK, to define it as just another chronic disease and primarily a professional problem to be left to experts in clinical medicine, has not fostered clear policies. The example of New York, which at one stage contained nearly half of the US cases of AIDS, demonstrates the intersection of the epidemic with a multitude of complicating factors. Certainly in the earlier years, it appears that an effective local response was prevented by a lack of coopera-

tion between state and federal agencies, the divisive nature of the attitudes to the disease, a city government and a public hospital system already overwhelmed, and high levels of housing problems, unemployment and poverty[5,6].

Despite these different reasons for success or failure, there are some lessons which can be learned in each of the specific policy areas which have been discussed. An attempt will be made to summarise these.

A first and most obvious point is that in much of Africa, South and Central America, and Asia, there is an urgent need for primary preventive measures such as the provision of facilities for HIV testing, blood screening, supplies of condoms, surgical gloves and syringes, and the treatment of STDs. In several countries transfusion blood is still not screened, or only in the principal centres of population. There is much evidence that commercially obtained blood is the most dangerous, and in some countries, even if the selling of blood is now banned, it is not possible to control all commercial blood banks. Until a major international effort is made to correct these things, all other control measures are in vain: spread of infection through medical sources – though slow, of itself – is inevitable.

Mandatory controls and screening

The very strictest controls, which some countries have applied, may slow the invasion of the epidemic, but there is no evidence that they can ever protect against it completely. There are particular problems about applying severe legal sanctions, such as making transmission of the virus a criminal offence, or trying to regulate the sexual behaviour of those known to be HIV-positive. Sexual behaviour is essentially private behaviour, and it can rarely be proved beyond doubt that a particular individual transferred the virus to another. New legal sanctions against particular groups (drug users, homosexual men), or the strict enforcement of existing laws, clearly tend to drive the individuals concerned underground, so that the spread of infection cannot even be monitored. There is little evidence that 'border controls' can ever be wholly effective, and a recent study modelling the effects of travel restrictions concluded that they would have a very small effect[7]. There is little point in testing only certain categories of foreign entrants, and not, for instance, business travellers, tourists, and returning nationals: moreover, in view of the 'window period' when testing may be ineffective, testing should really be repeated if it is to be efficient. As early as 1987 the EC Council of Health Ministers noted '... the inefficiency as a means of prevention of any recourse to a policy of systematic and compulsory screening, in particular in health controls at frontiers'.

Similarly, mandatory and universal HIV testing has nowhere proved to be practicable and efficient. One problem is that regularly repeated tests are necessary. Mandatory testing of 'risk groups' – drug users, prostitutes – has also proved ineffective. Evidence has been provided from (West) Germany, where it has been reported that in Bavaria, where homosexual men and IV drug users have been compulsorily tested, these groups have avoided contact with services, in contrast to Munich, with no compulsory testing. 'Risk group' screening is markedly discriminatory, raises great problems concerning confidentiality and anonymity, and may be strongly resented by those concerned on the grounds that membership of a particular group does not necessarily imply risky behaviour.

The automatic screening of some other target groups – pregnant women and the new-born, blood donors, patients in hospital or attending STD clinics, and perhaps prisoners – has produced less conflict. In most of these cases blood samples are being obtained in any case, and there is little evidence, in the varied countries where such screening is chosen policy, of great public concern about it. The difference from the universal or 'risk group' approach is that the screening gives rise, in each case, to specific action with clear importance for public health. Screening in prisons (where the consequences of being labelled as HIV-positive may be particularly damaging) and of hospital patients (where the object may be essentially the protection of staff) are probably the least well justified.

Epidemiological and voluntary testing

'Sentinel' testing, with the main objective of tracing the development of the epidemic rather than identifying individual infected people, may be conducted among groups thought to have a high prevalence (eg attenders at STD clinics) or low (eg attenders at antenatal clinics). The efficiency of any such testing for epidemiological purposes has been questioned, since it is very difficult to extrapolate from such groups to the general population. However, it can be argued that public health authorities do have a duty to employ whatever means available, however imperfect, to provide information for their populations.

Programmes of surveillance have not been controversial in the case of other diseases, and it is again indicative of the heightened political and ethical sensitivity attaching to AIDS that they have caused problems in so many countries. Dispute has arisen about the absolute necessity for consent, and about anonymity. A number of studies (in, for instance, Wisconsin and Oregan in the US, and New South Wales in Australia) has investigated the impact of anonymous versus named testing, and it has been demonstrated that those at the greatest risk avoid voluntary testing if it is not anonymous, and especially if they know that authorities will be notified of positive results. In 1988 the imposition of mandatory test result reporting in S Carolina caused a 43 per cent decline in voluntary testing amongst those at risk, with obvious consequences for epidemiological surveillance. On the other hand, the identification of the existence of disease without the opportunity to inform and counsel those affected offends the ethical principles of many clinicians. It is argued that preventive policies require that people who are HIV-positive should be informed, so that they may be advised about their behaviour. Again, the development of therapies adds weight to these arguments.

In general, there is a policy consensus that epide-

miology, and the control or treatment of individuals, should be separated, and that there is no ethical objection to wholly anonymised screening. In 1988 the Federal Centre for AIDS in Canada issued recommendations which would appear to remain a model of sensible practice: that sentinel screening should take place, and should be anonymous, but that the public should always be aware that it was being conducted, and should also have good access to voluntary testing, and that special interest groups should be involved in decisions made about the publication of potentially sensitive results. Where controversy remains, it is in those countries with extreme views on the rights of the individual, or in those countries where public health has conspicuously less power than clinical medicine. Again, it must be added that difficulties appear to be felt by the medical profession, or sometimes by special interest groups, rather than by the public themselves: surveys in Western countries commonly find that people are, largely, in favour of testing programmes, even without consent. Public antipathy is certainly not a valid reason for the rejection of anonymous testing. It is, of course, relevant that the majority of any population do not see themselves as at risk.

The encouragement, or not, of widespread HIV testing for individuals who think they may be at risk is another issue on which policies have differed greatly, even in countries which appear to have similar social ideologies. (This of course refers primarily to countries in which public resources are in fact available to test people without symptoms of illness: elsewhere, private testing may exist, but only for those who can afford it). Objections to the encouragement of testing have included the social problems that can arise from knowing that one is HIV-positive, or even from being known to have taken the test, and the emotional impact and stress which may actually be medically harmful. There is no need to know one's HIV status, it is argued, in order to adopt a responsible life style: this is something that everyone should do, not only the seropositive. To know that one is HIV-negative, despite having been at risk, may offer a wholly false sense of security and discourage behavioural change.

These objections are lessening in force now that early treatments are available. A dilemma of the expense of treatment remains, however: if the possibility of identifying every HIV-positive individual is contemplated, then the funds for their treatment will also have to be identified.

The question of whether a positive test result does change people's behaviour is one on which there has perhaps been an inadequate amount of research. There is some evidence, however, that individuals are likely to adopt entirely responsible behaviour. Certainly, the wider acceptance of testing, and the general promulgation of an ethos of responsibility to others, has certain other positive effects. As more people are known to be HIV-positive, and seen to be living 'normal' lives for many years, prejudice and stigma can become less and the whole area of relevant sexual behaviour can become more open to discussion and negotiation.

In most countries, there is little consensus about partner notification or contact tracing, and this is perhaps an area where more public discussion is required. Traditionally, in contact tracing for STDs, contacts are informed of their danger without the identity of the index case being revealed, though of course this is not always practicable. In many countries the medical profession feels great conflict between, on the one hand, their duty to protect the confidence of the individual patient, and on the other, their duty to others who may be put at risk. In some countries even the issue of informing a spouse without consent is seen as problematic.

There is evidence of wide geographical travel of both IV drug users and homosexual men; for instance, about half of the drug users attending a self-referral clinic in Edinburgh, Scotland, for HIV testing had shared needles in altogether 37 different locations in Britain and the European continent[8]. Thus network analysis – tracing out patterns of sexual or needle-sharing contact, even without named contacts – is important to alert both public health interests and population in new areas: despite a few notable studies, little of this is done.

It is difficult, in general, to justify compulsory contact tracing, if only because there is no way of ensuring that index patients will tell the truth. The fostering of a climate of opinion where those who are infected are expected to accept responsibility, and inform others or allow them to be informed, would, however, appear to be a very positive policy.

Intravenous drug use and prostitution

The evidence for the success of 'harm minimisation' programmes in preventing HIV transmission is, as yet, inconclusive. There has been strong support for the efficacy of needle-exchange schemes or the easier provision of equipment in reducing needle-sharing, without increasing drug misuse, in Amsterdam and elsewhere[9,10]. In the UK, some success of the pilot schemes has been claimed in reaching clients with counselling, and reducing numbers of sexual partners, as well as in changing needle-sharing behaviour[11]. There are, however, many different models of needle-exchange schemes. Their success in attracting clients has varied, depending on their location and organisation, and the attitudes of local law-enforcement interests. A general finding is the need to attract women, and the younger and more recent drug abusers. Young people may be protected for a time by sharing only with their peers, but they are likely eventually to integrate with the wider group of users[12].

The place of the liberal provision of oral methadone, to reduce recourse to street drugs and to injecting, in preventing the spread of HIV is also still controversial. There is evidence that many drug misusers continue to inject when receiving methadone, though less frequently.

There is general agreement, however, that if drug misusers are to be reached, street-based, easily accessible, non-punitive facilities are necessary. The compulsory registering or testing of IV drug users has nowhere provided an answer to the problem of HIV

transmission, given the hidden nature of the activity, and many of the 'strongest' policies directed at the abolition of drug misuse have proved counterproductive: users have been further criminalised and turned away from helping agencies.

Active prevention strategies of a wide-ranging nature, including vigorous outreach work, have on the other hand claimed some success: an example is the Mersey Regional Health Authority of the UK, which has the highest population rate of drug addicts in treatment of any part of the UK, but the second lowest rate of HIV infection, with only one new case reported in drug misusers in the two years to July 1990. Of those known to be HIV positive, 53 per cent are IV drug users in Scotland, but only 9 per cent in Mersey. It is commonly noted that outreach work must be supported by clinical and social services. General 'health improvement' campaigns, not dependent on the patient's accepting treatment for his or her addiction, are an important function in addition to the promulgation of 'safer' behaviour. The importance of outreach, community-based projects in reaching the disadvantaged is also stressed[14], together with the importance of peer self-help groups such as the Junkiebonden in the Netherlands or ADAPT in the United States. The problems of HIV spread among drug misusers are not solved simply by the prevention of the sharing of needles. There is a great need for counselling and education about change in sexual behaviour, in view of the widespread evidence that even among those drug misusers who have been persuaded to change their needle-sharing habits, there is much less acceptance of the need for safe sexual behaviour.

The sexual contacts of drug misusers are an obvious source of spread of infection through the population. This, together with their escalating rates of infection in many Western countries, makes policies towards drug misusers a crucial issue. The problems of opposing ideologies – harm minimisation versus a commitment to abolition – are not likey to be easily solved, though these need not be seen as mutually exclusive. Certainly, the most important lesson seems to be that these conflicts must be resolved, and practical policies instituted, before the spread of infection reaches a stage where it appears out of control. Not only are drug-using patterns very localised, but it seems that there are areas where HIV has not yet been introduced, irrespective of patterns of needle-sharing. Comparisons can be made between New York and Florida in the US, and between Edinburgh and Glasgow in the UK. In some areas, where prevalence of HIV infection among drug users is fairly low, and policies initiated quickly, it seems that the epidemic is being controlled: in others, where rates are very high and a response dilatory, policy may approach a state of helplessness.

A degree of hypocrisy appertains to the policies regarding prostitution which many countries have chosen to adopt. The overlap between drugs and prostitution is, of course, a cause of concern. Apart from this, however, there is a lack of evidence in the West implicating women sex workers in the transmission of infection. Nevertheless, AIDS has brought the perception of prostitution as a 'problem' to the surface in many areas. This is not only true in Western countries: in Thailand, for instance, there has been less concern about infection among drug misusers, though surveys have shown much higher rates of seropositivity among this very large group, than about rates – admittedly quite high – among sex industry workers. The latter are, perhaps, seen as more likely to transmit the virus to other sections of society, and to affect the tourist industry.

Responses have included, firstly, suppression, ie the attempt to prohibit commercial sex, as in many states of the US, or countries of eastern Europe, and regulation, by testing, licensing and registration. Suppression has, clearly, never proved successful. Regulation always appears to be accompanied by an 'unofficial' trade, and unless testing is very frequent licensing may foster complacency about risks and discourage general condom use.

The clients of prostitutes far outnumber the prostitutes themselves, of course, though they receive little specific attention, whether in developed or developing countries. Clients are frequently shown to be married men or to have other sexual partners, and both clients and – in some areas – prostitutes are especially geographically mobile: both factors have implications for the spread of HIV infection. A substantial proportion of clients are known to be willing to pay for higher-risk forms of sex.

As with IV drug users, outreach programmes, personal contact, and easy contact with health services are required. Such interventions have claimed to be successful in promoting 'safe' behaviour in areas as far apart as Greece[15] and Kenya[16]. Specific policies designed to foster condom use – whether free supplies, as in Liverpool or Amsterdam, or simply ensuring easy availability – have been effective. Self-help groups and organisations have proved important.

Male prostitutes, though likely to be at greater risk, have been curiously 'invisible' in both policy and research. This may be because the topic of male prostitution is confused by attitudes to homosexuality, whether these are discriminatory or liberal.

In general, it would seem that the subject of prostitution is most usefully subsumed under general issues of the promotion of 'safe' sexual behaviour. The problem of prostitution itself, especially in those countries (many African countries, some Asian, Pacific and Central American countries) where rates of infection are high, is more properly a problem of poverty, social structures and the position of women.

Public education

Public information and education directed towards changes in sexual behaviour are a crucial part of the policy of almost every country. In less developed countries, facing the greatest difficulties, they may be the only real policy option available. The consensus, from both developed and developing nations, is that national campaigns can be very effective in giving populations the basic facts about AIDS.

Everywhere, however, AIDS presents problems which are more severe than those of conventional 'health education' programmes. There is no doubt that changes in patterns of sexual behaviour could slow the epidemic: there is some tendency, however, to exaggerate the effect that will be possible. It has to be acknowledged that a world-wide revolution in sexual behaviour is most unlikely to be achieved in the short term by means of media or similar campaigns.

Properly conducted, they can inform, and they can change the general climate of opinion gradually and in relatively minor ways. Messages of compassion and anti-discrimination are perhaps of equal importance to messages of self-protection, if the problems of HIV/AIDS are to be faced in a constructive way. The major lessons of educational experience throughout the world are, firstly, that peer-group education, coming from those who are trusted and who know best how to reach specific audiences, is very much more effective than messages from 'authority': on such an intimate topic, education needs to be interactive, not simply one-way communication. Secondly, the realities of human behaviour have to be faced: modification of existing lifestyles may be possible where a complete change is unlikely. Peer-group campaigns have had some partial success precisely because they have tended to offer positive rather than negative messages, accepting current behavioural practices without moral judgements but offering choices of ways in which they can be adapted. Thirdly, it is clear that risk takes so many different forms among different groups that 'all-purpose' campaigns are likely to be seen as irrelevant by the majority. Fourthly, education should not focus narrowly on AIDS as a single issue. For individuals, it is not experienced as a problem in isolation, but as something which may affect the whole of their sexual, family, and social lives. Lastly, the theme of self-responsibility – 'it is my duty not to run the risk of infecting others' – is probably a more effective one than the theme of self-protection – 'it is my duty not to become infected'. Only a very few countries have, however, chosen to stress it.

It may be added that the education of women is a special issue, of great importance in Pattern II countries, and increasingly relevant in others. In many areas, a traditional lack of status, economic or social dependence, confinement in the home, and poorer education, may all heighten women's vulnerability and mean that public education does not reach them. Even in developed countries, poverty, urbanisation, and sexual activity at an early age represent risk, and young women may be ill equipped to negotiate their sexual activities. The empowering of young women to take some control of their relationships is a special educational task of crucial importance.

To offer public education programmes is one of the 'easier' policy measures that governments can take, as a demonstration that 'something is being done'. The major lesson to be learnt from experience, however, is the uselessness of focussing on individual behaviour change, rather than tackling the social factors which shape behaviour.

Policy regarding drugs and vaccines

There are many policy problems related to potential treatments for HIV and AIDS which, as yet, have barely been faced: just as the pharmaceutical industry is essentially international, so these problems appear to require international solutions. Particularly in the US, the advent of possible effective treatments has already forced a reconsideration of the regulations regarding research and the role of the classical method of 'random controlled trials'. It is argued that in the case of such a disease as this, it may be immoral to deprive patients of a treatment which may be of benefit: as soon as a drug has shown some probable efficacy, 'therapy versus placebo' trials should be interrupted and the drug distributed. Medical interests, on the other hand, may suggest that open access to drugs precludes their proper assessment and weakens the commitment to clinical trials. In the event, pressure from activists resulted in an open-access system in late 1988 in the US, allowing the compassionate use of drugs though controlled trials were not yet complete. Trials have since been subverted by the sheer weight of numbers of people coming forward for free distribution. In Britain and France, trials of the drug ddI have been radically redesigned to allow participants to choose to receive the drug.

A movement towards patient empowerment, which was already in train, has been facilitated by AIDS. The right of patients to collaborate in the design of drug trials has been claimed, and the choice of subjects for trials criticised. There is a need, it has been suggested, to extend trials to those typically under-represented: women, children, ethnic communities, and IV drug users. These are more likely to be reached by 'community based clinical trials'.

The costs of providing existing and possible future drugs is inevitably an issue, even in wealthier countries. In the US, emergency federal programmes have been necessary to assist states to pay for zidovudine for those without insurance, and to make adjustments to Medicaid. Many of those with HIV infection in developed countries are not covered by insurance and live in cities whose local services cannot bear the cost. A crisis situation exists, particularly, in New York. The problems of identifying the funds for providing such drugs to possibly hundreds of thousands of infected people are equally severe in countries with publicly-funded health services, and in developing countries, the cost of drugs may totally prohibit their general use.

The problems of a possible vaccine are perhaps even more severe. There is optimism that a vaccine will be found by the late 1990s, though the complex nature of the virus makes it a difficult task. Many strains of HIV exist and even in one person the virus can undergo rapid mutations. Nor is it possible – as it was, for instance, with polio – to study the nature of the immune response in those who have recovered without treatment. In particular, some strains found in Africa are different from those on which most Western vaccine development is based.

Several candidate vaccines are in early stages of testing. Evaluating their efficacy on a larger scale,

however, will raise new questions. Trials will not be efficient if conducted in low-prevalence populations, but among high-prevalence groups, in particular, it would be unethical not to urge people at the same time to reduce their risks by behaviour change. Even when tested and approved, problems of distribution remain. Who is to be vaccinated? Since vaccination cannot be without risk, however small, can it ever be compulsory?

In developing countries with high prevalences of AIDS the same problems of cost attach to vaccines as to drugs. There are already suspicions if populations seem to be used as 'easy subjects' for research, without permanent benefit. Several suggestions have been made: one, that the developer of a vaccine should transfer the patent rights to the WHO or some other international consortium, who could distribute it at production cost, and in return the company could gain the prolongation of the patent of some less immediately lifesaving, but profitable, drug. Alternatively, a two-tiered pricing structure could be envisaged.

These are all problems of international, rather than national policy. They require urgent discussion.

Conclusion

Like the search for a cure, the tasks of prevention and management of AIDS are not solely technical and scientific issues: this monograph has shown that they are shaped by social factors and by the agendas of those who set priorities and control resources. Policy is the outcome of conflicting interests, always in the context of each country's cultural legacy and position in the world. The epidemic intersects with concurrent crises and social movements – changing patterns of sexual mores throughout most of the world, the universal problems of urbanisation, the economic instabilities and forced migrations of developing countries: all these have set the stage. Our understanding of the determinants of policy is limited, but ideally the growing knowledge of the science of the disease needs to be matched by as detailed and sophisticated an understanding of the social, political and economic issues involved.

Similarly, international collaboration in science should be matched by international policies for management and prevention. This is necessary not only because of the movement of peoples (and illegal drugs) across frontiers, but also because there must be common concern for the social stability of other countries. The very different patterns which the epidemic has followed, and conflicting national interests, have sometimes prevented an international view. In many Western countries, there has been an attempt to normalise the issues involved by subsuming them within 'ordinary' medical practices. This traditionally individualised view of health has nowhere proved unproblematic, however. In the face of this new challenge, health can alternatively be conceptualised as a resource held in common, threatened worldwide, and requiring nations in all humility to learn from each other.

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