

# **HIV/AIDS and Development: Case Studies and a Conceptual Framework<sup>1</sup>**

**Tony Barnett**

School of Development Studies,  
University of East Anglia, Norwich NR4 7TJ, UK  
email: a.barnett@uea.ac.uk

and

**Alan Whiteside**

Health Economics and HIV/AIDS Research Division,  
University of Natal Durban 4041, South Africa  
email: whitesid@eru.und.ac.za

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## **Abstract**

This paper presents outline accounts of some social and economic features of the HIV/AIDS epidemics in five countries: the United Kingdom, Botswana, Uganda, India and Ukraine. It suggests that:

- (a) certain key features of society and economy are major determinants of the degree to which epidemics become generalised to whole populations;
- (b) these features can be conceptualised in ways that will assist in more effective targeting of preventive interventions and measures to confront the medium- and long-term impacts of raised morbidity and mortality associated with the occurrence of generalised HIV/AIDS epidemics.

**Key words:** HIV/AIDS Impact Susceptibility Vulnerability Socio-economic Development.

## **Introduction: Transmission, Intervention and Impact**

The HIV/AIDS epidemic has already reversed many of the development gains made in Central, Eastern and Southern Africa over the past three decades as measured by the Human Development Index [United Nations Development Programme, 1997] and by Child Mortality Rates [Stanecki and Way, 1999: 60]. HIV/AIDS is a major problem for development and must be taken into consideration by anybody working in this field. The shape and form of an epidemic reflect the economic, political and cultural characteristics of any society. If the causes and consequences of the epidemic are to be addressed, a new conceptual framework is required.

Most HIV infections are sexually transmitted. Globally, most of these are heterosexual transmissions. Sexual transmission occurs in a complex framework that determines the gradient and final peak of the epidemic curve. Factors affecting epidemic trajectory may be divided into the most general and the more particular. Some are illustrated in Figure 1. Most interventions have been and are focused on behavioural and bio-medical variables. This article refocuses attention on less proximate factors that are of particular importance when the social and economic causation and medium- to long-term impacts associated with HIV are considered.

HIV is unique because of the nature of transmission, the poor prognosis for those infected and the long latent period between infection and illness. This last feature means two epidemics must be considered: an epidemic of HIV infection followed by an epidemic of AIDS-related illness and subsequent death<sup>1</sup>. The advantage of this perspective is that it captures:

- (a) the "long wave" nature of the event - the curve of epidemic infection spanning many decades;
- (b) the fact that the impact of increased morbidity and mortality will be felt by individuals and entire societies over several decades.

The distinction between the two epidemics is illustrated in Figure 2, which shows the past, present and projected situation in South Africa.<sup>2</sup>

One key issue is whether the epidemic is generalised or localised. Generalised epidemics, where prevalence is high in the entire sexually active age cohorts, are found in many African countries and parts of Asia<sup>3</sup>. Localised epidemics, where high prevalence is restricted to certain population sub-groups, are found in much of Asia, Latin America, and parts of Africa.

These cautionary observations means that in this paper, as in any other comparative discussion of HIV statistics, the magnitude and the shape of epidemic have to be treated with some care. The point of departure is the view that societies manifest epidemics which reflect their specific economic, social, political and cultural conditions. While this may reflect different periodicities on the road from concentrated to generalised epidemics, it is now also highly likely that we are observing different epidemic patterns in different world regions and in different countries within the same region. This case cannot be argued at length here and is difficult to demonstrate in the absence of directly comparable HIV and AIDS data. However, Figure 3<sup>4</sup> shows a global range of epidemic types.

Good quality data are difficult to obtain in this field. Numbers of people reported as diagnosed with AIDS are subject to many errors and omissions at the levels of whether or not somebody ever visits a medical facility, are diagnosed and that diagnosis is recorded. In the USA it is estimated that 10 per cent of AIDS cases are not reported, in the developing world probably fewer than 10 per cent of cases are recorded.

With regard to HIV figures, until recently HIV testing required drawing blood, only obtainable through an invasive procedure. To gain some idea of the prevalence levels in the general population, the best, and often only, data of this kind came from women attending ante-natal clinics. Here blood is taken for other tests and typically a small portion would be sent for testing.<sup>5</sup> How far such data are representative of the general adult population will vary according to a number of circumstances and conditions. However, in the absence of a population based serosurvey, such data are usually the best available.

In this paper, data from the UK, Botswana and Uganda are largely derived from ante-natal clinic attenders unless otherwise stated. In contrast, the Indian data were collected on an ad hoc basis and must be treated with caution, but are all that was available. In Ukraine blanket testing was implemented until 1994: all ante-natal clinic attenders were tested as were any persons whom the medical, public health and social services considered be in a “risk category”. This resulted in tens of millions of tests being done, some more than once on the same person.

### **The Context: Prevention and Impact Mitigation**

The context of this paper is the literature on epidemic impact which can be summarised as follows.

**Demographic Impact:** these debates go back to the earliest period of the epidemic and include work by Bongaarts 1988, Anderson et al. 1988, Stanecki and Way 1998, and others. The current state of knowledge in this area is elegantly summarised by Stover [Stover,1998, 11-31].

**Macro-Economic Impact:** these analyses modelled the impact of the epidemic using conventional economic approaches. Ainsworth and Over’s [Ainsworth and Over, 1992] is one example while those of Cuddington and others [Cuddington, 1993 ; Cuddington et al.,1994] represent more sophisticated attempts. Forsythe and Rau [Forsythe and Rau, 1996] looked at the problem in a broader perspective while Rowley and Anderson [Rowley et al., 1990] and [Anderson et al., 1991] considered it in specific relation to the epidemiological and demographic dynamics.

**Health Sector Impact:** Floyd and Gilks [Floyd and Gilks, 1996] examined the impact of HIV/AIDS on the provision of medical care in Kenya, while Forster [Forster, 1996] looked at the impact on health care facilities in one district in Zambia. Attempts at impact analysis using the burden of illness approach and the concept of DALYS include the following Williams, 1998; Ojo and Delaney, 1997; Quinn 1996; Shepard 1998; Tiekoura, Silue, Agness-Soumaharo et al 1998; Izazola, Saavedra, Prottas and Shephard 1998; Iunes, Campino, Prottas and Shephard ,1998; Tibandebage, Wangwe, Mujinja et al 1998; Kongsin, Cameron, Suebsaeng and Shephard, 1998.

**Household Impact:** there have been a limited number of studies, notably the following: Barnett and Blaikie, 1990; Barnett and Blaikie, 1992; Barnett, 1993; Barnett, 1994; Konde-Lule, Ssegonzi, Wawer et al. 1993. Among the most detailed analyses have been those of Menon, Wawer, Konde-Lule et al. 1998. Data collected by Ainsworth and Over and others as part of the “Kagera Study” remain largely unanalysed apart from some partial discussion in World Bank, 1997. A very recent report by Williams [Williams 1999] provides useful and novel material about how the elderly cope in Buganda when their adult children have died.

All of the above have used the standard approaches and techniques of the disciplines. With the exception of the development of some innovations in mathematical modelling of epidemics and of population changes (discussed at length in Anderson and May, 1992), in the use of “participatory rural appraisal” methods in

social analysis as employed by Williams [Williams 1999], and in the linking of social, economic and agricultural issues [Barnett and Blaikie, 1990, 1991; Barnett, 1994], there has been little or no technical or conceptual innovation in approaching these issues. Alban, 1998 discusses approaches to prevention and impact mitigation theory and provides a useful overview of much of the economic literature in this field including the approach adopted by the present authors.

### **Socio-economic and Macro-level Interventions**

Interventions at the bio-medical and behavioural level are vital, but there is little in the armoury<sup>6</sup>. Experience from gay male communities in the USA and Western Europe, and heterosexual communities in Uganda, suggests widespread behaviour change occurs in response to large increases in mortality, at which point the HIV epidemic may be nearing its peak..

This paper argues that societies facing generalised epidemics, or where the epidemic is already generalised, should contemplate interventions that do not usually receive sufficient consideration. These are at the social, cultural and economic levels (described as macro and socio-economic in Figure 1). They should target (a) population sub-groups that are driving the epidemic and (b) population sub-groups most likely to be adversely affected by excess mortality and morbidity.

In the first case, interventions will confront social and economic factors increasing *susceptibility* to infection; in the latter they will engage with the impact of death and illness, and how some population groups are particularly hard hit by these because they are especially *vulnerable* to impact. Such interventions are complex and closely connected to wider issues of social and economic welfare policy. This has recently been recognised by The World Bank, which argues that interventions must be both cost-effective and also efficient insofar as they are targeted at specific population sub-groups. Here we outline a framework for targeting both prevention and mitigation interventions, taking into account social and economic processes. Three concepts are important in developing the framework, namely *risk environment*, *susceptibility* and *vulnerability*.

### **Risk Environment<sup>7</sup>**

In epidemiology, the concept of "risk" is used in a strictly statistical sense. Thus:

"the degree of increased risk associated with a specific behaviour or other factor is measured as the relative risk or relative odds of infection comparing those with the factor to those without the factor." [Brookmeyer and Gail, 1994:23]

This can be expressed mathematically and produces the concept of a "risk group", which refers to all those individuals belonging to the set with the characteristic that is shown from cohort or case control data to be associated with increased relative risk or relative odds.

In the case of human disease, especially fatal sexually transmitted infections, the precise statistical concept of a risk group used in specialised technical discussions within professional groups is easily translated into another, less precise use of the same term. When this happens, "risk" is no longer the observed characteristic which raises the odds of being infected but rather the "risk" which "they" (those who possess that observed characteristic but may not be infected) pose to "us" the uninfected. This has particularly occurred in relation to HIV/AIDS. Thus specialised and precise epidemiological language is translated into everyday and less precise language, becoming connected to ideas and emotions such as those of blame and stigmatisation.

The implications of this are that sexual intercourse (of whatever variety) is not intrinsically a "risky" (in the popular sense) behaviour beyond the obvious risks of conception. However, when a deadly disease

appears **and** the social and economic environment is such as to facilitate rapid and/or frequent partner change, then that environment may be described as a *risk environment* and the act of sexual intercourse becomes a *risk behaviour*. A risk environment is one in which the chances of disease transmission are increased as a result of social, economic and cultural factors. Features of risk environments will be explored in the case studies below.

### **Susceptibility**

In a risk environment, individual, group and general social predisposition to virus transmission is increased. This is described as *susceptibility*. Susceptibility is defined as those factors determining the rate at which the epidemic is propagated. It may be considered in part to describe the "riskiness" of the environment as that term was defined above. Such factors may be infrastructural (the development of a road), environmental (a drought resulting in unusual population movements), cultural (a particular sexual practice or belief, or a change in these), economic (increased unequal distribution of income), or social (the operation of labour and associated housing markets in urban areas). This concept may be operationalised at any level, from an entire "society" or country, down to a household. It may also be applied at the level of socio-economic entities - such as an organisation or manufacturing enterprise. The relations between factors and the range of factors determining relative susceptibility have been outlined in Figure 1. However, for more detailed discussion, reference may be made to Carael, Buve and Awusabo-Asare [Carael et al., 1997: 21-31] and Ainsworth, Fransen and Over [Ainsworth et al., 1998]. Earlier discussion of these issues is to be found in Mann and Tarantola [Mann and Tarantola, 1996]. The concepts of susceptibility and vulnerability are explicitly discussed in Barnett and Grellier [Barnett and Grellier, 1996: 444-446].

### **Vulnerability**

This describes those features of a social or economic entity making it more or less likely that excess morbidity and mortality associated with disease will have deleterious impacts upon that unit. Once again, this concept may be applied at a number of levels. For example, a household with only one wage-earner who is aged 25 is more vulnerable than one in which there are two or more wage earners, one of whom is more than 50 years old. A farming system in a dry region, with rainfall limited to six weeks of the year, is one in which any shortage of labour for key cultivation activities will result in restrictions of production for the entire season. An industrial process plant that depends upon one or two key pieces of equipment with very specialised operators in short supply, is more vulnerable than one where large numbers of unskilled workers are involved in the same or similar processes.

### **Relative Susceptibility and Vulnerability**

It is possible to speak of *relative* vulnerability and susceptibility in relation to the different levels of unit with which we are concerned. *Relative susceptibility* will affect the gradient and the final peak of the epidemic, while *relative vulnerability* will describe the social and economic effects of impact over time. The values of some of these levels of susceptibility and vulnerability could be expressed in quantitative terms (e.g. rates of rural-urban migration - which may be an important factor in relative susceptibility) or in qualitative terms (such as the enhanced rates of infection associated with particular balances of power between men and women and the ways these affect sexual partner choice or lack of choice).

In the next two sections five brief case studies are presented and discussed in terms of these three analytical concepts. The concluding section explores ways in which the notions of susceptibility and vulnerability may be further refined to enhance programme and policy targeting.

## Case Studies I: The Shape of the HIV/AIDS Epidemic

Here we describe briefly the different shape of five epidemics. This discussion is presented against a clear understanding that where national epidemics are described they are composed of a number of sub-epidemics, and that it is only when these come together that a "national" epidemic may be said to exist. We also recognise that the national epidemic is the construct of a particular reporting system embedded in a specific polity. In the second sub-section we discuss the ways in which these could be said to reflect differential susceptibility.

### United Kingdom

The epidemic in the UK (with a population of approximately 58 million) is comparatively small. The first AIDS cases were diagnosed in the early 1980s and by 1983 totalled 51<sup>8</sup>. By 1997, 14 431 people were diagnosed as having progressed to AIDS, of whom 10 500 had died. Of diagnosed AIDS cases, 69 per cent were men who have sex with men. The next largest group of AIDS cases (12 per cent) consists of people from abroad and people from the UK who have lived or visited abroad. The third largest group is injecting drug users (six per cent). Over the same period, a total of 29,599 people had tested HIV+. Of these, 59 per cent were men who had sex with men, 15 per cent were people from or having lived abroad, and 10 per cent were IVDUs. The data source in the UK for AIDS cases is voluntary reporting of cases by medical practitioners. It is believed that a very high percentage of actual cases is identified and this is assisted by the ability of the medical services to offer care. HIV data come from a variety of sources, including STD clinics. However, for the comparative purposes of this article the data used are the unlinked anonymous HIV surveys of pregnant women.

The total number of people infected has increased slowly but steadily, but the proportions in each of the infection categories have altered, as shown in Table 1, which compares probable means of infection in 1986 and 1996 for AIDS and HIV respectively. Thus the shape of the UK's epidemic may be described as initially concentrated among men who have sex with men, with smaller heterosexual and IVDU incidence. In the early years, the men to men statistics were probably associated with the gay politics of the late 1970s and early 1980s, where male to male sexual expression took on a political complexion. The result appears to have been a high rate of partner change and sexual experimentation, although in the UK this did not often take the more florid form evident during the same period in the United States [Shilts, 1987].

The gay male community responded quickly to the problem, and the number of new infections has stabilised in the range of 1,000-1,600 per year since 1986. The IVDU situation has been contained by interventions such as needle exchange schemes and education of intravenous drug users about the dangers of infection and how to clean equipment. The male-female incidence has consisted predominantly of people who appear to have contracted HIV abroad<sup>9</sup>; the largest category is people who contracted the infection in Africa.

### Botswana

Botswana has a population of 1 330 000 (1991) and one of the fastest-growing economies in the world. It is in the UN's upper-middle-income category. Botswana has also done well in terms of human development. Life expectancy was 60.3 years; infant mortality 61 per 1 000 live births; the adult literacy rate is 75 per cent; and 96 per cent of primary school-age children are in school. The country has a well

developed, decentralised, primary health care system.

The first AIDS case was recorded in Botswana in 1985. Up to the end of 1997 nearly 6 500 cumulative cases had been recorded. The Ministry of Health estimates that 70 per cent of cases are unreported. There is no requirement to report AIDS cases, thus these figures rely on voluntary reporting by clinicians.

The AIDS/STD Unit has carried out regular HIV sentinel surveillance surveys in Botswana. These are done in a number of urban, peri-urban and rural locations each year. They are among the best-designed and executed in Africa, and give a clear picture of the status and trends of the epidemic. Botswana has a good public health system, and it is believed that coverage is high. The results for ante-natal clinic attenders in the two major towns are shown in Table 2. There is no national HIV seroprevalence estimate, although data are available for a range of urban and rural areas and also show similar upward trends.

## **Uganda**

The first documented cases of AIDS were identified in Rakai District of south west Uganda in 1982. By 1988 clinically defined cases were seen from most parts of the country. Infection was concentrated in the “sexually active” age groups between 15 and 50. By the early to mid-1990s the female rates exceeded those of men, particularly in the younger age cohorts. There is no requirement to report AIDS cases, thus the cumulative figure of 51 344 cases reported by 1996 does not reflect a true picture of the burden of illness and death. HIV surveillance is carried out using sentinel surveillance of ante-natal clinic attenders at public health facilities described earlier. The figures in Table 3 [Kayita and Kykalunga, 1997] illustrate HIV prevalence in one of the more seriously affected districts.

The main distinctions in the early period of the epidemic were between urban and rural rates, the former being lower than the latter, and between districts, with those in the south of the country apparently showing higher rates of infection and more frequent clinical presentation than the north. There were also some indications that the epidemic might be concentrated among the very poor and the very wealthy. In 1988 a sample sero-survey was undertaken of all parts of the country that could be reached in the then-prevailing security situation (effectively excluding some northern areas). This showed the epidemic had become generalised and in excess of one million Ugandans were likely to be HIV+. As of 1997 it was apparent that as many as 1.5 million people might have been infected [Kayita and Kykalunga, 1997]. Some areas and age cohorts exhibited rates of infection as high as 35 per cent. There are indications that the prevalence rate may have stabilised in some areas and the incidence rate could even be showing some signs of decline.

The “shape” of the epidemic may be summarised as radiating from specific centres (Kampala, Rakai District and the main communications routes from the African east coast to the centre of the continent) along communication routes into the general population. The main mode of transmission was heterosexual intercourse. The result is a generalised epidemic of HIV/AIDS, with adult prevalence likely to remain at around 12 per cent for at least the next five years [Kayita and Kykalunga, 1997].

## **India<sup>10</sup>**

Given the size of India, with a population of close to 1 billion, aggregate national data will be presented but case studies concern only two states, Rajasthan in the west and Manipur in the east.

The first case of AIDS in India was registered in 1986. Since then, HIV-positive people have been reported from all the states of the country except Arunchal Pradesh. Slightly over three million tests among government-defined “high risk” groups had identified 56 409 people as HIV+ and as of 1997 there had

been a cumulative total of 5 002 people who had been diagnosed as having AIDS. These data are reported voluntarily by clinicians, and given the stigma attached to AIDS, greatly under-represent the situation. The rate of HIV prevalence has increased annually, as shown in Table 4. Most recent estimates indicate that more than ten million people are probably infected with HIV (Personal communication, March 1999).

The data from India are the most problematic in providing a picture of the epidemic. The National AIDS Control Organisation (NACO) reported all tests carried out, no matter why they were done. These included testing for clinical reasons, at blood banks, serosurveys, and tests ordered by the authorities. There may have been double counting of HIV-positive people who were tested more than once and/or in different localities. The situation improved when, as this article was being finalised, NACO began a system of standard ante-natal clinic attender surveys. However, several years' worth of results will be required before a clear picture of the epidemic in India is available.

The highest number of HIV infections has been reported in Maharashtra and Manipur<sup>11</sup>. The evidence is that the first epidemic is concentrated among women commercial sex-workers and their clients in the urban centres; the second among men who have sex with men. The third epidemic is located among IVDUs, mainly in the north-east of the country. There is also an epidemic stemming from the use of infected blood and blood products. This is illustrated in the breakdown of infections by known or assumed rates of infections, as shown in Table 5 [Government of India, 1997: 2].

This is not as yet a generalised epidemic. It appears to be socially and geographically limited to certain groups and areas, although this may also reflect the way that the data are collected.

## **Ukraine**<sup>12</sup>

The epidemic in Ukraine is very recent. Up to the end of 1996 a total of only 228 AIDS cases had been reported, in a population of about 51 million. There are problems of data quality. These include the lag in reporting and recording cases which have to be identified at one of the three specialised HIV clinical centres that can diagnose AIDS, and the general difficulties facing all sectors of the health service. The lack of treatment options for those with HIV affects their willingness to come forward. However, AIDS cases were, and remain, notifiable.

Between 1987 and 1994 there was extensive HIV testing. Over 39 million tests were carried out, and only 398 people were positive, of whom 215 were foreigners. Under the Soviet system, HIV testing was done for virtually any reason. All ante-natal clinic attenders were tested for each pregnancy. Foreigners were required to take tests, as were Soviet citizens moving to or returning from abroad. The authorities could require commercial sex workers and IVDUs to be tested. The result was that vast numbers of tests were carried out at considerable cost to locate very few infections<sup>13</sup>.

Since then the picture has changed dramatically, with a rapid rise in the number of positive test results, although the pattern of surveillance has also changed. There is no longer blanket testing, nor is there systematic collection of HIV data through sentinel surveillance. Although it is accepted that HIV-positive results have risen exponentially, there is a debate about the true number of HIV-positive people. Since 1994 the data show 25 000 tests have been positive, but only about 12 000 have been officially registered. Estimates of HIV infections range between 60 000 and 180 000.

What is clear is that up to 1994 Ukraine was not experiencing an HIV epidemic. There were sporadic positive tests, and the majority associated with foreigners. Since 1994 an HIV epidemic has become

apparent and the data show that it is primarily located among intravenous drug users (IVDUs) (see Figure 4), although there is some, mainly anecdotal, evidence of a small sub-epidemic among homosexual men. There is little information on the spread into the broader population, although early indicators shown an increase among ante-natal clinic attenders. What is critical is to identify the "bridge" populations who may carry the disease from the IVDUs into the general population.

Despite data gaps, the future of the epidemic was modelled and the results are shown in Table 6 for two scenarios<sup>14</sup>. The first assumes that the HIV epidemic would follow a pattern similar to that in parts of western Europe: the epidemic spreading primarily in a population sub-group, with little significant spread to the general population. The second assumes rapid and generalised spread of HIV. Although the future course of the HIV epidemic may vary, there will be a rise in the number of AIDS cases due to the current increase in HIV infections.

## **Case Studies II: Risk Environments, Susceptibility and Vulnerability**

In this section we explore the ways in which the different patterns and shapes of these five epidemics may be related to processes at work in each of the societies.

### **The United Kingdom**

The general health status of the UK population was high in the late 1970s and early 1980s, despite clear gradients in the distribution of health and illness on lines of socio-economic class. Although the National Health Service was under financial pressure, and the entire society was undergoing a radical process of economic and social restructuring, surveillance and treatment of sexually transmitted infections remained effective.

Among the gay male community, a predominantly young group of men possibly with higher than average levels of disposable income, there was growing consciousness and action associated with the politicisation of questions of sexual choice and orientation. From the early 1970s onwards, increasing wealth, geographical mobility (both national and international), the politicisation of sexuality and the campaign to change the political and cultural position and perceptions of homosexuals resulted in many dramatic changes. Although the UK did not see the development of the "bath house" sexual culture of the US west coast, in the larger conurbations opportunities for rapid sexual partner change and experimentation did occur. Some sexual lifestyles were associated with high risks of contracting the common sexually transmitted diseases. These were treated and, apart from some indications of drug resistant strains, there appears to have been a degree of equilibrium between organisms and hosts. These men's health status was high, and provided a bulwark against the effects of frequent infection.

However an environment had been created where any organism transmitted through sexual intercourse would find many new hosts as the rates, diversity and frequency of sexual mixing increased. Thus it was that economic, cultural and political elements contributed to the development of a "risk environment", where certain behaviours became risk behaviours. It must be emphasised that this occurred among a group of people who, while they had been politically and culturally marginalised, were on the whole materially well off, healthy and educated.

In contrast, the epidemic among drug users who shared injecting equipment was localised in relatively poor and immobile people in a few urban centres, notably Edinburgh and Glasgow in Scotland, and London in England. The heterosexual epidemic appears to be closely associated either with having come to the UK from an area of high HIV prevalence, particularly Africa, or contracting the infection abroad [AIDS/HIV Quarterly Surveillance Tables,1997].

The UK exhibited a low level of general societal susceptibility to disease transmission. STI rates were low and contained by a system of mainly free health care. This was supported by an effective reporting and surveillance system. Increasing income and wealth disparities in the 1980s and early 1990s do not appear to have had any noticeable effect on the diagnosis and treatment of STIs. Widespread and often free availability of condoms kept HIV rates in the heterosexual population low. Female CSWs, a potential bridge population, adopted condom use or other safer sexual practices; had sufficient bargaining power to negotiate the terms of their trade; or were fortunate that their clients were not in the bridges to those who were HIV+. Seroprevalence rates among female sex workers remain at low levels<sup>15</sup>.

Among men who have sex with men there was an effective self-help response to the epidemic. This built on experience in the USA and elsewhere, and also benefited from the pre-existing organisation which had developed around the politicisation of homosexuality. Messages about safer sexual behaviour and the diagnosis and treatment of HIV and AIDS were effectively transmitted and acted on.

Thus we may summarise the situation in the UK as follows. At the bio-medical level the population was not very susceptible, as a result of mainly free and universal medical provision, especially the satisfactory treatment of STIs; there was clear (if some would argue misguided) government response to the need for public education; and condoms were, and are, easily available, either without cost from general practitioners and other health facilities, or at low cost from many retail outlets including dispensing machines. Among the gay male population there was a high level of self-generated response. The IVDU epidemic has been the subject of a number of imaginative needle exchange schemes, funded and organised by central and local government together with the non-government sector. It was among this group, who may fund their drug use by commercial sex work, that an important bridge to the general population might have been expected to develop, but has not.

As a rich country with high levels of education and historically high levels of employment combined with capital intensive industry, the society was never in any sense vulnerable to the impact of the epidemic at these low levels of infection, illness and death. The health care system has coped and, with the exception of some notable deaths in the realm of the arts, economic and social life has not suffered any major impact from the epidemic. We may conclude that at these levels of infection, and indeed at probably rather higher levels, the UK is not and would not be vulnerable to the impact of HIV and AIDS.

## **Botswana**

At independence in 1966, Botswana was one of the poorest countries in the world. In 1997, after more than three decades of sustained economic growth, it was estimated that Botswana has a GNP per capita of US\$3620, the third highest in Africa after Gabon and South Africa. Between 1985 and 1995 the economy grew at 6.1 per cent per annum [World Bank, 1997], and in 1996/97 growth was estimated at 6.9 per cent [Republic of Botswana, 1998].

Although it is a semi-arid country, until very recently the population depended on subsistence agriculture and cattle. Economic growth has led to rapid urbanisation. Of the estimated 1 496 000 population, 729 000 were in urban areas, (48 per cent), up from only 18 per cent in 1981. The population has been growing rapidly, 3.48 per cent per year between 1981-91. Until 1991 employment opportunities increased but growth has slowed: in 1997 formal sector employment increased by only 1.5 per cent. The 1991 census found that the unemployment rate was 14 per cent. It has risen since then and is higher among women and young people; the age specific unemployment rate was 55 per cent in females and 46 per cent in males aged 15-19 in 1994 [Barclays Botswana, 1996].

Despite rapid economic growth, income distribution is extremely skewed [Economist Intelligence Unit, 1997]. Indeed, Botswana is believed to have one of the worst Gini coefficients in the world at 0.537 [Barclays Botswana, 1996]. However, the government spent a high proportion of its resources on social services and infrastructure. This placed Botswana fairly high on the United Nations Development Programme Human Development Index. In 1996 it was ranked at 72 [United Nations Development Programme, 1996].

Traditionally the Batswana were a mobile population, moving between their villages, the lands, where crops were grown, and the “cattle post”, remote grazing areas around which cattle are kept. The urban areas now provide a fourth destination, and the development of a good all-weather road network has greatly assisted in the movement of large sections of the population. Botswana is also a corridor for goods transported by road or rail from South Africa to Zambia, the Democratic Republic of the Congo, Angola, and Malawi, as well as from Namibia to its eastern neighbours.

Politically, the country is stable. Socially it is a country in flux, as indicated by the numbers of female-headed households; the number increased from 45.2 per cent of households to 47.1 per cent in 1991, while the proportion of ever-married women fell from 61.4 per cent in 1971 to 50.5 per cent in 1991. At the same time there was an increase in teenage childbearing, the percentage of teenagers who were mothers rising from 24 per cent in 1971 to 54 per cent in 1998 [Republic of Botswana, 1997].

It is evident that the population of Botswana is highly susceptible to HIV infection. The small population and the layer of highly skilled people as well as the level of social services provided may also make the country vulnerable, although it does have the resources to respond.

### **Rakai District, Uganda<sup>16</sup>**

The concepts of risk environment and susceptibility are epitomised in Uganda in the 1970s and early 80s, and nowhere more than in Rakai District, the district adjacent to Masaka from which the Ugandan HIV prevalence data used in this paper are drawn .

In this relatively isolated and predominantly rural area of Central Africa, the 1970s were a decade of civil disorder and warfare. The population had poor health status and a high prevalence of sexually transmitted diseases, which were often untreated or incompletely treated. Livelihoods were precarious and, with corrupt and disorganised government, revolved around illicit trade and smuggling across and around Lake Victoria. There was a pre-existing cultural imbalance in access to resources between men and women. To this was added an additional factor, the greatly increased income available to men prepared to take the risks associated with illicit trading. In these circumstances, many women entered into sexual liaisons of one kind or another along a continuum from "married" to "commercial sex-worker" in order to gain access to goods and services. Sexual liaisons became an important component of livelihood strategies for some younger women. In the absence of secure and independent rights to land, for many women this was one component in their efforts to support themselves and their children. This combination of illicit trading, rapid and often disassortative<sup>17</sup> sexual mixing, the proximity of long-distance lorry routes from the Kenyan coast to Burundi and Rwanda, and a war between invading Tanzanian and Ugandan forces and those of Idi Amin, gave rise to an environment in which any "new" sexually transmitted disease organism was bound to thrive. These factors, combined with poor medical services and high prevalence of STIs, meant that the epidemic rapidly became generalised. The conclusion is that Uganda was high, on any scale of

susceptibility, in the rapid spread of HIV.

Will the observed levels of death and sickness result in social and economic stress? In short, how vulnerable is Uganda to these excess levels in terms of their social and economic impacts? The evidence here is patchy and hard to interpret.

Uganda's high economic growth rate over the last 15 years, when GDP grew by 3.1 per cent between 1980 and 1990 and 6.6 per cent between 1990 and 1995 [World Bank, 1997], does not suggest that in terms of conventional economic measures the country was vulnerable at the macro-level to the impact of excess death and illness. It is probable that in the more specialised areas of economic life, the epidemic has reduced the availability of skilled and educated people, but the effect has not been measured. But it might be argued that this loss may have been counterbalanced by skilled people returning from exile in response to political changes.

It is important to bear in mind that macro-economic indicators do not measure "socially reproductive" activities (for example much of the work of those not "employed" in a formal sense), and the ability of Ugandan society to respond has reflected the reappearance of a relatively effective administration and the resurgence of an organised "civil society", after a decade and a half of civil disorder. The ability of the Uganda AIDS Commission to motivate and co-ordinate a multi-sectoral response to the epidemic since 1991<sup>18</sup> is one indication of this.

However, there have been and undoubtedly will continue to be widespread yet largely unrecorded instances of vulnerability to impact. In the most severely affected areas of Uganda, and particularly in parts of Rakai District, the dependency ratio has altered in small rural communities<sup>19</sup> [Low-Beer et al., 1997]. Work on households suggests that at this level AIDS deaths compound existing poverty and increase the numbers of those affected. Evidence from studies of agricultural production systems suggests that some may experience difficulties consequent upon low labour supplies at critical times of the year [Barnett and Blaikie, 1992; Barnett and Haslwimmer, 1994]. Excess orphaning appears to be putting some households and communities under pressure [Hunter and Williamson, 1998].

We may summarise the situation as follows. The health sector as a whole and the hospital sector in particular have been vulnerable. At the level of the household and the subsistence farm there is evidence of stress. The ability of the society to care for the unusual numbers of orphans created by the epidemic has meant that some households have come under stress, and traditional systems of coping with orphans have sometimes had to be revised and supplemented by community-based responses.

## **India: Rajasthan and Manipur**

### **Rajasthan<sup>20</sup>**

As far as is known, while rates of HIV are high in some towns and regions of India, they are not markedly high in the north western state of Rajasthan<sup>21</sup>. Its total area is about 342,000 km<sup>2</sup>, with a population of over 44 million people. Topographically, the state of Rajasthan can be divided into three areas. The Aravalli Hills, the Thar Desert in the north west of the state, and the more fertile and rainy areas to the east, around Jaipur and Bharatpur. There is some variation in climate across the state, but overall this is one of the driest areas of India.

Nearly 90 per cent of the population are Hindu, the balance Muslim and small numbers of Christians, Jains and Sikhs. Of the population, 12 per cent are "tribal" peoples, nearly double the national average. These people used to be hunter-gatherers living off the forests. Now, with the extensive deforestation which has

occurred, they are mainly subsistence farmers and daily-wage labourers both in the rural areas and in towns. This is a livelihood strategy of significance in the present context.

Poor people in this part of India are probably constrained less by access to land (although this can be a problem) but rather by access to irrigation. Unable to provide for themselves and their households from their land, both men and women enter various forms of labouring work. This may be daily, involve travel to nearby towns, more distant migration to other states (in the case of Rajasthan people travel to neighbouring Gujarat to work on the commercial cotton plantations for months at a time), and in some cases to other countries including the Gulf countries.

Despite decades of action by Indian politicians to lessen the influence of caste on people's lives, there is no doubt that at the local level, and particularly in rural areas, it has an effect on social relations. One only has to see people walking past each other and avoiding even eye contact, or having segregated wells, to know that it is a reality and that the caste system divides people. However, it does not apparently always divide people sexually; it merely adds an additional element of risk to what are often already clandestine relations.

Raised levels of STI prevalence, close urban/rural relations, marked income and wealth inequalities, gender inequality, heavy dependence upon long-distance lorry transport, and labour migration all contribute to the creation of a risk environment. In such circumstances it seems very likely that the social and economic conditions might be expected to facilitate rapid transmission of infection once bridging has occurred between high prevalence urban sub-populations and the general population. For the moment this does not seem to have occurred in Rajasthan. If the social and economic relations described in relation to this state can be found in other regions of India,<sup>22</sup> in particular the high levels of labour movement, locally, regionally, internationally and seasonally, the highly unequal distribution of wealth and income, and gender inequalities, then there are many features which suggest it constitutes a risk environment for the nation.

### **Manipur**<sup>23</sup>

The first case of AIDS was identified in an IVDU in Manipur in 1990. (The largest concentration of infections among IVDUs in India is in Manipur). In 1990, 95 per cent of those who were reported to be HIV+ were IVDUs. By 1997 this had dropped to 75 per cent, indicating that the wider population was becoming infected. In December 1997, the rate of HIV infection was estimated at 172 per thousand of the adult population. That figure was more than ten times the national seroprevalence level.

Currently Manipur is experiencing an epidemic among young urban men, but there are factors peculiar to this state that increase susceptibility. Manipur is geographically isolated and culturally distinct from much of the rest of India. It became part of the Indian union only in 1949, after a brief period of independence following the departure of the British. Some suggest that the main reason for its inclusion in the union was as a buffer zone against Chinese encroachment towards Assam and its oil reserves. The relationship between Manipur and India was, and has to a degree remained colonial. The area remained starved of investment until it achieved statehood in 1972. However, since then it has seen little in the way of development. It is this lack of economic activity combined with disrupted livelihoods and central government's neglect which underlie the high levels of youth unemployment; and it is youth unemployment which underlies the huge numbers of people who have become injecting drug users.

Proximity to Myanmar (with which it shares a long border) and the Golden Triangle are additional factors. Indeed, nowadays, the main drug-smuggling routes pass through Manipur and some of them have entrepôts in Imphal and in Moreh. Opposition forces in the area suggest that these activities exist with at least tacit and perhaps active co-operation from politicians, state officials, and local civil servants as well as elements

in the security forces - some of whom are outsiders and see assignment to Manipur as an opportunity to make money to supplement their salaries. These activists suggest that, ironically, it was sometimes the relatively wealthy sons of these people who were among the first IVDUs. With increasing urbanisation, the decay of the extended family and household system, few if any significant local industries and little sign of development, the situation is not going to change - except that the disease is now spreading from the IVDU community.

This epidemic is geographically localised in relation to the rest of India, and it is not clear that this risk environment is one which will facilitate bridges of infection to the general population of the state or even to the Indian union as a whole.

Any discussion of relative susceptibility and vulnerability in India must take account of the enormous diversity of the country. The situation in Rajasthan suggests a high level of susceptibility associated with the levels of population movement between rural and urban areas and in particular medium- and long-term labour migration. Levels of rural and urban poverty, and marked income and wealth inequality, suggest that many population sub-groups are likely to pursue livelihood strategies which expose them to infection. "Tribal" women have a reputation for participating in sex work on some of the transport routes. Poor households will be vulnerable to the impact of excess death and illness, and health systems will certainly be affected. Manipur's isolation suggests its epidemic is unlikely to contribute markedly to generalisation of the *Indian* epidemic. However, considered regionally, in relation to adjoining areas of Myanmar, the Manipur epidemic may generalise. National boundaries may disguise such epidemics and thus the region may be susceptible precisely because the populations at risk extend over an area where boundaries adjoin and where both official and illicit traders are active.

#### **Ukraine** [Barnett and Whiteside, 1997]

The break up of the Soviet Union had acute social, political and economic implications for the newly independent Ukraine. The Soviet system was highly centralised and controlled via four main mechanisms, the party, the internal security apparatuses, the official trade unions, and the administration. Entitlements to social, economic and cultural goods were largely administered within this structure. To a considerable degree, this was also true of personal identity, expression and morality (at least at the public level). The economy was integrated on a union-wide basis, with Ukraine specialising in heavy industry. Thus, 75 per cent of production was associated with capital goods and military requirements, and only 25 per cent with consumer goods.

Since independence, the economy has entered a period of acute decline, with negative growth rates. Real unemployment and underemployment (characterised by short- and part-time working) have become widespread. In 1995-6 around 18 per cent of the work force was on unpaid or partly paid leave while 5.6 per cent was on short time [Ukraine Statistical Annual, 1995]. Women make up a greater proportion of the registered unemployed than men. In some cases, this crisis of employment is geographically concentrated. For example, in areas of heavy industry, such as around Donetsk, entire communities have seen the virtual disappearance of their economic base. This has resulted in households where there is no wage earner, and communities where the actual levels of unemployment and underemployment are probably very much higher than reported averages. Thus specific regions and communities may be particularly susceptible to increased disease incidence.

For many people, the only way to survive has been through entering the "shadow economy", which is by its nature unregulated, unaccounted and often involves activities which are, at the very least, on the borderline of legality. The situation for young people is particularly difficult, the shadow economy providing the only way to make a living for many of them.

There has been much discussion on the levels of poverty in Ukraine, but it is reasonable to conclude from the Ukraine Health Initiative Report and from World Bank research [World Bank, 1996] that substantial sections of the Ukrainian population are poor and are having to work extremely hard to survive. One indicator is that mean household expenditure on food is around 57 per cent of total income. In these circumstances, most households have difficulty making a living, but single-parent households, the elderly and other vulnerable groups are finding it particularly hard. This analysis suggests that the economic situation will compound both susceptibility to infection and vulnerability to impact.

However, the transition and its consequences go far beyond the economic. The breakdown of the Soviet system has led to a gap in society, that normally occupied by "civil society", and the construction of this will be difficult and slow, yet it is crucial in halting and responding to the epidemic. In particular those people living with HIV are marginalised and excluded. Experience elsewhere shows that they have a vital role to play in developing policies for intervention and support services. This requires urgent attention. Transition is also affecting gender relations, although the evidence is that these were stressed before the transition. Household violence is common and most women complain that they have experienced "humiliation" in the home. Taken together with economic changes and the absence of civil society, changing gender relations will further increase susceptibility.

Areas of vulnerability include care of orphans and the elderly. Modelling of the epidemic suggests that AIDS will not have a significant demographic impact, but will considerably increase the number of orphans. The population dynamics of Ukraine are such that the elderly comprise a sizeable proportion of the population and numbers are increasing. While AIDS will not directly affect them it will affect their families - who are increasingly viewed as a source of support. The demographic consequences will be compounded by the inability of the state to provide the level of social services previously available, and it certainly will not be able to meet the increased demand.

The health sector will doubtless feel the impact of the epidemic. Given present HIV infection levels, the demand for beds will increase and the system of treating patients in specialised centres may not be sustainable; as demand rises the revenue and resources to meet it are contracting. Of particular concern is that Ukrainian patients may have expectations of high levels of care.

Finally one specific area of possible vulnerability for Ukraine derives from the nature of the economic transition. Ukraine is relying heavily on a breed of new entrepreneurs revitalising the economy, improving the revenue base, and creating employment. Entrepreneurs are by nature risk-takers and hence liable to be involved in the life-styles that creates the opportunity for HIV transmission. They are also "entrepreneurs" in the development of civil society. Here we are not referring to the very wealthy and the nouveaux riches. Rather we are talking of that wide swathe of Ukrainian society which is involved in activities from the purely criminal to the world of NGOs, and who have access to travel and relatively higher incomes as a result of their general abilities to behave innovatively. We regard these people potentially as particularly susceptible, and their susceptibility increases Ukraine's vulnerability.

## **Susceptibility and Vulnerability in finer detail**

These case studies illustrate how susceptibility and vulnerability vary from society to society, and within societies. However these concepts are too general for either analytical or practical purposes unless they are refined by additional parameters. This is achieved by focusing on relative susceptibility and relative vulnerability and locating variability around the main parameters of:

(a) the degree of social and economic differentiation;

(b) the degree of social control/order/cohesion in any particular society or part of a society.

### **Susceptibility: A conceptual approach to explaining and predicting the epidemic**

There have been a number of attempts to explain the different epidemics by developing indexes or statistical correlations, but they have not been very successful.<sup>24</sup> The problem is that some of the richer more developed African countries have serious epidemics, while others, despite economic and development determinants pointing to the potential for an AIDS epidemic, are not experiencing this. The indicators developed to date do not allow us to understand why. This section provides an outline of how the social and economic factors driving future epidemics might be explained, and the analysis employed to target interventions at different levels of "causation" outlined in Figure 1.

The organising hypothesis is that the shape of the epidemic curve i.e. how many people are infected and how rapidly the infection spreads, will be determined by two key variables:

- the degree of social cohesion in society and
- the overall level of wealth.

Social cohesion needs further explanation. It may derive from civil society, that part of society which occupies the space between the individual and the state, and the degree to which there is a perceived and acted-upon community of interest in a group or nation. It includes voluntary organisations, NGOs, churches, parent-teacher associations, indeed any grouping of people outside the household and workplace. Social cohesion may also stem from control through an authoritarian political or cultural system or from national beliefs and ideologies, especially organised religion. The unit of analysis may be a whole society but also may be a household or sub-community.

Wealth and income are relatively unproblematic concepts. Of considerable importance is Wilkinson's recent work on health and inequality [Wilkinson, 1996] which has reminded us of the relationship between general health, socio-economic inequality and the degree of social support available in a society. There is however no need to introduce inequality as an additional variable, as societies with low social cohesion and high wealth appear to have high Gini coefficients, indicating income inequality. This is a hypothesis meriting further research.

Combining these variables gives four broad logical "types" of society:

- Type 1, high social cohesion and high wealth - many societies of the rich world.
- Type 2, high social cohesion and low wealth - those societies with strong religious cultures or good governance.
- Type 3, low social cohesion and low wealth - countries experiencing civil war or economic collapse, such as Uganda in the early 1980s.
- Type 4, low social cohesion and high wealth - societies in transition, such as South Africa, where wealth is very unequally distributed.

With HIV/AIDS, a recent study of 72 countries showed that high urban adults rates of HIV infection were strongly associated with low national income and unequal distribution of income [World Bank, 1997].

If these factors are indeed major influences on the gradient and peak of the epidemic, then one would logically expect to see four different epidemic curves as set out in Figure 5.

Curve 1 describes the epidemic in a society with high levels of social cohesion and high income; a slow

growth is followed by a low peak and slow decline with low endemic prevalence. Curve 2 is a society with high levels of social cohesion and low income. Here we might expect to see levels of infection kept in check by socially defined behaviour. Thus a slow growth in prevalence will characterise this society. Curve 3 is a society with low levels of social cohesion and low income and; the epidemic may take time to gain momentum, but once it does so the curve will be exponential and the level of infection may remain high. The final curve, number 4, is a society with low levels of social cohesion and high income; here the curve will show a sharp increase in prevalence followed, hopefully, by a sharp decline. Although the society is susceptible to infection in the early stages, income means it has the capacity to respond.

There is evidence to support the hypothesis. It helps provide an explanation for observed epidemic curves. Rich societies like the UK follow curve one. Curve two may fit the reported experience of Senegal and North African countries. Epidemic curve three describes Uganda's situation until recently, and may reflect the situation in Rwanda and Liberia. Botswana and South Africa provide an example of curve four.

This analytical tool can also be applied to sub-groups in society or geographic areas. For example truck-drivers may enjoy relatively high income but the nature of their work may also mean that they are difficult to bring into the ambit of IEC programmes. They could thus be said to have a low level of social cohesion or be subject to low levels of social control. A young woman working as a bar-girl on the other hand, has both a low income and a low level of social cohesion/social control. As she may be marginalised and / or excluded in her society, she is less likely to be bound by rules of approved behaviour or be able to bind herself to these rules if she is to survive.

A number of further points must be made about this paradigm:

- Societies that are wealthy in aggregate but lack social cohesion often exhibit inequality in the distribution of that wealth.
- Societies can and do change. Social cohesion may break down or build up and countries may experience economic growth or decline. The case of Ukraine is germane as, along with other countries in the region, it makes the unprecedented transition from centralised state control to free market capitalism.
- The paradigm shows that growth alone is not the panacea. There also has to be economic and social development. This means addressing issues of equality, human rights and the construction of “civil society”. HIV/AIDS interventions that ignore these issues may not be effective or sustainable in the long-term.
- Finally, it is a clear justification for the interventions at the socio-economic and macro level, and adds weight to the view that governments have a substantial responsibility in this area.

The matrix is set out in Table 7, which suggests how the assessment of susceptibility and vulnerability can be made over time. In the case of the five case study countries in this article, they could be classified as shown in Table 8.

Uganda is now consistently reporting success stories in reducing both HIV incidence and prevalence. At the Nsambya sentinel surveillance site, prevalence among ANC attenders fell from a peak of 29.5 per cent in 1992 to 15.4 per cent in 1996, in Mbarara the peak was 30.2 per cent in 1992, in 1996 it was 15 per cent [Kayita and Kyakulaga, 1997]. It is no accident that this decline has come at a time when Ugandan society has been restructuring itself and there has been an expansion and strengthening of civil society, underpinned by efforts to introduce greater citizen confidence in government together with increased rates of economic growth. Many of the HIV and AIDS interventions may have contributed to slowing the epidemic - not because they were about AIDS, but because they were about building civil society and

taking responsibility. Indeed, there is some local evidence <sup>25</sup> that community action to confront the epidemic may have been a significant catalyst in the strengthening of civil society.

The case of Ukraine was included because it is a society experiencing a rapid transition from state to market, and this is illustrated in the changing epidemic which may, in its explosiveness, be assumed to be closely linked to the breakdown of previously strong social control (if not cohesion), increasing income inequality, the opening of international and internal boundaries, and the demise of centralised and effective STI control measures. Thus Ukraine illustrates a society moving from medium wealth and high social cohesion to a low wealth and low social cohesion.

### **Vulnerability: understanding and predicting impact**

The concept of vulnerability is clear, but it is more difficult to find evidence of actual impact. The reason is that AIDS is a new and unique disease. This means there is no country in the world where the epidemic has run its course, and it will be many decades before it does. 'Disasters do not happen, they unfold' [Blaikie et al., 1994]. This may be glaringly obvious in the case of 'slow-maturing' (slow-onset) disasters such as famine, the even slower AIDS pandemic, or ozone depletion, processes which unfold over a period of perhaps thirty to eighty years or more.

It may take decades for the full (macro) impact of the epidemic to be felt. Of course the micro level impact, at the household level, will be felt immediately by those affected. Evolving coping mechanisms are bound to confound predictions of the size, intensity and nature of impact. It is hardly surprising that households, firms and production units develop coping mechanisms; not to do so would be to cease to exist. But this makes it very much harder to predict impact. In some cases impact will not be apparent as individuals, households, firms and other socio-economic units disappear and their disappearance goes unremarked and uncounted.

### **Equity, Efficiency and Targeted Interventions**

HIV/AIDS has served to highlight more general debates about health policy. Central issues include the balance between market and non-market channels for interventions; the relative responsibilities of individuals, communities and governments; and, in poorer countries, the implications of structural adjustment policies <sup>26</sup> for health care generally and for HIV/AIDS responses in particular. It is now widely accepted that in conditions of scarcity, targeting is necessary. This may involve targeting of clinical care or of benefits associated with longer-term aspects of the epidemic - for example allocation of care and other benefits to increased numbers of orphans.<sup>27</sup> Decision makers at all levels are confronted with the practicalities of how to target scarce resources, what decision rules to follow, and how to develop decision algorithms. If the criteria are too restrictive, some needy people are excluded. That is inequitable. If the rules are drawn too loosely, some people benefit but are not in need. That is inefficient.

The general idea of targeting is a deceptively simple process of logical selection and judgement based on an assumed understanding of the distribution of need and of the processes which create need. Beyond this level of generality, it is necessary to understand the cultural, political, social and economic parameters of epidemics if targeting is to be efficient and equitable and the role of subjective judgements (which may disguise social and cultural prejudices) is to be reduced. Here we have provided a conceptual framework for understanding the social and economic parameters of the HIV/AIDS epidemic. On the basis of that framework, we have suggested a conceptual framework for identification of susceptible and vulnerable groups which should lead to more effective targeting of interventions in relation both to epidemic prevention

and mitigation and also to the medium- to long-term social and economic impacts of increased morbidity and mortality. Many of the operational issues of targeting are discussed in World Bank, 1998.

Such precise targeting may also have very important public health consequences for the following reasons. On the one hand it has been argued that, particularly in the earlier stages of the epidemic, core group targeting of preventive measures is very efficient in both public health and financial terms [Cohen and Trussell, 1996]. On the other hand, when an epidemic has reached a mature stage and the short- and medium-term social and economic impacts are apparent, targeting contributes to mitigating the impact of the epidemic and resolving equity/efficiency problems.

Finally, it is important to remark that “impact” will only become apparent if we look for it and choose to see it. Among the very poor the impact is likely to go unremarked by the authorities; among the wealthy it will be coped with and the costs absorbed. However, as with wars, while societies adjust to excess mortality, disability and disruption, their costs are borne by future generations in a myriad of ways ranging from an absence of resources to an absence of spouses. The impact of a long-wave epidemic may be hard to see but the conceptual framework described in this article can provide some first steps in seeing what is happening and to what extent, and provide an idea of how interventions aimed at issues of susceptibility and vulnerability might be more effectively targeted in the context of development.

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## NOTES

<sup>1</sup> It may also be necessary to consider a third epidemic curve, that of tuberculosis, which is increasingly associated with the HIV/AIDS epidemic.

<sup>2</sup> This graph was downloaded from a Metropolitan Life (South Africa) website.

<sup>3</sup> The World Bank has developed a typology of a three stage epidemic. Stage 1: Nascent is where HIV prevalence is less than 5 per cent in all sub-populations who practice high risk behaviour. Stage 2: Concentrated, where HIV prevalence is higher than 5 per cent in high risk groups but lower than 5 per cent among pregnant women in urban ante-natal clinics. Stage 3: Generalised, when high risk groups are heavily infected and prevalence is higher than 5 percent among antenatal clinic attenders [World Bank, 1997: 87].

<sup>4</sup> This table is reproduced by kind permission of the Public Health Laboratory Service, Conlindale, London

<sup>5</sup> The most common sources of HIV data are the surveys of women attending ante-natal clinics. What happens is that samples are taken from expectant mothers for a variety of routine tests. A portion of this blood is sent for HIV testing and will be marked (typically) with the age, location and possibly some other socio-economic data. Thus a particular blood sample cannot be linked to an individual. The survey will be done over a period of time in order to obtain enough samples for statistical validity. The major problem with this method of data collection is that it is usually confined to public facilities, and coverage will vary according to particular circumstances of access to medical facilities, public and private, in any setting.

<sup>6</sup> There is no vaccine. Multi-drug therapy appears to prolong life but is expensive, requires sophisticated medical backup, and will not be available to the huge numbers infected world wide [Adler, 1998]. Condoms are problematic, not least because they require male compliance. The development of virucides which might offer greater female control over matters of sexual health has inexplicably lagged behind other interventions. Treating other STDs reduces rates of HIV transmission but there are questions as to the sustainability and cost of such programmes [Lamprey et al., 1997].

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Behaviour change interventions do work, as has been seen in the US and Western gay communities and Thai brothels, but are slow to reach entire populations.

<sup>7</sup> This notion was first explored in Barnett and Blaikie, 1992.

<sup>8</sup> Data for this section are taken from AIDS/HIV Quarterly Surveillance Tables no. 36, 97/2, August 1997. These reports are published by the Public Health Laboratory Service AIDS and STD Centre, and the Scottish Centre for Infection and Environmental Health.

<sup>9</sup> The definition used in the PHLS AIDS and STD Centre tables (for example, Table 1) is "individuals from abroad and individuals from the UK who have visited abroad, for whom there is no evidence of "high risk" partners."

<sup>10</sup> The data for tables 4 and 5 are derived from two sources: National AIDS Control Organisation, Ministry of Health and Family Welfare, Government of India, (June 23-25, 1997): HIV/AIDS in India: a Status Report, prepared for India Development Forum, Paris, and Country Scenario Update, National AIDS Control Programme India, National AIDS Control Organisation, Ministry of Health and Family Welfare, Government of India, Delhi, December 1995.

<sup>11</sup> The contrast between the high reported prevalence in Manipur and the lower reports from adjoining areas across national boundaries is undoubtedly the result of reporting error or absence in those areas.

<sup>12</sup> The data for this section are taken from the report The Social and Economic Impact of HIV/AIDS in Ukraine, prepared by the present authors for the British Council and UNAIDS, Kyiv, 1997. This report was prepared in close co-operation with the following: Lev Khodakevich, Yuri Kruglov and Valentyna Steshenko. This report is available on the web site of the British Council, Kyiv.

<sup>13</sup> To many readers, the scale of testing in Ukraine may seem unbelievable. However, it was done and documented, see for example: Hamers, 1997 and Barnett and Whiteside, 1997.

<sup>14</sup> This work was done by Barbara Mason and Greg Woods using Spectrum Policy Modelling System developed by The Futures Group International.

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<sup>15</sup> It has been impossible to identify any study to support this assertion. However, personal communications from individuals at the PHLS suggest that this has indeed been the case.

<sup>16</sup> The social and political history of Rakai and Uganda are discussed at greater length in Barnett and Blaikie, 1992.

<sup>17</sup> “Disassortative sexual mixing” means that sexual partners are drawn from beyond the peer group and geographical area which is usual in that society.

<sup>18</sup> The multi-sectoral AIDS Control Strategy began to be developed in July 1991 and the Uganda AIDS Commission was established in 1992 to oversee and co-ordinate the strategy. It is located in the Office of the President.

<sup>19</sup> This was evident in 1989 when one of the present authors did the original small-scale study for Barnett and Blaikie, 1992. However, more recent evidence has lent support to this view based on census data. These data are discussed in Low-Beer, et al., 1997.

<sup>20</sup> This case study is discussed in greater detail in Barnett, 1995.

<sup>21</sup> As of June 30 1997, of a total of 21 014 samples screened (which may include duplicates) in the state, 234 had tested positive, which is 11 per thousand compared with the national rate of 20.82 per thousand. National Aids Control Organisation, Ministry of Health and Family Welfare, Government of India, Delhi, 1997. The data for the end of 1997 show a increase to just over 12 per thousand.

<sup>22</sup> Brief observation of the relations between rural Bihar around Giridih and the towns on the railway line to Calcutta in 1991 suggest that many of these features are present in that area.

<sup>23</sup> Information for this section is based on interviews conducted in India in 1997. Statistical data were collected from Manipuri informants and have not been checked for consistency with published sources.

<sup>24</sup> See for example Fransen and Whiteside, 1995 and Filmer, 1996.

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<sup>25</sup> Barnett, T., fieldwork, 1993 - personal interviews in Uganda.

<sup>26</sup> The process of making policy changes in a country's economy to adjust it to a changing external environment. The usual result has been abrupt and swingeing cuts in public expenditure. The lead agency has been the World Bank.

<sup>27</sup> For discussion of these issues, see: Hunter and Williamson, 1997, Hunter, 1990, Ankrah, 1991 and Levine, 1992.