The Social Ecology of AIDS in Africa

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"Societies are complex, and complexity calls for caution" (Susser, 1987:171)

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The incidence of AIDS in populations

The practice of epidemiology, according to Geoffrey Rose, is based on the question "Why did *this* patient get *this* disease at *this* time" (Rose, 1985). Epidemiologists can be quite good at detecting the causes of illness by comparing individuals with different levels of exposure to hypothesised risk factors or infectious agents. This is how we know that HIV causes AIDS, and how we know that certain behaviours are associated with a higher or lower risk of transmission of HIV.

When we look at AIDS epidemics as social phenomena, however, an entirely different etiological question arises: "Why do some populations have much AIDS, while it is rare in others?" This type of question was asked by Rose when comparing the incidence of arterial hypertension between Kenyan nomads and civil servants in London. The answer, he found, "has to do with determinants of the population mean. What distinguishes the two groups has nothing to do with the characteristics of individuals; it is rather a shift of the whole distribution—a mass influence acting on the population as a whole" (Rose, 1985: 33). The determinants of this shift are the main subjects of reflection for "social epidemiology," a field of study that is still in its infancy and has not yet developed a clear theoretical framework (Krieger, 2001).

Whatever the reason for a particular "shift in distribution," it may appear rather insignificant and small yet yield spectacular differences in the population incidence of disease. This has been demonstrated for heart disease (Rose, 1985), suicide (Durkheim, 1951), homicide (Marmot, 1998), psychiatric illness (Rose, 1992), diabetes (McKinlay and Marceau, 2000), alcoholism (Marmot, 1998), syphilis (Kilmarx et al., 1997), and many other conditions of ill health. It is at the base of one of the most important discoveries in public health—the prevention paradox: "A preventive measure that brings large benefits to the community offers little to each participating individual" (Rose, 1992: 12).

If we select a few locations in sub-Saharan Africa with reasonably consistent series of epidemiological surveillance data for HIV and plot these data on a graph, the design we are most likely to obtain looks suspiciously like a box full of snakes. There is no recognisable pattern. Figure 1 shows an example of HIV prevalence over a nine year period among women attending ante-natal clinics in Zinguinchor (Sénégal), Abidjan (Côte d'Ivoire), Francistown (Botswana), and Mbarara (Uganda) (UNAIDS/WHO 2000).

This heterogeneity of HIV epidemics is well known. There are, of course, many explanations: The different time of introduction of HIV; the properties of different viral strains; the prevalence of underlying genital tract pathology; the prevalence of male circumcision, population mobility, and variations in behavioural norms. But one-dimensional causal theories are inept in predicting the profile and course of HIV epidemics. There are many examples of local epidemics that seem to defy conventional theories of risk. For instance:

- *Early age of sexual initiation among girls is associated with high prevalence of HIV.* In Ghana, about 60 percent of girls aged 15 to 19 are sexually active, compared to only about 30 percent in Zimbabwe (Singh et al., 2000). Yet, the HIV prevalence in Zimbabwe is more than five times as high as in Ghana.
- *Low prevalence of male circumcision is associated with high prevalence of HIV.* In Malawi, male circumcision is almost universal among the Yao and Lomwe people in the South while it is rarely practised in the North. Yet the HIV prevalence is generally higher in both rural and urban areas of the Southern Region than in the North. (UNAIDS/WHO 2000)
- *The prevalence of HIV in a society is related to the average number of sexual partners outside marriage and stable relationships.* Men and women in Côte d'Ivoire report consistently more "irregular sexual partners" than in Zambia (Caraël, 1995), yet the HIV prevalence in Lusaka is more than twice the rate in Abidjan.
- *The prevalence of HIV decreases when people use condoms more frequently.* Between 1994 and 1998 only 5.1 percent of Ugandans reported that they used a condom during intercourse with their last non-regular partner, compared to 22.2 percent of Kenyans and Zambians (combined population). Meanwhile, HIV prevalence in Uganda was falling rapidly while it was static in Zambia and climbing in Kenya (Stoneburner, 2000).

Sometimes we can make causal inferences on the basis of average behavioural profiles. For instance, the fact that settlements along major trucking routes in Africa have a higher than average HIV prevalence is most certainly related to the typical sexual behaviour of the men who drive trucks along these roads and the women who live in these settlements. But once we arrive at a behavioural

explanation, we still do not know why people at this time in this particular location behave in a way that puts their health in serious peril. Without this knowledge our ability to intervene is restricted to exhortation for behavioural change; an approach of doubtful effectiveness.

The complexity of this situation was stated bluntly by President Thabo Mbeki of South Africa in his opening speech of the XII International Conference on AIDS in Durban: “As I listened and heard the whole story told about our country, it seemed to me that we could not blame everything on a single virus” (Mbeki, 2000). An intelligent remark by a careful observer. Yet, it fuelled a storm of protest that most certainly damaged his political career.

In fact, even the most vociferous critics of President Mbeki have to admit that they have neither the theory nor the data to explain the widely diverging patterns of AIDS epidemics in Africa or anywhere else. What our preoccupation with examining risk factors has provided us so far is, in the words of McMichael, an explanation and quantification for the “bobbing of corks on the surface of waters, while largely disregarding the stronger undercurrents that determine where, on average the cluster of corks ends up along the shoreline of risk” (McMichael, 1995: 633).

There is, of course, the possibility that all epidemiological curves of HIV would look similar were it not for the success of national AIDS prevention efforts. Would the epidemic in Ziguinchor look like the epidemic in Abidjan had it not been for the political commitment of the Government of Sénégal to fight AIDS? Would the epidemic in Mbarara today look like the epidemic in Francistown had it not been for the vigorous response to AIDS by the Museveni Government in Uganda? We will never know and there is certainly no reason to discount or belittle the efforts of national prevention programmes. However, the profile of the HIV epidemic in Mbarara, Uganda looks a lot like the profile of the epidemic in Bukoba, Tanzania. The HIV prevalence in Ziguinchor, Sénégal is no lower than the prevalence in Nouakchott, Mauritania. It is highly unlikely that programming in Uganda and Sénégal spilled across the borders into Tanzania and Mauritania. The more likely explanation is that there are similarities within the two pairs of neighbouring locations that somehow resulted in similar experiences of HIV epidemics.

The social ecology of AIDS

“Ecology” is a descriptive term applied to complex relationships between organisms and their environment (Hawley, 1950). Its application to social phenomena, i.e. the conceptualisation of “social ecology” started about 25 years ago by a group based at the University of California at Irvine (Whiteley, 1999). Whiteley, quoting Dave Taylor, one of the founders of the social ecology theory, lists the six principles of social ecology analysis as follows:

- Identify a phenomenon as a social problem
- View the problem from multiple levels and methods of analysis
- Utilise and apply diverse theoretical perspectives
- Recognise human-environment interactions as dynamic and active processes
- Consider the social, historical, cultural, and institutional contexts of people-environment relations
- Understand people’s lives in an everyday sense

For example, an enquiry into breast cancer in a community, would look at the genetic make up, the diet, the social profile, the ethnic mix, the availability and accessibility of health services, the types of community support structures, the level of exposure to environmental toxins or radiation, the experiences of women who had undergone mastectomies, etc. The sources of information for such an enquiry would have to come from the field of genetics, nutrition, behavioural psychology, public health, anthropology, and many more. Each field would bring to it its unique theoretical perspective.

Such an enquiry would generate quite different results from a classical epidemiological study that may only tell us that the community has a high incidence of breast cancer because the women have too few children and eat too much fat. A social ecology analysis, on the other hand, would give us an idea why these and other risk factors for breast cancer are particularly prevalent in this community. What are the trade-offs for women in this community? Is the increased risk of breast cancer an acceptable trade off for the career opportunities afforded by not having children? What is reasonable nutritional advice, given the means and customs of the community? What is the experience of women with breast cancer? How do they cope and can the coping be improved?

When it comes to research on AIDS, we should think that an analysis of the social ecology is the standard and dominant form of enquiry. Pronouncements that AIDS is a social issue are ubiquitous and are part of any discourse on AIDS that aspires to political correctness. Every political document on AIDS written since 1995 includes the word “multi-sectoral” which, at least in theory, promises multiple levels and methods of analysis. Yet, beyond the jargon, the elements of a social ecology framework are rarely incorporated into the questions about and responses to AIDS. Our gaze remains “obsessively fixed on the individual and his/her responsibility” (Waterston, 1997). In fact, within the last five years we may have entered into “a new era of creeping absolutism,” where “biomedical advances are given premature credit for what they can achieve in HIV control” (Donovan and Ross, 2000:1897).

Why are most efforts to address AIDS in Africa based on reductionist analyses of causation at the individual level, although there is so much lip service paid to the “social” dimension? It is evident that there is more commercial interest in devising and implementing programmes centred on individuals. The real and potential profits in the pharmaceutical and biotechnology sector are well known and often talked about. But even non-profit development contractors delivering programmes for large donor agencies (from condom marketing to STD control, to voluntary counselling and testing) have an economic interest in the growth of these projects. By contrast, the economic opportunities created by an ecological and social policy analysis are relatively minor. While many people like to talk about cultural and social determinants of AIDS, there is not much fiscal incentive for anybody to translate this discourse into activities.

This, however, is not the only reason. There are also epistemological and methodological problems with the application of a social ecology paradigm to the issue of AIDS. We are quite clear about the outcome we want to explain and ultimately influence: the population incidence of HIV in a society. This information is available or can be obtained. The fact that we are measuring prevalence rather than incidence is irrelevant in the long run. But what are the exposure variables? “All societies are complex and multi-faceted. Each has innumerable features that might be measured and tested for their potential contributions to the configuration of health and disease” (Susser, 1987:194).

How can we do justice to this level of complexity? What are we looking for when we are looking for the cause of high or low population incidence of HIV? The tools of epidemiological risk factor analysis allow us to determine which among a number of chosen factors are “significant,” that is, highly likely to be associated with the level of HIV prevalence and not just by chance. This method does not tell us whether this is a causal association or the direction of the causation. More importantly, the method does not tell us which factor to look at in the first place. Whatever we select to be examined most certainly reflects our own bias and ideology. And if we select and test enough factors, we will always find a few apparently significant associations. That is an unalterable law of probability.

Epidemiological techniques of risk factor analysis are quite adequate in researching the causes of HIV infection in individuals. After all, the potential exposure variables are rather limited. These techniques, however, are woefully inadequate in constructing a causal theory for population incidence of HIV. Whatever set of exposure variables we examine will be based on our own theoretical or ideological biases. This does not mean that the findings will be wrong, they are just insufficient and biased by our own pre-selection. There is little doubt, for instance, that the prevalence of male circumcision influences the profile of HIV epidemics (Weiss, 2000), but how useful is this information in trying to understand and respond to the spread of HIV in a particular social context? People circumcise little boys for many different reasons and under many different circumstances. These reasons and circumstances themselves are linked to other factors that also have an impact on HIV transmission. Examining the effect of male circumcision by “holding everything else constant” is a useful approach for some purposes. Unfortunately in life “everything else” is never constant, and that complexity is lost in the analysis.

One large study of multivariate risk factor analysis was conducted by Over (Over, 1998). His analysis of urban HIV prevalence rates in 50 countries found eight aggregate variables that were able to explain more than half of the differences in national urban HIV prevalence rates:

- The age of the epidemic
- The per capita Gross National Product (GNP)
- The proportion of the population that is foreign born
- The proportion of the population that is Muslim

- The Gini coefficient[1]
- The male – female literacy gap
- The urban male/female gender ratio in the 20 to 39 age group
- The size of the military forces in proportion to the total urban population

The analysis confirmed much that was already known, offered some new insights, and raised many questions. However, the number of cases (50 countries) is small, especially when examining multiple variables. The selected exposure variables are but a few characteristics of 50 widely divergent societies. And almost half of the variation between the countries remains unexplained.

In 1994, a "study group on the heterogeneity of HIV epidemics in African cities" was formed to find explanations for the observed difference in the rate of spread of HIV. The findings of the group were published in 2001 as a doctoral thesis (Buvé, 2001), and soon after as a supplement to the Journal AIDS (Caraël and Holmes, 2001). The group selected population samples of about 1,500 young adults in four African cities. Two study populations, Yaoundé in Cameroun and Cotonou in Bénin, were known for their relatively low HIV prevalence. These study populations had HIV prevalence rates of 4.4 and 6.6 percent respectively. The other two cities, Kisumu in Kenya and Ndola in Zambia were known for their high HIV prevalence. The study populations in these two cities had HIV prevalence rates of 27.3 and 31.2 percent respectively. Using the population samples, the study group examined factors likely to affect the rate of HIV transmission in the four cities according to standardised research protocols. These included variables of sexual behaviour such as age of first intercourse and prevalence of concurrent sexual partnerships, prevalence of specific genital tract infections, male circumcision rates, and the prevalence of commercial sex.

The results of the "four city study" are surprising. Sexual behaviour, sexual practices, and condom use appear to have no impact on the rate of spread of HIV. For instance, in Yaoundé, a city with low HIV prevalence, men and women reported more lifetime and more concurrent sexual partners, and men reported more intercourse with sex workers than in Ndola and Kisumu where HIV prevalence was about five times higher. Condom use was about equal in all four cities. There were only three factors associated with higher HIV prevalence within each study population that were also more common in the "high prevalence" cities than in the "low prevalence" cities. These were lack of male circumcision, high prevalence of Herpes Simplex Virus II (HSV 2) infection, and being married.

It is plausible that the findings that the prevalence of male circumcision and of HSV 2 infection are important factors for the dynamics of HIV epidemics. The relationship between high HIV prevalence and early marriage, on the other hand, is unlikely to be causal, unless early marriage is always associated with early sexual debut. But the limitations of the study are clear. Randomly choosing comparable study populations in all four sites and comparing the frequency of individual characteristics among the four populations excludes any social characteristic from the analysis other than frequencies of behaviours. We know that there are more polygamists in Cotonou, that women in Kisumu marry at a younger age, and that men in Ndola are more likely to use a condom with a non-spousal partner. But we know nothing about the context in which these behaviours occur.

Deconstructing societies into quantifiable components or aggregating individual risk factor frequencies into a "social analysis" is the predominant approach used in positivist scientific reasoning. Positivism is based on the belief that if you observe, describe, quantify, and explain all the component parts of a system, you will generate an objectively real understanding of it. If you observe enough regularities of events to say that *x* causes *y*, you will be able to eventually decipher all universal laws of nature. About universality Susser noted: "Above the level of molecules, no biological entity can conform entirely to universal laws because of overarching contexts and the interaction between levels within a biological structure. The banal fact is that each society is influenced by its economic, political, and cultural circumstances as well as by its mix of peoples, climate, and topography. What is most universal is least biological and, most of all, least human" (Susser and Susser, 1996:675). We will have to come to terms with the fact that positivist causal reasoning is not very applicable to the study of populations within an ecological framework.

[1] The Gini coefficient is a measure of income inequality. It is the ratio of the area between the Lorenz curve and the 45 degree line and the area of the entire triangle. The coefficient approaches zero as the distribution of income approaches absolute equality.

If we cannot construct universal causal theories for the population incidence of HIV by analysing and comparing enough small generic units of the population, we are left with ecologic studies that relate the profiles of HIV epidemics to a description of the social environment in which they occur. This type of enquiry is not new. In the social science literature it is referred to as a constructivist or naturalistic enquiry (Lincoln, 1992). We will have to overcome three major obstacles. The first is the widespread belief that "ecologic analyses are not to be trusted" (Poole, 1994:715). The second is the view that anything that is not quantified is not "scientific." The third is the tendency of politicians and international civil servants to interpret and present reality in terms of their own success and, by implication, in terms of other people's failure.

We recently tried to reconstruct a historical view of the HIV epidemic in Zimbabwe using the approach of social ecology, that is, viewing the epidemic from multiple levels and methods of analysis, applying diverse theoretical perspectives, and considering the social, historical, cultural, and institutional contexts of people-environment relations (Decosas and Padian, 2001). The study, based entirely on the review of existing data, showed a major problem of applying a social ecology perspective: the question of scale. Zimbabwe has a mature, wide-spread HIV epidemic with a very high national HIV prevalence rate of approximately 25 percent among the young adult population. The colonial and post-colonial history of the country, of the distribution of wealth, the decade of economic decline, the uprooting of Shona culture by colonialist invasion, the disruption of families by the migrant labour system, and the highly divisive and parochial politics of the recent post-colonial era are all plausible causal contributors to the high population incidence of HIV. However, there is too much heterogeneity within the country, in terms of social organisation and in terms of the profile of HIV, to create a picture that goes beyond generalities. The description offers some explanations for the severe HIV epidemic experienced by the population of Zimbabwe but it does not provide much detailed guidance as to what can be done about it.

A similar analytic approach was taken by Barnett and Whiteside in their comparison of the five HIV epidemics in the UK, Botswana, Uganda, India, and the Ukraine (Barnett and Whiteside, 1999). The five case studies illustrate how susceptibility to HIV epidemics and vulnerability to the impact of AIDS vary from society to society and influence the profile of the population incidence of HIV. However, as the authors point out, the results of such an analysis are too general for practical purposes unless they are refined by additional parameters. This refinement is achieved by the development of a theoretical framework that aggregates the social exposure variables into two main parameters: The level of wealth and the degree of social control, order, or cohesion. The framework, described under the name "Jaipur Paradigm" in somewhat greater detail in a later publication (Barnett, Whiteside, and Decosas, 2000), has reasonable power to predict the shape of HIV epidemics at the national level, but it appears that its real value is in its application to social settings on a smaller scale: Refugee camps, villages, neighbourhoods in large cities.

Finally, a more empirical and data-driven approach to social ecology analysis was conducted in the United States in order to explain county-specific variations in the prevalence of syphilis (Kilmarx et al., 1997; Thomas et al., 1999). In practical terms, the main distinction between syphilis and HIV epidemics is the fact that the quality and availability of health care services directly influence syphilis prevalence. Before the advent of widely available anti-retroviral therapy, the main impact of heath care services on HIV epidemics was mediated by the medical treatment of conditions facilitating HIV transmission. Nevertheless, there are more commonalties than differences in the analysis of the population incidence of HIV infection and syphilis.

The first study (Kilmarx et al., 1997) was a multivariate analysis of sociodemographic characteristics to explain the variation of syphilis prevalence among approximately 3000 counties in the United States. The study used the same technique as the study by Over of social determinants of urban HIV prevalence described above (Over, 1998). It yielded five social, demographic and geographic variables that were able to explain 71 percent of the county differences in syphilis rates:

- Proportion of non-Hispanic Black population
- County location in the South
- Proportion of urban population
- Proportion of Hispanic population
- Proportion of births to women below 20 years of age

As in the Over study, these variables are interesting but offer little guidance for prevention programming. However, the researchers did not stop there. The second study in the series (Thomas et al., 1999) examined the 12 counties in the sample that had significantly higher or significantly lower syphilis prevalence than predicted by the regression model. This time the researchers used an entirely qualitative study design primarily involving observation and unstructured interviews. They found an array of additional social characteristics that were linked to high prevalence of syphilis:

- Highly unequal distribution of political power among different ethnic groups
- Poor or absent social organisation of minority ethnic groups
- Lack of employment opportunities
- A high level of inequality in income and social status
- Physical, cultural, and language barriers to access to health services
- Little interaction between social service agencies and the community
- Discord and competition between different social service providers and between service providers and community organisations (primarily churches)

These are exciting findings. They offer real opportunities for social programming in the locations of high syphilis prevalence. They also complete a theoretical framework that fits the data obtained by Over, the situation we found in Zimbabwe, and the framework developed by Barnett and Whiteside. The common thread found in all studies is that high population incidence of HIV (or syphilis) is associated with poor social cohesion. In national level studies this factor may be masked. Over's "proportion of Muslims," associated with low HIV prevalence, is likely a measure of social control and homogeneity. His "proportion of foreign born population," associated with high HIV prevalence, is likely measure of social diversity. What the Thomas study tells us is that the important exposure variables in the causal chain of a community's health profile are the way social groups in the community are organised and the way social, political, and economic power is distributed among them, rather than the level of diversity of community members. All four studies also found an association of a high level of economic inequality with high HIV or syphilis prevalence. Economic inequality is, however, one of the characteristics of non-cohesive societies. In fact, Wilkinson argues that poor social cohesion is the link between the well documented association of high levels of income inequality and poor health (Wilkinson, 1999).

Social cohesion

In Uganda, the overall HIV prevalence among women attending antenatal clinics peaked in 1991 at about 21 percent, a level of infection that is not surpassed in many countries. Still, while countries such as Zambia have experienced relatively stable antenatal HIV prevalence rates at about the same level (19 to 20 percent) from 1992 to 1998, the rates in Uganda declined relatively quickly, reaching a level of below 10 percent in 1998. There is good evidence and a general consensus that the main reason for the unprecedented rapid decline in Uganda was a shift in the behavioural profile of the population (Stoneburner, 2000). The question that has not been answered to anyone's satisfaction, however, is why this shift occurred so much sooner and faster in Uganda than in other countries. The international focus on Uganda's prevention policy and programme "success"—although it may well explain a part of the picture—is too obviously political and self-serving to have much credibility.

One attempt to explain the shift in the behavioural profile in Uganda was a look at knowledge diffusion using data from available surveys in Uganda and an aggregate of Southern African countries (Low-Beer et al., 2000). Most of these countries have reached or surpassed the levels of HIV infection observed in Uganda in 1991, but none of them have experienced the same level of decline in prevalence. The study compared personal networks for acquiring AIDS knowledge in Uganda with Southern African countries, and generated diffusion models of both HIV and of personalised information about it. The findings of the study are that a major determinant of the behavioural profile of a population is the personalisation of risk. Sufficient personalisation to shift the distribution curve of risk behaviour occurs when about 90 percent of the population know a person who has died from or is living with AIDS. Models of knowledge diffusion networks in Uganda showed that this level was reached when HIV prevalence was at about 5 to 10 percent, while in the aggregate of Southern African countries it required an HIV prevalence of about 20 percent to reach the same level of risk personalisation.

As the study concludes and as has been the main publicity message of the "Ugandan success," a general openness to the discussion of AIDS and a national policy that discourages stigmatisation are indispensable to the creation of an environment where risk personalisation can occur early in the epidemic. They are, however, not sufficient. You also need the networks of channels by which the information can travel. Thomas' study in the United States found that in a county with high syphilis rates and a large Hispanic population, "the Hispanics interviewed could not identify any local Hispanic leader or spokesperson for their interests. There was no Spanish language newspaper or newsletter in the county [and] the minority population in this county did not appear to be organised to make its collective voice heard" (Thomas et al., 1999:1094). This apparent lack of collective action was not observed in the minority communities in the counties with lower than expected syphilis prevalence. This suggests that the types of communication channels that exist within a community, as well as their reach and quality, influence a community's health at least as much as the quantity of the messages that flow through these channels.

Social cohesion is one parameter that captures the quality of intra-community dynamics and communication. It is one of the two "exposure variables" of the Jaipur Paradigm, and it has frequently been linked to community health outcomes (Barnett, Whiteside, and Decosas, 2000). The social ecologists in fact define social health as characterised by a high level of "social cohesion at organisational and community levels" (Stokols, 1992:9). According to Stokols, good social health includes "high levels of social contact and co-operation, commitment to and satisfaction with organisation and community, productivity and innovation at organisational and community levels, high levels of perceived quality of life, and prevalence of health-promotive, injury-preventive, and environmentally protective behaviour." Social cohesion is thereby shifting from being a determinant of individual health (a variable of exposure) to a defining characteristic of a community's health (a variable of outcome). In examining this issue from the perspective of the health effects of income inequality, Wilkinson clarifies this double role: "Inevitably the causes of health and illness must always boil down to individual exposure to risk, but the exposures themselves (who and how many are exposed to what) are almost always determined by societal processes." Social cohesion is likely to work both ways: as an expression of social confidence of individuals, but also as a [characteristic of the] social environment which will feedback to increase people's sense of confidence, trust in others, and inclusion" (Wilkinson, 1999). That this "sense of trust" has a measurable effect on population health was reported by Kawachi and colleagues in their study finding a close correlation between mortality rates in US states and a measure of how much people trusted each other (Kawachi et al., 1997).

Maxwell defined social cohesion as follows (Maxwell, 1997):

- People have a sense that they are engaged in a common enterprise
- They believe they are facing shared challenges
- They are members of the same community
- They are hopeful

The question remains whether such a definition offers an analytical fulcrum to explain the divergent patterns of HIV epidemics in Africa and, as a consequence, offers programmatic guidance to overcome the emptiness in the current phraseology of AIDS as a social issue.

On a large scale, countries can be classified as being more or less socially cohesive on the basis of the distribution of income, the level of ethnic or social tension, and the presence of strong conformist and controlling religions, ideologies, and political regimes. As Barnett and colleagues point out, there is a transition from cohesion based on a strong civil society to control or even frank repression under an organising ideology (Barnett, Whiteside, and Decosas, 2000). Strongly repressed societies may show the same epidemiological advantage as strongly cohesive societies. When repression ends, however, there is often a rapid shift into the opposite risk pattern as illustrated on the example of the Ukraine (Barnett and Whiteside, 1999). Islam, as a highly controlling social framework, is clearly correlated with lower population incidence of HIV in most countries. This is usually related to a very strong social consensus about the strict behavioural prescriptions of Islam, but in some locations Islam is used as an instrument of frank repression. An assessment of the level of social cohesion or control allows us, in hindsight, to "explain" many of the observed national epidemiological HIV curves in Africa. It can explain why HIV prevalence fell so rapidly in post-revolutionary Uganda. Why it has reached such high levels in the Southern cone of the continent that is still struggling with a colonial legacy of an entirely different dimension than the rest of Africa. Why HIV has never established itself

as a major epidemic in much of the Northern part of the continent. There are some spectacular outliers, for instance Somalia, which shows anything but national social cohesion yet does not have a major HIV epidemic, but we can probably find a good explanation for this.

In order to translate the recognition of the causal relationship between social cohesion and population HIV incidence into feasible programmes and responses, we have to look at a much smaller scale than entire countries. Early in the HIV pandemic, researchers studying the gay community in California found ample evidence of a strong relationship between personal risk reduction and perceived adequacy of emotional support from peers (Levine, 1992). The feeling of being supported by your peers is certainly an expression of social cohesion as defined by Maxwell. The finding helped us recognise the value of peer action networks and of overcoming the prevention / care barrier. Although this knowledge had to be rediscovered in AIDS programming in Africa, some mutual learning did take place across the Atlantic. But what was ignored in the transfer of knowledge was the analysis of scale. Peer support among the gay community in the USA worked well without "national co-ordination" or "National AIDS Control Programmes." But when international agencies imported the idea to Africa, they did it in their habitual format. What we ended up with were billboards on the road to the international airport. Social cohesion at the community level were quickly forgotten if it was ever understood by the aid bureaucracies.

In order for "social cohesion" to be a useful concept in preventive programming, it has to be understood at the level of communities. A community, in its most reductionist definition, simply means a body of people who have something in common. We are clearly not much interested in the world community of left-handed accountants. What we are interested in is a body of people who share a set of social institutions that connect them. A useful concept of a community requires that the group is small enough so members can somehow define their position in the network of relationships that ties the group together, so they can recognise themselves and others as being part of the group. In most cases, these characteristics imply geographical co-location. The evolution of communication technology is likely to weaken the requirement of being in the same place, however the requirement still applies to much of rural Africa. The ties that unite people—organisations, institutions, key individuals, events, customs, rituals—define them as a community, and the quality and strength of these ties determine the cohesiveness of the community.

Social cohesion thus defines a community, and cohesion is generated by community organisations and institutions. In Uganda, after more than a decade of conflict, the post-revolutionary political party and its local organisations provided much of the structure of communities. In predominately Islamic states, the local religious institutions have a strong organising influence on community processes. If we look at the communities in Africa experiencing high HIV incidence, we usually see communities that are torn apart by labour migration, inter-ethnic strife, high level of social inequality, or by a rapid decline of their economic base, and that do not have strong community organisations to promote cohesiveness. Cohesiveness is not a quantifiable parameter, but if we use a naturalistic method of enquiry, we invariably find a relationship between the relative cohesiveness of a community and the shape of its epidemiological curve of HIV. This applies to communities in Ghana who lost their traditional livelihood through the construction of the Volta River hydroelectric dam in the 1960s (Decosas, 1996), as much as it applies to the South Bronx in New York where community ties and structures were destroyed in the great American war on drugs starting in the 1970s (Drucker, 1993).

Safe sects in South Africa

Religion plays an important role in Southern African society. The level of social interaction, emotional support, and social control differs among different religions. There are many reports of communities recording lower HIV prevalence among Muslims than among non-Muslims, although this is not always the case. There are Religion plays an important role in Southern African society. The level of social interaction, emotional support and social control differs among different religions. There are many reports of communities recording lower HIV prevalence among Muslims than among non-Muslims, although this is not always the case. There are examples of the opposite. However, Muslims often differ in many other ways from non-Muslim members of their community. They may be of a different ethnic background or have a different social status, they may be the only segment of the population that practices male circumcision or and they may have closed and restricted sexual networks.

There has been a suggestion, however, that the profile of HIV epidemics differs among members of different Christian churches and sects in the same community. Gregson and colleagues reported in 1999 that members of the African Independent Church in rural Zimbabwe had a lower than expected mortality, a fact most likely related to low HIV prevalence in this group (Gregson, 1999). In the following year, Robert Garner published an anthropological study conducted in a small town in KwaZulu Natal (Garner, 2000). The study did not attract much international attention because it was not published in one of the main medical or AIDS journals and because its outcome measure was not HIV incidence but mean sexual behaviour. Nevertheless, the innovative method Garner used to measure behavioural parameters leaves little doubt that his study came as close as possible to reporting real exposure risk to sexually transmitted HIV.

The study was conducted in a township with a population of about 100,000 that is ethnically homogeneous (all Zulu) although somewhat socially stratified. 85 percent of the population is Christian. Garner studied four different churches or sects and stratified them according to four variables: The intensity of religious indoctrination, the degree of attachment of individual church members to their group, the degree to which church groups emphasised their difference from the rest of society, and the level of the groups' involvement in the life of their members, including social control and emotional support. The study found that membership in the Pentecostal Church, a group that scored highest on all four variables, was associated with significantly lower levels of extra-marital and pre-marital sex.

Whether this finding does reflect group differences in HIV incidence is not answered by the study. However, the study does indicate that in this particular environment in South Africa, membership in a sub-community characterised by greater social cohesion and control is associated with reduced probability of exposure to HIV infection.

Community HIV competence

While social cohesion at the community level or as an aggregate descriptive term at the national level is a useful analytical concept to understand a population's vulnerability to HIV, it has to be translated into an operational parameter. What are the elements that make a society or a community more cohesive and thereby less susceptible to HIV epidemics? And what can we do to promote community cohesion and reduce susceptibility to HIV? The process is analogous to the examination of community competence, a term introduced in the 1970s by the community psychiatry movement in the United States (Cotrell, 1976). Community competence describes the ability of a community to work collectively towards a common goal, it is community cohesion in action.

In the mid 1990s, the concept of community competence was taken up by a team working on health care reform and AIDS in the province of Phayao in Northern Thailand (UNAIDS, 2000). The team of Ministry of Health and UNAIDS staff started out with an essentially interventionist agenda of introducing HIV control into the process of reform of the health sector in a province severely affected by AIDS. As the work progressed, the team arrived at a more and more integrative understanding of the social and institutional context of the HIV epidemic in this particular environment. This led them to formulate the goal of an "AIDS-competent society" based on the optimal interaction of government agencies and civil society organisations. Both the Phayao model and the community psychiatry model of social or community competence rely on the way social organisations and institutions function—their goals, their reach, their inclusiveness, and their effectiveness.

This allows us to postulate some structural characteristics of an HIV competent community:

- Organisations, groups, and institutions providing social services or mutual caring, support, and assistance have an important role in the life of the community.
- These institutions enjoy wide popular support and a broad base of active community participation.
- The personnel in institutions providing services to the community has a relationship of trust and mutual respect with the population.
- Dominant community institutions, groups and organisations are committed to social justice; to overcoming inequities based on gender, ethnicity, age, and wealth.
- The community organisations and institutions have recognised and acknowledged the threat of HIV to the community and are engaged in responding to it.

There are other ways to describe community HIV competence. We could describe it on the basis of functional characteristics: How effective are the community institutions in achieving a functional response to AIDS, how much money can they raise, how well do they work together? Or we could describe it in terms of outcome: Declining incidence of HIV infection and increased quality of life of those infected.

The main point is that community competence is defined by the type of institutions that dominate the life of the community and by the way these institutions function. This is where an approach to prevention programming based on building community competence differs from the traditional, and still dominant, approach to HIV prevention in Africa. The emphasis of the Information, Education, and Communication (IEC) approach has been on the content of the message: Introducing norms and "co-ordinating" messages. Very large national programmes have been created in almost all countries to do nothing else. "Community participation" meant getting community organisations to carry the education messages to their constituencies. The "community competence" approach changes the emphasis from the content of the message to the characteristics of a community's organisations and institutions. Strong community-based organisations that are dedicated to social equity, mutual caring and support, essential social service provision, and community health promotion are the main pillars of HIV competence. They increase social cohesion and thereby reduce a population's vulnerability to HIV.

Community competence is a collective and not an individual attribute. However, the effects of increased community HIV competence are felt at the level of individuals. The results of greater competence are less HIV transmission, less isolation and stigmatisation, more care and support for people in need. The dichotomy between HIV prevention and AIDS care has disappeared, it simply does not exist at this level. Lastly, community HIV competence is not a technique that can be taught, or a service that can be delivered by a "project" or intervention. It is a quality that has to be generated from within by people working in their local institutions and organisations.

BOX 1

Youth Net and Counselling (YONECO), Zomba, Malawi

Zomba is a former capital of Malawi and its third largest city. It is a university town and the site of large police and army barracks. It is located in the Southern Region, 65 km from Blantyre. The HIV prevalence in Zomba is not known, but it is generally believed to be at least as high as in Blantyre, i.e., in the range of 25 to 30 percent among the 15 to 49 year age-group.

In 1997, the Domasi College of Education in Zomba disbanded its intra-mural HIV prevention programme because of lack of funding. A group of lecturers involved in the programme decided to continue the work, and with the assistance of local churches and participation of young people from Zomba formed YONECO. The organisation moved from the college premises to a small room in town, and for a period of about two years it conducted public awareness and public education activities for HIV prevention on a volunteer basis without any external funding.

In September 1999, YONECO received a capacity building grant from an international programme dedicated to building community HIV competence. This allowed the organisation to move to more accessible and functional premises, and to employ some essential administrative and programme staff. Almost immediately YONECO underwent a transformation from an informal group of volunteers who were only visible when they staged or participated in public events, into a widely known and respected community institution that was solicited to provide services. The local school boards approached YONECO with the request to revive the school peer education anti-AIDS clubs that had been set up some years before with international funding but that had since become dormant. By early 2001, YONECO worked in 4 of the local School Zones of the Ministry of Education, each with an average of 16 primary and secondary schools. YONECO had trained 2-4 peer educators in each school and regularly monitored, supervised, and supported the activities of the anti-AIDS clubs in these institutions.

Through its activities of organising clubs for out-of-school children, YONECO became aware that many children who were at highest risk of HIV infection were the children of sex workers who plied their trade on the periphery of the large police and army barracks in and around Zomba. This led to the development of a peer support and education programme for sex workers. By April 2001, the

programme included 60 active sex workers and distributed between 15,000 and 20,000 condoms monthly.

Meanwhile, YONECO had attracted the attention of other funding agencies and had received funds from several different sources. This allowed YONECO to move to even larger premises and to greatly expand its programme of activities to include prevention of drug abuse, environmental programming, home care, counselling, and income generating activities for people living with HIV.

Lately, YONECO has started to work with traditional authorities involved in the very secretive and prolonged sexual initiation and circumcision rites of the Yao people. The rites involve, in some instances, sexual initiation of very young girls by adult males, a practice that only recently has been cinsidered to constitute sexual abuse of children. At the same time, the rites are a potential opportunity to introduce sexual health and gender education to young boys undergoing circumcision and girls undergoing training for womanhood.

Just two years after receiving a very modest capacity development grant, YONECO has grown from a small barely known group of volunteers with no organisational budget into the primary AIDS service organisation in Zomba with an annual budget of about USD 200,000. YONECO is now known everywhere in town. The grounds of the YONECO offices are a popular meeting place for young people. The organisation is receiving numerous requests from schools, companies, local government, churches, and traditional leaders to help start programmes in response to AIDS.

The growth of YONECO is an example of the catalytic effect of providing organisational support rather than activity support to emerging community-based organisations. It also demonstrates how programmes tend to develop and expand in scope when they are being driven by community needs and demands rather than by national frameworks or external donor policies. Finally, YONECO demonstrates the concept of community HIV competence. The community of Zomba has gained in HIV competence because of the growth of YONECO within its confines. There now is a local AIDS service organisation that is well known and has a widely acknowledged presence where formerly there was none. Although a description of the community of Zomba before and after the creation of YONECO provides plausible evidence for the benefit, the question still remains what level of proof is required to be certain that the community's susceptibility to HIV and vulnerability to AIDS has really changed. The model needs validation, and the result of this validation will depend to a large extent on the mode and method of enquiry.

It is also important to note that the types of activities carried out by the members and staff of YONECO are not unique or unusual. Peer education in schools, peer action programmes among female sex workers, condom promotion, home care, self-help groups of people living with HIV, working with traditional circumcisers, these are all recognised initiatives for HIV prevention and AIDS care. The difference, however, is that these are not projects that have been imported into Zomba as part of a national strategy or an international project. Each one of these activities started in response to a felt community need, and before any external funding for the activity became available.

Validating the model

As with any complex ecological model, validation is problematic. We can pick some simple or complex indicators such as HIV incidence or quality of life of people living with HIV and follow them over time. We will see them change, but there is no baseline information to tell us whether strengthening community organisations and institutions had any part in this change, positive or negative. We can compare a number of communities in an experimental or pseudo-experimental research design, but we will always end up with a comparison of small numbers. Even if we could compare the HIV incidence in 10 or 20 communities the sample would still be small and there would be many questions about how to weigh and adjust a large number of exposure factors specific to each environment, and how to account for complex interactions between factors. For instance, is violence in a community a cause for low community cohesion and does it therefore affect HIV incidence? Or are violence and HIV epidemics co-morbid events triggered by lack of community cohesion? The answers to both question is probably "yes," but how much weight do you assign to each of the opposing vectors in the causal model?

More than ten years ago, in a conference on research methods for health promotion, McKinlay summed up the dilemma. "The current approach to solving health problems and to evaluating intervention efforts centres around change at the individual level. But there are serious problems with

this approach which raise concern about the wisdom of continuing along the traditional path" (McKinlay, 1992).

One of the problems is related to the presentation and interpretation of data. In 1994, a classic intervention study was published of a comprehensive programme of condom promotion, health care, and peer support among a group of female sex workers in the Matonge area of Kinshasa (Laga et al., 1994). It was the first published evidence that such a programme could result in decreasing HIV incidence, and it became the reference for many interventions targeting sex workers. In its presentation, the study focused on individual women, analysing the association between condom use, clinic attendance, frequency of STD episodes, and HIV incidence. While the study demonstrated an association between these factors, it missed one important point: The women who were most engaged in the community of this study "cohort" were the ones who visited the clinic regularly, who used condoms more consistently, and who ultimately had better health outcomes. The cohort was not some abstract concept of randomly selected women. The cohort members were part of a community and readily identified themselves as such. In the early 1990s, many sex workers in Kinshasa would tell you with considerable pride that they were "with the Matonge clinic."

In 1994 it was still important to show that STD treatment and condom use prevented HIV transmission. But below the statistical analysis of individual risks hides the information that community-building among sex workers results in lower HIV incidence. This is mediated by behavioural factors such as more consistent condom use and more appropriate health care seeking. Unfortunately, the interpretation of the study results stops at the level of these factors. The reason is obvious: The unit of analysis for the effect of community-building is the group of sex workers, i.e., there is a sample of one. The unit of analysis for the behavioural factors are individual sex workers, i.e., the sample is as large as the group. You cannot do statistical tests on a sample of one and you cannot publish a scientific article that traces the effect of a single community intervention over time without using comparisons and controls. We therefore loose an important piece of information simply because of current conventions of what is publishable scientific evidence.

Research methods that actually can show the benefits of increasing community HIV competence do not have the same level of scientific prestige as quantitative surveys, and are often ignored. Qualitative or descriptive studies, repeated in-depth community analysis, and ecological studies comparing populations in different geographic locations are powerful tools to capture changes in the social environment. These studies can be supported by evidence collected in more traditional quantitative surveys and experiments. They provide the core of understanding what is happening to communities and why. Just because these types of studies do not deal with big sample sizes and statistical tests does not make them second-rate science.

If we critically re-examine existing data and information, we can find strong evidence that community cohesion is the main social parameter determining a population's incidence of HIV infection. We also have evidence from many other sources that community cohesion is increased when there are strong community-owned organisations. What remains to be validated is the link between the activity of strengthening community cohesion and the epidemiological impact on HIV. This will require long-term follow-up by appropriate programmes.

Changing the HIV risk of communities

We are currently hearing more and more pronouncements that prevention of HIV in Africa has "failed" (e.g., Farmer et al., 2001). The cited evidence are the high HIV prevalence rates recorded in East and Southern Africa despite 15 years of preventive programming. In fact, HIV prevention has probably been quite effective. It has concentrated on individual risk factors and has targeted behaviours and individuals at highest risk. Using the image of the graph in Figure 2, it has worked in the grey-shaded area and likely prevented many HIV infections. The graph shows hypothetical risk profiles of two populations. Population A is a community with very little vulnerability to HIV, and a low level of HIV incidence. Population B represents the risk profile of a highly vulnerable population with high HIV incidence.

Working in the grey shaded "tail" of the risk curve is necessary, even essential. There have been, and still are many effective programmes that have prevented a large number of HIV infections. The approach is based on a model developed for STD control, targeting core transmitters as a population health strategy. HIV infection is sexually transmitted and the model is therefore appropriate. However, because HIV is such a poorly transmissible virus, factors that facilitate transmission are much more

important in determining the population incidence than numbers of sexual contacts. There are many of these factors, they range from the biological to the economic, and they interact with one another. This is why the epidemiology of HIV resembles the epidemiology of chronic diseases such as heart disease as much as it resembles the epidemiology of gonorrhoea.

A similar graph as in Figure 2 can be found in the chronic disease section of any textbook of public health. From the study of heart disease, we know that the main impact on the population incidence is not achieved by identifying the high risk individuals and treating them with cholesterol lowering agents. The impact requires a shift in the mean risk profile of populations. Placing a bottle of olive oil on the table of everyone with an abnormal cardiogram will have no effect, but societies with a "Mediterranean diet" have significantly lower incidence of heart disease. Similarly, lowering the population incidence of HIV requires a shift in the mean risk profile of communities as indicated by the arrow in Figure 2. This applies particularly in a mature epidemic with a high level of HIV endemicity as we are currently experiencing in Southern Africa (Decosas and Padian, 2001). This does not mean, of course, that we should stop paying attention to the core groups in the high-risk tail of the distribution curve. We do not stop treating people for hypertension just because we have found that more benefit at the population level would be achieved by lowering the mean diastolic pressure of the community.

The "success" of Uganda is due to such a shift in the risk profile. It was not, or at least not solely, brought about by a number of individual prevention programmes. In fact, some of these programmes, as for instance condom promotion, did very poorly in comparison to other countries. The shift was brought about by a societal change at the community level. This change, which is best described as an increase in HIV competence, is characterised by an increase in social cohesion. Similar changes can be found in many communities all over Africa, and they can be promoted through appropriate public policy and programming. Strengthening community organisations to create greater community cohesiveness is one approach to shifting the risk profile of a population. The rationale and the approach are based on an ecological analysis of HIV epidemics in Africa.

Conclusion

The ideas and concepts presented in this paper are not new nor are they complex. Intuitively, we all know that people who live in supportive and caring social environments are healthier than people who do not. Our social environment has an impact on our health.

Unfortunately, this knowledge has hardly ever been translated into the way we analyse and respond to epidemics of AIDS. The huge international HIV research and intervention industry has effectively shielded itself from social analysis and from social theory. Even today, when under the battle-cry of the "multi-sector response," the walls of one dimensional AIDS programmes are said to be crumbling, we often do not go beyond attempts of converting competent agricultural extension workers into incompetent condom salesmen.

If we are really serious about recognising the social dimension of AIDS, then we have to recognise that the way communities feed themselves, the way they earn their living, the way they pray together, the way they look after their children and their elderly, the way they care for their sick, the way they govern themselves, and the way they critically examine the interventions of development agencies are all determinants of how they experience HIV and how they cope with AIDS.

Analysing the social ecology of AIDS at the level of communities should liberate us from the practice of formula feeding the latest international fad to people who have their own priorities and problems, and who are often too polite to say so. This approach apparently has not had much impact on the evolution of HIV epidemics in Africa.

Figure 1: The prevalence of HIV among pregnant women in four locations in Africa

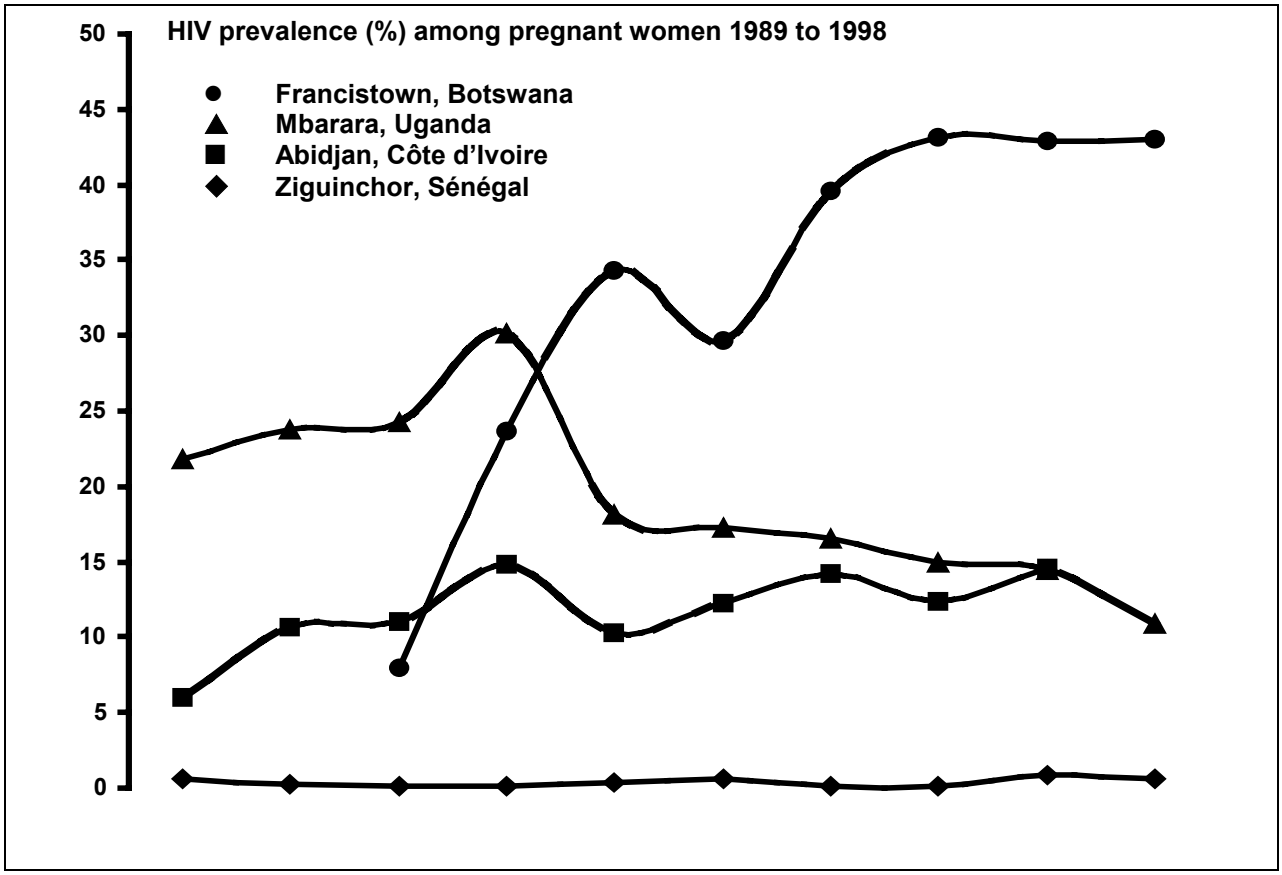
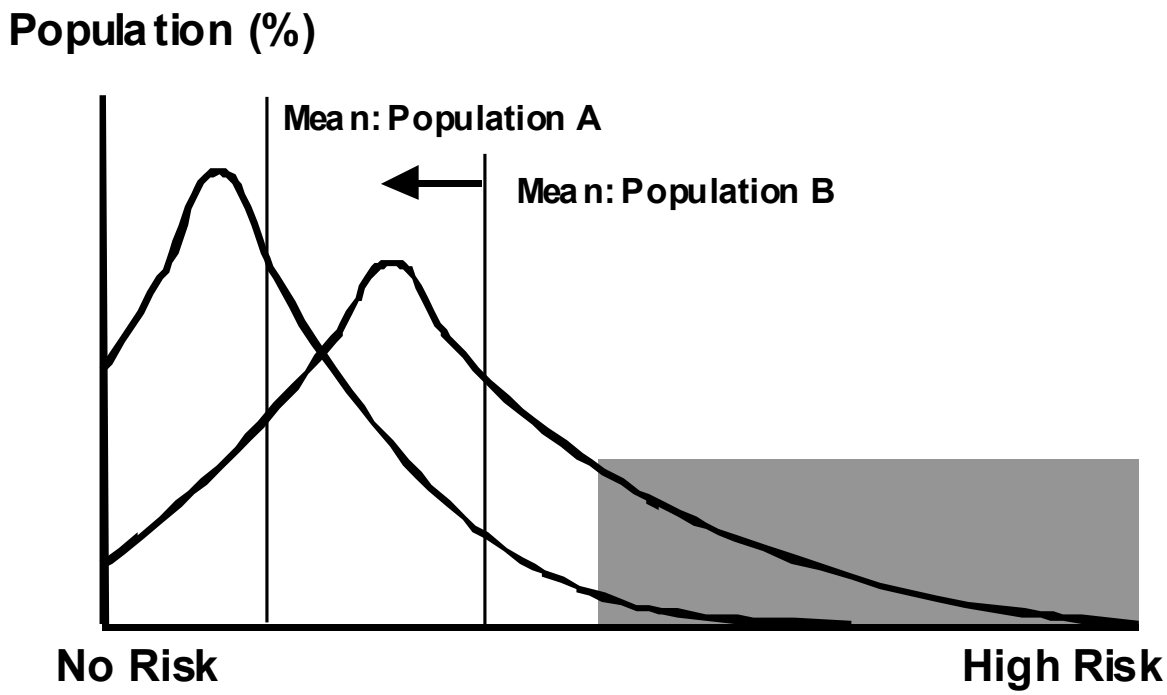


Figure 2: Distribution of individual risks for contracting an HIV infection in two hypothetical populations



(See text for explanation*) The figure is related to the section "Changing the HIV risk of populations" It should probably be inserted somewhere within this chapter.* ***[Joseph: Where in text? Refer readers to page number?]***

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