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Unimagined community: sex, networks and AIDS in Uganda and South Africa

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THE SOCIAL DETERMINANTS OF SEXUAL NETWORK CONFIGURATION IN UGANDA AND SOUTH AFRICA

EXPLAINING THE DIFFERENCES:

We have seen that the different configurations of large scale sexual networks—in particular, their self-organising behaviour due to structural characteristics—is the primary factor in the radical differences between HIV prevalence trends in Uganda and South Africa. I turn now to consider the social-structural causes for these differences in the configuration of the sexual networks. Rather than seek explanation at the level of individual choice and behaviour—what is usual in epidemiological studies— we look for explanation at the same scale of analysis, that is, at the social level. Indeed, differences between the two countries in statistical aggregates of individual sexual behaviour based on surveys—that is, the so called 'ABC' factors—are much less than the empirical differences in HIV prevalence. Differences between Ugandan and South African political and social structures are, however, quite large.

Comparisons that neglect the larger differences in social structure in favour of the small differences in sexual behaviour appear confounded. For example, one group of leading researchers working in Uganda noted in 2006 that

> although HIV prevalence declined in 1990s, we cannot disaggregate the contributions of specific behavioural change (abstinence, monogamy, condom use), postwar social stabilization, the direct effects of government prevention programs, and the natural evolution of the epidemic (i.e., declines in prevalence due to mortality exceeding incidence, and declines in transmission as fewer people were in the early, highly infectious, stages of disease).[1]

The problem here is that while all of these factors certainly had impacts, the statistical methods that have been used do not allow them to be 'disaggregated'.[2] Statistical methods do show, however, that none of them, either singly or together *can fully account for the rapidity of the decline*. By taking a larger 'ecological' or systemic view, we can see that this remarkable fact was a property of the entire sexual network, itself part of (or, a 'sample' of) the entire social network. This allows us to examine the social-structural features of Ugandan and South African societies in order to show how other social factors shaped the sexual network and, in the case of Uganda, caused its collapse.

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[1] Gray, Serwadda, Kigozi, Nalugoda, & Wawer 2006.

[2] This is primarily because statistical methods (and the epidemiological methods that are based on them) assume that HIV prevalence is a function of one or some set of the identified variables ('abstinence', 'condom use' etc.), and that these can be measured within reasonable limits on error. We assume that these variables are independent and can therefore be separated from each other by mathematical methods. We also have to assume that probabilities are distributed normally, that is according to a Gaussian or Weibull distribution. None of these assumptions, however, is necessarily valid.

In fact, differences in knowledge about HIV, education campaigns, and aggregate statistics of sexual behaviour and behaviour change are also not as helpful as we might expect in explaining the differences. Both countries have implemented extremely extensive educational campaigns with over 90% of the populations being aware of AIDS and how to prevent it.[3] Both have provided condoms free of charge or cheaply to large numbers of people,[4] and intervened in numerous other ways with significant involvement of all aspects and levels of government and civil society (with the exception of the President and the Minister of Health in South Africa). Surveys show, too, that sexual behaviour has changed by similar amounts in both countries.[5] Moreover, statistical aggregates of sexual behaviour data show that Uganda and South Africa are not abnormal compared with countries in the rest of the world.[6] It has proved extremely difficult to evaluate the effect that knowledge, sexual attitudes and beliefs have on sexual behaviour, and the effectiveness of condoms has also been difficult to assess. A large and comprehensive meta-study of global trends in sexual behaviour published in *The Lancet* (November 2006), remarked that

> … the apparent absence of an association between regional variations in sexual behaviour and in sexual-health status [HIV and STI prevalence, etc.] might also be counterintuitive. In particular, the comparatively high prevalence of multiple partnerships in developed countries, compared with parts of the world with far higher rates of sexually transmitted infections and HIV, such as African countries, might hold some surprises.[7]

Thus, it appears unlikely that much of the *difference* in the shape and direction of HIV trends between the two countries can be successfully attributed to this set of factors. The differences remain puzzling even after years of research and analysis.

As we have seen, prevalence trends, especially in Uganda, do not conform to expected, standard demographic growth or logistic curves, or to standard epidemiological models based on these. Stoneburner and Low-Beer's attempt to fit an epidemiological model to the data,[8] they had to assume an extremely rapid—and unrealistic—drop in incidence between 1989 and 1994. More problematic is the fact that the simulation predicts further rapid falls in prevalence after 2000. This would conform to normal viral epidemics in which the viral infection eventually falls to near zero as patient recovery, increasing population-level immunity and possibly death raise the epidemiological threshold to a point at which the virus can no longer propagate. This evidently does not happen in HIV epidemics. Instead, judging from current evidence, HIV prevalence may stabilise, and may continue to decrease, but does *not trend towards zero*. This is consistent with a power law model that successfully models this fact, but is not consistent with standard epidemiological curves that are based on Gaussian 'bell-curve' or exponential models.

Thus, the behaviour of the curves describing increases and decreases of HIV at the population level suggests that the configuration of the sexual network is a causal element in prevalence trends over time. This is because HIV transmission is not randomised as aerosol transmission of

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[3] Demographic and Health Survey, South Africa, 1998 (Measure DHS 1998).

[4] Dorrington, Bradshaw & Budlender, 2002; Kirby 2004.

[5] Konde-Lule, Musagara & Musgrave 1993; Hogle, Green, Nantulya et al. 2002; Stoneburner and Low-Beer 2004; South African Institute of Race Relations 2002; Wellings, Collumbien, Slaymaker, Singh, Hodges, Patel, & Bajos 2006..

[6] Wellings, Collumbien, Slaymaker, Singh, Hodges, Patel, & Bajos 2006.

[7] Wellings, Collumbien, Slaymaker, Singh, Hodges, Patel, & Bajos 2006.

[8] Stoneburner and Low-Beer 2004: 717, figure 3(A); see chapter 2 for a fuller discussion of this.

flu or cold viruses generally are. It is therefore difficult to explain these differences on the basis of statistically randomised survey data on sexual behaviour and behaviour change, or by using ordinary epidemiological methods alone.

In mature, generalised, heterosexual HIV epidemics such as these, many factors affect choice of sexual partners and the frequency and periodicity of sexual contact. Accordingly, these networks can take on different configurations. These configurations have different properties with respect to the efficiency of transmission of the virus, and their vulnerability to interruption or breakage.[9] Where networks break, through any form of limitation or cessation of sexual activity or use of a barrier (condom), HIV transmission is interrupted, and therefore further incidence of HIV infection hindered. The overall effect that different degrees of such interruption will have on efficiency of transmission in the overall network, however, *is a property of the configuration of the entire network, not simply of the statistical frequency of interruptions* (that is overall sum of numbers of broken links, or non-transmitting nodes). In other words, the magnitude of behaviour change—use of condoms, changes in number and frequency of partners—affects HIV prevalence differently depending on the specific architecture of sexual networks.

This observation shifts attention away from personal sexual *behaviour* to the level of the *social*—specifically to social and sexual networks. It forces a shift in the scale of observation and suggests that interventions that fail to take into account the *configuration of the overall sexual network* are likely to have limited or unpredictable effects … or no effect at all. Since the only measures we have for describing and predicting the development and future trajectory of the epidemic are 'behavioural', it is not surprising that we are still searching for answers after more than twenty years.

SEXUAL NETWORKS, FAMILY STRUCTURE AND PROPERTY

Notable efforts have been made to develop historical, cultural, political and sociological explanations for the characteristics and magnitude of the epidemic in Africa.[10] It is clear, first of all, that there have been significant differences in the way that the state has responded, and in the type and level of civil society involvement.

Uganda had exemplary leadership from President Yoweri Museveni and from his government in general in the fight against AIDS, while South Africa has had very little central leadership, or leadership that has tended to be harmful. Civil society involvement has been more or less total in Uganda, with tight integration between government and elements of civil society such as churches, NGOs, donors, business associations, labour associations, traditional authorities and traditional healers, schools, and community based organisations, among others.[11] In South Africa, this has not been the case. While there is large involvement of civil society organisations, it is fragmentary, competitive and quarrelsome. The relation between activist organisations concerned with AIDS and government has also been characterised by conflict and distrust. Political factors, however, do not entirely explain the different configurations of the trends or their directions.[12]

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[9] Wohlfeiler & Potterat 2003.

[10] Caldwell, Caldwell & Quiggin 1989; Caldwell, Caldwell & Quiggin 1991; Caldwell, Caldwell & Orubuloye 1992; Barnett & Whiteside 2002; Gray, Serwadda, Kigozi, Nalugoda, & Wawer 2006; Green, Halperin, Nantulya, & Hogle 2006.

[11] Thornton 2003b; Parkhurst & Lush 2004; Kirby, 2004.

[12] Barnett and Whiteside 2002:295–306.

Cultural and social factors strongly influence the choice of sexual partners, as well as the number of sexual contacts and their periodicity and determine the degree or level of social control that social groups such as family/clan or church or 'peers' might have on sexual behaviour of their members. The effectiveness of these controls is often determined by other factors again, especially the presence or absence of potentials for coercive violence, and the presence or absence of heritable fixed property that can be used to discipline sexual (or other behaviour) by withholding inheritance or access to it.[13] In both Uganda and South Africa only very limited coercive pressure of this type is exercised within local or domestic groups and it appears that coercive violence is not an effective means of sexual control. Use of controlled violence, from beatings to community-sanctioned murder, primarily occurs in strongly patriarchal[14] societies, such as rural Islamic villages from the Middle East to Pakistan and India where property-owning corporate kin groups exist and are strongly sanctioned by the community. Where it does occur, sexual behaviour is strongly associated with family honour, and families are corporate property holding groupings with enduring systems of political conflict and alliances between other and all such family-property corporations. In other words, sexual behaviour is never the only thing at stake. Such community-sanctioned coercion occurs to a very limited extent in Uganda and not at all in South Africa. While there is a very high level of violence against women in South Africa, there is no indication that violence occurs as the result of community-sanctioned disciplining of women for shaming or bringing dishonour to families or to the community as the result of their sexual behaviour. 'Shame' and 'honour', as these concepts exist in, for instance, circum-Mediterranean societies, are essentially absent in both Uganda and South Africa. By contrast, concepts of 'respect' and 'jealousy', supported by witchcraft beliefs and networks of gossip and influence are far more important. Almost universally, violence against women is locally attributed to 'jealousy', to drug or alcohol abuse, or to 'people getting out of control'. Except in the few cases in which 'witches' are punished such violence is never sanctioned by families or communities.

One significant area of difference between the two countries is the fact that most Ugandans are closely tied to kin group, 'clan', or ethnic identities and these, in turn are closely associated with property ownership. By contrast, most of the present South African land was variously alienated from black African ownership by the South African state, and few South Africans own any land outright as heritable property. Even white South Africans, who are more likely to have title to land and houses, generally have heavy debt burdens and few transfer property through inheritance. Very few non-white people have any free-hold tenure land that can be inherited.[15]

The existence of heritable land in Uganda gives kin groups significant control over their members, especially by senior, especially male, members over the junior members. In Uganda, too, property is usually inherited, or otherwise transferred to juniors only on the death of senior members of the family, clan or lineage. In Uganda, this control is exercised in a number of ways over junior men and women, and probably represents a significant system of social control over sexual behaviour. Moreover, those who die from AIDS (or any other cause) cannot inherit property or pass it on to family or children. This seems to represent a powerful deterrent. While it evidently does not limit the overall 'volume' of sexual activity, it probably limits the range of persons with whom one can and does have sex.

In South Africa, on the other hand, family property is extremely limited for the vast majority. It is also rarely transferred as inheritance to junior generations. While property transfer does

[13] Goody 1976; Caldwell, Caldwell & Quiggin 1989.

[14] Weber 1979; Goody 1976.

[15] Cronje 2005.

occur, it is generally transferred at the time of marriage through the institution of 'bride price', in which the husband's family gives a relatively significant amount of 'cattle' (today, usually in the form of cash or other goods) to the family of the bride. Other gifts are exchanged in the opposite direction as well, but the bulk of wealth is transferred from the groom's to the bride's family. This represents a 'horizontal' exchange of wealth almost always in currency or moveable property, symbolised by the traditional 'cattle' in which it is counted. The absence of fixed and real property-holding family corporations in South Africa means that kin have almost no control over other members of their group. By contrast, in Uganda senior kin control wealth that is passed only on their death. This means that they are more likely to have control over the sexual activity and other behaviour of their younger kin. Bride-price is also customary in much of Uganda, but the property (cattle, money, and other goods) that is exchanged, is exchanged by corporate kin groups. This explains the custom of 'wife sharing' in western Uganda, for instance, because the bride-price is raised jointly by all members of the family who then have joint sexual rights as a consequence. In South Africa, bride-price is raised and paid by the groom, possibly with help from his family, but they do not claim joint corporate rights. In Uganda, these patterns lead to clusters of sexual relations (joint family access to the new bride) and support the family property complex, while in South Africa, there is no family property complex, and bride-wealth is primarily the responsibility of the individual.

The history of Ugandan land-tenure arrangements is centuries long, but since the early nineteenth century, the conquest of most of the southern part of this country by the centralised kingdom of Buganda (from which the country gets its name), has established and stabilised strong association between kin groups and specific lands, termed '*mailo*' from the English term 'mile', the unit in which land-holding is measured.[16] Under the laws of the British Protectorate, some pre-colonial land-holding arrangements were preserved and only small amounts of urban lands were alienated to European or Asian (Indian) settlers. The small amount of land owned by settler groups (predominately Indian) or foreigners was commandeered under Idi Amin's government, although some of this has been returned since Yoweri Museveni took power. In the main, land tenure arrangements dating back to the nineteenth century have endured until today. Most of the land is owned by corporate kin groups of one sort or another; all of it is heritable, and is inherited.

In South Africa, land tenure regimes allow very little scope for free-hold title to land. Out of a total land area of 1·22 bn hectares, 86·2 m (85·6%) of this is surveyed 'farms', large tracts of land that are owned by one legal person.[17] While the state owns some of this land, 46,000 private owners, or 0·1% of the population, own most of this land.[18] The remaining 14·5 m hectares of agricultural land is predominately 'communal land' in the old 'Homelands', areas designated for exclusive settlement by black African people under Apartheid up to 1994.[19] Private ownership in these areas is a rarity. Most of the 'non-agricultural land', comprising 21·6 m hectares lies in nature reserves, state lands, or is owned by Public Works.[20] Overall, the state owns 27 m hectares. Thus, there is very little scope for ownership of private real property.

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[16] Reid 2002; Roberts 1962.

[17] South African Institute of Race Relations 2003: 376.

[18] South African Institute of Race Relations 2005. The owners of these 'farms' are often corporations or companies.

[19] South African Institute of Race Relations 2003: 376.

[20] South African Institute of Race Relations 2003: 376–378.

As a consequence of this, Ugandan and South African kinship structures and household formation, including levels of control attached to these, are radically different.

SEXUAL NETWORKS AND FAMILY PROPERTY REGIMES

We can now explain the effect of different configurations of sexual networks on the dynamics of the HIV/AIDS epidemic in terms of different family-property regimes.

Depending on the kinds of choices people make about sexual partners, the network can take on different 'shapes' and cover different populations. For instance, if one highly sexually active person is having sex with ten people regularly (for example, a 'sugar daddy/mama'), and each of his/her partners is having sex with two others, then we have a wheel-and-spoke shaped network where one person is linked to many people, and those people linked to fewer people. Several such interlinked networks can form a densely linked cluster with relatively few links outwards. Alternatively, we might have large numbers of people in a population linked to two, three or four people; all have multiple links to others through 'circles', chains or filaments of sexual contact that ramify widely. This forms a 'randomised' or 'small-world' type of network, with many possible links between most people in the network.[21]

The clustered sub-network will be relatively isolated from the rest of the population if none or only a few people have sex with people outside of that network. The clustered network will be less efficient in transmitting HIV to a larger population, but highly efficient *within* the clusters if core people have the virus. On the other hand, the randomised 'small-world' network will be highly efficient at transmitting the virus to ALL of the population since there are many possible links across all possible participants in the network. For the small-world networks, it does not matter where the virus is first introduced, since it will spread to all parts of the network very efficiently.

This has implications for HIV/AIDS transmission. For clustered, 'lumpy' networks, if the links between clusters are cut, the HI virus will be isolated within different sub-networks, and will not be able to spread beyond that. A phase transition—as in Uganda—will occur in HIV incidence and prevalence when a tipping point is reached. If one or two critical links are eliminated—they stop having sex, start using condoms, stick to one partner or die—then prevalence in the whole population will decrease very rapidly. For the 'small-world' network, if a few links are eliminated, there will be NO EFFECT AT ALL on the entire network since the network will function like the Internet, that is, even though some links go down, the network as a whole continues to function. In the case of HIV, so long as most people have multiple partners at regular intervals, the elimination of some people ('links') will have no effect on the efficiency of transmission through the entire network since all persons are multiply linked to other parts of the network. Thus, small, or even quite large changes in sexual behaviour will have little appreciable effect.

Uganda

It appears that Uganda's sexual networks were probably highly clustered with limited links between clusters. This is caused—or supported—by a number of factors that affect social differentiation.

First of all, Uganda has a relatively large degree of social differentiation in a relatively small population (23 million people as opposed to 45+ million in South Africa), with class and status

[21] Buchanan 2002; Strogatz 2003; Barabási 2002.

differentials[22] that are partly founded in the hierarchy of the southern kingdoms, partly on wealth in land, and partly on other criteria such as position in government. The distinctions are deeply rooted in history, since the origins of the largest states of Rwanda, Bunyoro, and Buganda can be clearly traced back five centuries or more. These differences are both 'ethnic' and political, since each kingdom was a distinct political entity in pre-colonial and colonial times. Many Ugandans continue to think of themselves as separate polities even today, especially since the restoration of their kings by Museveni. I was struck, for instance, by the fact that when I visited Rubaga Girls School where I used to teach in the early 1970s, the flag of Buganda, the newly restored kingdom, was raised before and next to the Ugandan national flag on the open day I attended. Rubaga is next to the first Roman Catholic cathedral in Uganda, and adjacent to the old Lubiri or King's Palace. It lies at the heart of old Buganda. But each kingdom also has its own history of different tribes and languages, and they are ranked with respect to each other's history of conquest and incorporation. Inequalities exist both within and between these social divisions, as well as between virtually all individuals. Jacques Maquet termed this 'the premise of inequality' with reference to this set of kingdoms and their political structures.[23] Another anthropologist writing about the oldest of these kingdoms, the Nyoro, noted that 'ideas of superordination and subordination' were pervasive in social life such that 'every social relationship has … a hierarchical or "unequal" aspect.[24] These authors were writing in the middle of the twentieth century when such broad generalisations were possible, but the essence of their observations rings true to anyone who has become familiar with Uganda. This means that *within* these ethnic groups there are significant degrees of status difference that inhibit sexual contact across these barriers. They also inhibit sexual contact across these divisions.

While the official national language in Uganda is English, there are significant ethnic and linguistic division, too. Ethnically, Uganda divides roughly into northern and southern halves. The southern half is dominated by the Kingdom of Buganda, but includes three other kingdoms—Toro, Bunyoro, and Ankole—together with other 'tribes' or ethnic groups such as the BaSoga, BaGisu, BaChiga who were politically organised with distinct historical identities but lacked kings in the pre-colonial period. All of the people in the southern half speak one or another language of the Bantu family of languages, with LuGanda being the largest of these. Most of these are not mutually intelligible. In the north, people speak languages that are not related to the Bantu languages of the south, but rather to the Sudanic and Nilotic ('Sudan-' and 'Nile-languages') to the north of Uganda. These groups did not have kings and were not centrally organised into states as most of the people in the south were. The Madi, Alur, Lugbara, Langi and Iteso in the central part of the north were primarily agriculturalists, while the Karimojong, and Jie, in the dry northeast relied on cattle herds and on dry-land sorghum crops for subsistence. In most of Uganda's cities and towns, one language or ethnic group dominates, but none of them are ethnically or linguistically exclusive. In more rural areas, by far the majority of people live in mono-lingual communities. Linguistic differences, like political, ethnic and status differences also tend to create sexually endogamous groupings. One recent study, for instance, found that unmarried women and married men in multi-lingual communities were far more likely to engage in extramarital and multiple partnerships than those in mono-lingual communities.[25] While this did not appear to hold true for married

[22] Fallers 1964: 64-117.

[23] Maquet 1961.

[24] Beattie 1971: 7.

[25] Bishai, Patil, Pariyo &Hill (2006) find 'a robust association between residing in rural Ugandan communities where multiple languages are spoken and the odds of non-spousal sex for unmarried women and for married men.'

women or unmarried men, it does suggest, at least, that language differences structure the sexual network in specific ways.

The kingdoms were all abolished in 1967 by Milton Obote, a Langi from the north, who then declared Uganda a Republic. The southern kingdoms, with the exception of Ankole,[26] were re-established by Yoweri Museveni after he took power in 1986. Especially in the south, there were strong status differences between the political elites of the kingdom, and between the 'high status' cattle keepers (part of the larger 'Tutsi' ethnic category) such as the BaHima (Museveni's ethnic group) and the BaIru ('servants'), agriculturalists. Other clearly differentiated status groups in the nineteenth century included fishermen, hunters, blacksmiths, bark-cloth workers, and so on. Important status distinction are still made today based on the pre-colonial histories of clans associated with these pursuits, in addition to other, newer status differences based on profession, political party membership, rural/urban distinctions, among others. Finally, all of these differences are cross-cut by religious affiliation. The vast majority of Ugandans belong to one of three faith communities: the Roman Catholic, the Church of Uganda (Anglican Communion) and Islam. Evangelical Christians, primarily funded by Christian fundamentalists from the USA, have greatly increased their numbers in recent years, too. These distinctions, while not apparent everywhere, tend to divide the Ugandan population into relatively small endogamous (and sexually exclusive) groups based on economic, ethnic and status factors. Most social interaction, especially ties of close friendship or sexual intimacy, tends to take place within these groups rather than across them.

The relatively high prevalence of polygyny is another factor that contributes to the clustered configuration of the Ugandan sexual networks. The Demographic and Health Survey of 2001 shows that 21·8% of all married women reported that their husbands have at least one other wife, while 10·4% reported two or more co-wives.[27] The polygynous family is the simplest and clearest example of a hub-centred network or cluster. This consists of a husband married to several wives that each has their own household establishment and children. In fact, the wives may also have other lovers, and the husband is not necessarily faithful to only those wives that he is married to. The idea that one should be limited to even several wives seemed surprising to one Muslim man that I spoke with in July 2003. 'If I stayed with only the wives I have' he said, 'how would I find another wife?' he asked. This pattern is relatively common. In some cases, informal or effective polyandry around a wealthy 'sugar mama' such as a female professional or trader, or 'wife sharing' as attested for Western Uganda among a group of brothers whose family wealth in cattle have been exchanged for a wife, was also practiced.

Clan or kin-group organisations are another factor that governs sexual access. Rules of kinship and marriage, and of rituals pertaining to life crises such as circumcision, death, and marriage both permit (or require) or forbid sex at different times. For instance at family funerals, there is often a period of informal sexual license associated with large funeral gatherings. Like any large gathering, these occasions also provide moments of sexual opportunity. During circumcision ceremonies in Eastern Uganda periods of sexual license often prevailed. Wife-

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Specifically, they found that 'for unmarried women rates of sexual activity were significantly higher, 26% in multilingual compared to 13% in monolingual clusters ($Z=3.01$, $p < 0.01$). But rates of extramarital contact were significantly higher for married men with 29% in multilingual clusters compared to 16% in monolingual clusters ($Z = 3.59$, $p < 0.01$).' Men had from 4 to 20 extramarital partners in these multi-linguistic communities, while sexually active unmarried women reported from 3 to 5 partners in the previous 12 months.

[26] Museveni believed that the restoration of the Ankole kingdom was likely to lead to conflict and possible bloodshed since its ethnic and political structure is similar to that of Rwanda and Burundi. As a result, the Ankole kingdom was not restored.

[27] Measure DHS 2002: 75.

inheritance is another instance in which sexual activity is regulated by rules of kinship and family/clan tradition. Traditionally, in most of the southern kingdoms (as in the Bantu-speaking areas of Africa), the surviving brother of a deceased man was expected to marry his brother's widow. If the deceased had died of AIDS, it is likely that the surviving widow was also HIV-positive, and this custom is believed to have led to increasing rates of infection. These practices appear to have changed radically in the early 1990s. It is very likely that these changes contributed to the sudden 'phase transition', or 'catastrophe event' that occurred in the HIV-prevalence rates in 1992, as shown in the previous chapter.

Most people in Uganda are linked through kin networks to heritable property, thus giving senior family members some degree of control over juniors. This pattern is based on the political structures of the old kingdoms in the south, and on the clan-based land-tenure systems of the agricultural chiefdoms of the north. In the kingdom of Buganda, for instance, the clan chiefs, the *Abataka*, held clan lands on behalf of the members of the clans. At the end of the 19th century, there were approximately 50 such clans in Buganda with clan land holdings. Their names and symbols (or totems) are memorialised today in the foyer of the Bunga, the seat of Ganda King, or Kabaka, and his council (see Figure 3.1). For much of the history of the kingdom, the *abataka* competed with the 'king's men', the hierarchy of the king's own men, who as leaders of the army or providers of other services to the Kingship, were also entitled to land, especially conquered lands. The king's men, then, constituted another group of land-holders who derived their position originally from the kingship during the expansion of the Ganda kingdom, but who became, with their descendants, holders of free-hold tenure land. The system of land tenure was confirmed and legalised by the installation of the British Protectorate, and protected from expropriation by non-Ugandan settlers. Thus, the system of land tenure in Uganda is based on free-hold tenure, originally by clan heads and elites, but now devolved to family units. Unlike South Africa, Uganda's system of land tenure, and therefore of property and kinship has been relatively stable for over a century. Similar arrangements exist in Toro, Bunyoro, and Ankole, the other principal kingdoms of Uganda. In the north, traditional local-level land tenure systems have remained largely unchanged due to the relative isolation of this part of the country. Because Ugandans own and inherit land, the moral pressure of families remains strong.



Figure 3.1. The *Bunga* or Buganda King's Council building, in Mmengo, where the *Lukiiko* (King's Council) is housed. Mmengo today is a suburb of Kampala, Uganda. (Photograph: R. Thornton)

Since Uganda was never colonised, but remained a British Protectorate from the late nineteenth century until independence, traditional systems of authority based on kingship and chiefship have been relatively stable over a period of centuries, and are strongly linked to systems of land tenure. As noted above, the systems of land tenure have also remained stable. 'Most people's cultural patterns are constructed around land relations', a Ugandan sociologist, Mukyala-Makiika, notes.[28] In 2003, for instance, the Kabaka ceded the residence of the former *Katikkiro*, Prime Minister of Buganda, to the Uganda government to house the Joint Clinic Research Program, the leading HIV clinical research centre in Uganda. Many Ganda people, especially royalists, objected to this because of the strong link between land and kingship. The move was justified by the Kabaka as being in the national interest. This and other compromises and collaborations have enabled traditional systems of authority to become involved in AIDS prevention. Contemporary Uganda has—so far—successfully integrated these institutions into civil society and into the massive mobilisation of civil society in response to AIDS.

Close co-operation has not always been the case, or even possible. After the previous president, in collaboration with his then military chief, Ida Amin Dada abolished the kingships and all traditional leadership positions in 1967, resentment continued to simmer, especially amongst the traditionalist Baganda of the Kabakka Yekka (KY, 'Kabaka Only') party, but also amongst other Ganda conservatives and in the smaller kingdoms. Responding in part to several strong social movements that demanded ethnic and communal rights which only the restoration of the kingships could provide, Museveni restored all but one of these, Ankole, in 1993.[29] The 1995

[28] Mukyala-Mukiika 2000:105.

[29] The Kingdom of Ankole is the sole exception. President Museveni felt that the traditional social structure of this kingdom, with its racial/ethnic hierarchy of BaHima and BaIru was too similar to that of Rwanda and Burundi to be allowed to reconstitute itself. Conflict between people labelled 'Tutsi' (linked to the BaHima in Ankole) and those labelled 'Hutu' (linked to the BaIru in Ankole) has led to extreme bloodshed in Rwanda and Burundi in the past, and Museveni intended to avoid this in Uganda. Doornbos notes that 'Particularly to Buganda where the idea

constitution further entrenched the 'cultural rights' of these kingdoms.[30] The Museveni government believed that because of their popular legitimacy, they would be strong stabilising agents, especially at the local level. This move was coupled to the implementation of a decentralisation policy that shifted many of the functions of government to culturally homogeneous local councils and committees. While conducting research in Uganda in 2003, it was clear to me that these local committees were effective and active. They helped to select a good cross-section of their communities for interviews and focus groups on AIDS and HIV in the several cities that we visited, including Kampala, Mbarara in the southwest, and Mbale in the southeast. It was also clear that people, especially in Kampala and Mmengo, the heart of the Ganda kingdom, were profoundly respectful of the king and the kingdom. At Rubaga Girls School, a Roman Catholic school where I had taught science in the late 1960s and early 1970s, the national flag of Uganda, and the flag of the Kingdom of Buganda, flanked the Diocese flag at a school function that I attended. Local, cultural and religious rights and identities were asserted even in the context of a Catholic school fête.[31] Traditional forms and idioms of kiGanda song, dance, speech and ritual in the public performances featured strong HIV and AIDS messages. The parish priest and school pastor spoke forcefully in support of faithfulness in marriage and use of condoms, after asking blessings for both the nation and the Kingdom of Buganda.

Although the majority of Ugandans are closely attached to their land for survival, subsistence, status and prestige, among other reasons, this attachment also means that they do not travel widely. There is a low degree of physical mobility and travel except along trade corridors, and this is relatively highly structured since people travel only in limited and well-defined circuits, especially between urban areas to rural family land-holdings, or for trade along a few major roadways. Paved highways connect the main urban centres, especially in the south, and an arterial route connects the border of Kenya with the northwest border of Tanzania, but it does not extend much beyond this even today. In the northern half, continuing violence and terror raids led by the Lord's Resistance Army drastically inhibit all but essential travel. The relatively high cost of petrol, automobiles and even public transport also militates against large scale mobility. My personal impression, both in the late 1960s and early 70s, when my family lived there, and again in 2003, was that Ugandans in all parts of the country were exceptionally 'house-proud' and dedicated to their homes, gardens and farms. They did not stray far from these without good reason, and never very often. There are small markets within walking distance of everyone, and churches and schools are everywhere. Most people, then, do not travel much further than they can easily walk most of the time.

Most people are strongly associated with some form of freehold tenure land, and residence in rural villages has been stable, probably for centuries.[32] This stability—until it was disrupted during the period of political and social degeneration under Milton Obote and Idi Amin between 1971 and 1986—may have allowed HIV to remain endemic in the population for many years, even generations or centuries, before breaking out of its isolated sexual networks and going global in the late 1970s. It has been suggested that a low-level endemic HIV infection

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of kingship could count on broad popular support, social relations and perception of history in the Ankole region have rather appeared to militate against re-acceptance of monarchical institutions' (Doornbos 2001).

[30] Mukyala-Mukiika 2000: 96; Doornbos 2001.

[31] The Ganda kingdom has been dominated by Protestants since the late nineteenth century when the protestant faction won an internal struggle against the Catholic faction. Thus, the display of a Ganda Kingdom flag at a Catholic school is significant in showing the broad appeal of the Ganda monarchy.

[32] Richards 1966.

may account for the low population densities in Buganda and the southern kingdoms despite their obvious ecological advantages, and may account for the heavy toll taken by otherwise ordinary diseases in Buganda in the late nineteenth century.[33] HIV spread might well have been limited by the residential and social isolation of most Ugandans until very recently. This probably also helps to account for the sudden drop in HIV-prevalence in 1992 and after as social arrangements and routines began to settle down again after the years of disruption. In either case, the residential stability of people in the Ugandan landscape is likely to have created closed clusters of sexually active persons with few links across to other clusters. This is a critical feature of the distinctive configuration of the Ugandan sexual network.

The configuration of social and sexual networks is also affected by the fact that only approximately 15% of Ugandans are urban,[34] compared with 58% of South Africans. The relatively low degree of urbanisation is partly due to some 20 years of conflict and collapsed infra-structure and scarcity of jobs in urban centres, but it was also the case before the period of social collapse. People have never had to move to cities for work or to survive because subsistence agriculture continued to work well and provided sustained livelihoods for all. Even when Ugandans choose to live in an urban area, they try to maintain continuing links to the rural areas and to clans and families that can provide them with farm produce and other amenities.

Other data on sexual and marital patterns lends support to the contention that Uganda's sexual networks differ markedly from those in South Africa. Uganda shows a relatively late age for onset of sexual activity, for instance, compared with a much earlier debut in South Africa. In Uganda, the median age of sexual debut for women increased from 16·5 years in 1989 to 17·3 in 2000/01, and for men from 17·6 in 1995 to 18·3 in 2000–2001.[35] According to Maria Wawer's research in Rakai, however, the median age of first sex in the 40 villages of Rakai where the study was based may have fallen from 17·1 to 16·2 years for men, and for women from 15·9 to 15·5 years.[36] Not all studies support these ranges for age of first sex, however. A study conducted between February and April 2005 in Mayuge District of Eastern Uganda[37] with 197 children aged 8-14 and 100 adult parents/guardians led the investigators to the conclusion that 58% of these children had 'sexual intercourse' at least once (43% of boys and 57% of girls), mostly (70%) with others close in age. But, despite some variation, the age of first sex is apparently very close to the relatively early age of first formal marriages for the majority of the population. The median age at first marriage in Uganda was 17·7 years in 1969.[38] Other data shows that 50% of 15-19 year olds were already married in 1995 according to DHS surveys.[39] Marriage does not necessarily exclude other sexual contact, of course, but it does set up formal means for control of sexual activity. These Uganda marital patterns differ strongly from the extraordinarily late age of marriage in South Africa if South Africans choose to marry at all.

While we do not have details of actual configuration of sexual networks, all of these factors above suggest that sexual networks are normally highly clustered, and often discrete, with few

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[33] Wrigley 1996:238; Reid 2002:36.

[34] Asamoah-Odei, et al. 2004: 36.

[35] Bessinger & Akwara et al. 2002; Udjo, 1998.

[36] Brown 2005.

[37] Lwanga & Othieno 2005.

[38] Udjo, 1998.

[39] Measure DHS 2002; Kirby, 2004.

links between them, and few long distance or randomised links across the population as a whole.

South Africa

By contrast, it appears that South Africa has highly randomised, multiply-interlinked networks in which the majority of sexually active people have sex with at least two others. As in Uganda, there are many reasons for this.

Relative to Uganda and many other African countries, South Africa has a low degree of social differentiation by language, ethnicity, region, or class and status, and these factors have relatively little influence on choice of sexual partners. Virtually all South Africans today live in multi-ethnic, multi-lingual communities, even in rural areas. This is due, partly, to the exceptionally high mobility of people—men, women and children alike. But even high mobility does not fully account for the 'mixed' ethnic identities of South Africans. It appears to be deeply rooted historically. Any social arrangements that existed prior to 1820—the year that Shaka Zulu was murdered by his half-brother, the Zulu kingdom fully established, and the first large group of British settlers established in the eastern Cape—were almost completely swept away across what is today the country of South Africa by warfare, large-scale migrations, shifting allegiances, and changing ethnic, territorial and racial boundaries for the subsequent 90 years or so. In contrast to Uganda whose ethnic and political identities are supported by histories and stable land holdings that are known for half a millennium into the past, there is no contemporary political identity in South Africa that is more than two centuries old, and most are younger than that. (The Bushmen/San and Khoekhoe, South Africa's first people, no longer exist as distinct ethnic groups and are now classified as 'Coloured' in South Africa's racial vocabulary.) Moreover, identities are only weakly associated with territory or land. There have been too many political and territorial re-draftings of the landscape to permit such stable identities. The last wholesale redrawing of the South African map was as recent as 1996, when the four former provinces that had existed since the middle of the nineteenth century (Cape, Natal, Transvaal and Free State) were divided into nine new ones. Change has been so pervasive and well accepted that the old territorial identities evoke little nostalgia and are almost entirely absent from conversation, even from memory. At this level, territorial identity seems to have been flexible. The traumatic history of Apartheid, most recently, but also of the Anglo-Boer War and other violent conflicts has perhaps contributed to South Africans willingness to forget their differences, or perhaps made it even more amazing that they should forget. Communication is rarely difficult as everyone learns at least two national languages in school, and most speak more in their daily lives. But, in any case, it is remarkable that few differences of languages, ethnicity, class or status make much impact on everyday social relations, including sexual relations, today.

This is likely to seem incredible to many who know South Africa as the land of Apartheid, but the political system that remained in place for most of the second half of the twentieth century had a paradoxical effect. While it was built on the premise of ethnic and racial differences, and sought to strengthen these wherever possible, it evidently failed in this mission. Ideologies that developed during the struggle against Apartheid included rejection of differences of all kinds, and political movements were inclusive of all ethnic, racial and regional groups. In fact, in contrast to the Ugandan 'premise of inequality', South African political culture is premised on a deep commitment to equality, or even 'equivalence'[40] within certain limits. This is especially true for young black males, who assert their personal autonomy wherever possible, and expect

[40] Thornton 2005.

others to do the same. Hierarchy is weakly developed in Black South African traditional cultures because of this principle. This was strongly reinforced during the long struggle against Apartheid in which the political principle of equality was the ideological foundation, but was probably an important cultural principle from at least the nineteenth century. In stark contrast to Uganda, where 'every social relationship has … [an] "unequal" aspect',[41] in South Africa persons are held to be fundamentally equal in contrast to Uganda's 'premise of inequality'. This principle has tended to permit large scale migration, especially of males (but also of women) because each head of a household is believed to be effectively autonomous. This autonomy is both a goal for young men who seek to leave their parental homes, but also a condition that has permitted large numbers of people to seek their own fortune regardless of domestic arrangements or other social commitments. The result has been a highly mobile population that is constrained by few social barriers in the formation of social, economic, political—and sexual— networks of relationships.

The principle of equality or equivalence may also help to account for the distinctive marital patterns in South Africa. There is an extremely low prevalence of marriage (monogamous or polygamous). In 1995, for instance, 58% of women aged 15-49 reported that they 'never married', while in 1999 this percentage had climbed to 60%.[42] A series of surveys of villages under the authority of a chief or 'traditional authority' that I conducted in 2000 with my students Joseph Nkuna, and Kereng Kgotleng supported these statistics. For instance, in Emjindini, a predominately Swazi-speaking 'tribal trust' area with collective land tenure under Chief Kenneth Dlamini, 60% of all household heads that were interviewed (N = 335) were not married.[43] Similarly, in Mafefe, a SePedi speaking village in Limpopo Province, 53% of household heads were not married, although the median number of children per household was 3, and the absolute number of children ranged from 0 to 17. In Mafikeng, a predominately SeTswana speaking town in Northwest Province, 61% of all household heads interviewed were not married. The median number of children was 3.0 per household (range: 0-11, N = 306) in the Mafikeng sample. In Dan village, a predominately XiTsonga-speaking community near Tzaneen, Northern Province, 51% were not married, with a similar number of children per household as in the other samples (median = 3, range 0-12, N= 345). In short, the majority of child-bearing couples, in these areas at least, are not married. Consequently, the number of sexual contacts outside of marriage is high, partly because of the low prevalence of marriage, and partly due to the long 'window' between age of sexual debut and age of marriage. This does not in itself lead to promiscuity, but it does largely eliminate the institution of marriage as a means of control. In fact, marriage is effectively de-linked from child-bearing. While South Africa has the lowest fertility rate in Africa, births to adolescent unmarried women is high, though still lower than sub-Saharan Africa as a whole. More than 30 percent of 19-year-old girls are reported to have given birth at least once.[44] There is typically a long gap between the first child, borne in adolescence, however, and other children that may be borne after marriage. Thus, marriage and child-birth are effectively independent of each other. When so few are married, the exhortation to 'be faithful' (to a marital partner) makes as practical little sense to most South Africans as the idea of abstinence until marriage.

The low prevalence of marriage is itself probably a consequence of the fact that larger kinship units such as clan or kin-based organisations are virtually absent, and, where they exist, are

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[41] Beattie 1971: 7.

[42] Budlender, Chobokoane & Simelane 2004.

[43] Thornton 2001.

[44] Kaufman, De Wet & Stadler 2001.

small in size and exercise little control over the behaviour (sexual or otherwise) of their members. In any case, there are no property-holding lineages, clans, and even larger family business units are rare, especially among black South Africans. On the other hand, the low rate of formal marriage, and the late age at which those who do marry decide to marry, also means that larger clan or kin-based organisations rarely form. It is probably not possible to say which is the cause and which is the effect, but the result is that most people are born and grow up in households that contain an eclectic mix of close and distant kin, or non-kin (girl/boy-friends, parents of girl/boy-friends, etc.) who cooperate in domestic arrangements, but who do not constitute formal or genetic families. Occasionally, larger kin units are present, but they are relatively rare, and do not form corporate or property-holding groupings in any way. Inheritance of property, then, is also rare. Larger 'clans' or kin organisations, where they exist, are generally informal, and exist only for those who are more wealthy, or who are linked to royal or elite lines of descent. For the vast majority, however, there are no super-ordinate groupings of kin, and no hierarchies of senior kin that might work to control sexual access or behaviour. This pattern is pervasive in South Africa, but probably mostly limited to it. Patterns in Botswana, Lesotho and Swaziland are different, although citizens of these countries travel frequently to or reside within South Africa for varying lengths of time.

Again, South Africa shows marked differences from Uganda with respect to systems of traditional authority. While Ugandans, especially in the areas of the old kingdoms—Nyoro, Toro, Ankole and Buganda—generally have affection for kingship and traditional authority, and believe it exerts a positive moral influence, South Africans are widely ambivalent about their heritage of traditional authority. While the existence of chiefs and kings is guaranteed by the South African 1994 constitution, and their 'cultural rights' entrenched, traditional authorities have no political power. In South Africa, the majority of chiefs and kings were aligned with the Apartheid government—often more by default than by choice—and were targets of resistance before 1992. This radically decreased their moral authority. In Uganda, since these institutions were abolished in 1967 and only re-established after 1994, they were not contaminated by the period of state violence, corruption and misrule during that period. They have consequently retained moral authority in the eyes of many Ugandans.[45] There has been in the last decade a resurgence of support for chiefship and kingship in South Africa, but the system of traditional authority is still weak and virtually impotent in the face of state authority. It exercises little control over behaviour of any of its members/clients.[46]

South Africa has a high degree of physical mobility among men, women and children. Most people travel at least some of the time to large parts of the rest of the country for work, ritual events such as funerals, church celebrations and pilgrimages, and for other reasons. Labour migration from rural areas—so-called 'labour reserves'—to urban areas and mining compounds used to drive much of this migration, especially in the first three-quarters of the twentieth century, but mine employment has dropped dramatically since then, and most of the internal travel is now for other reasons. The overall extent of internal travel is difficult to measure since transportation is not regulated and statistics on internal travel are not kept. There are some useful indicators, however. First, many people have automobiles or access to them. There are in total approximately 11 people per automobile in South Africa, and around 6.4 persons per 'working vehicle' of all kinds,[47] and 4.6 million adult South Africans (16.1%)

[45] Karlstrom 2004.

[46] Thornton 2002.

[47] South African Institute of Race Relations 2005:375. 'Working vehicle is defined in the statistics as a road-worthy, licensed vehicle with four or more wheels. There are in fact many more that are not road-worthy or that are unlicensed in the rural areas especially, and this does not include motorbikes/motorcycles.

own or use a car.[48] By contrast, there are over 500 persons per passenger car in Uganda.[49] Road infrastructure in South Africa is also excellent. 20.3% of all roads in South Africa were paved, compared with 6.7% in Uganda. More importantly, South Africa has a finely reticulated road network that covers the entire country of 1.2 million hectares.[50] This is not true of Uganda. Telecommunication coverage can also indicate the degree of communication in a country, and could also be a proxy measure of physical mobility. Accordingly, there are 114 telephone land lines per 1000 people in South Africans compared with only 3 in Uganda, and 190 mobile phones per 1000 people compared with 8 in Uganda.[51] The high levels of mobile phone use appears to be a regional phenomenon since all of the southern Africa countries rank in the top 10 of 50 continental African countries with respect to mobile phone use. After South Africa, Botswana ranks second (123 per 1000 persons), Namibia is third, Swaziland is fourth, while Zimbabwe and Lesotho are seventh and tenth respectively. In sum, then, South Africa and southern Africa as a region has a dense communication and transport network.

As we have seen, for the majority of the population in South Africa, free-hold tenure land is exceptionally scarce, and land ownership is rare. This leads to the instability of residential groups in rural villages, as well as townships, cities, and other residential areas, and the instability of household constitution. Probably millions of people (the number is not known) have access to land in communal areas, but they do not *own* the land except as members of communities that hold the land communally. They do not possess title deeds, and in most cases cannot because the land is not surveyed. Land in these areas is usually allocated by the chief or the headman, the traditional authorities in these areas. Although legislation has recently been introduced to make secure tenure possible in these areas, as of 2006 nothing had changed. Until the end of Apartheid in 1992, black people in urban areas have had to rent accommodation, and rentals rarely included land. While there was some free-hold tenure land in urban areas by the middle of the last century, this was progressively decreased by Apartheid legislation. Since 1994, this issue has been redressed. In the last decade, the government has provided 1.7 million housing units for low income persons, and has secured free-hold tenure for 400,000 houses in urban areas. The majority of urban residents, however, do not have secure tenure on their housing, or they rent from others. Other rural people are resident on farms owned by the few large land owners, and thus do not have ownership rights to their property.

Relative to much of the rest of Africa, there is a high degree of urbanisation. The majority of the South African population lives in large urban centres—55-58% overall, with 92% of the White population, 98% of the Indian and 84% of the Coloured populations living in urban areas. Approximately 45% of black Africans live in urban areas.[52] Because of the high levels of mobility, those that do not live in urban areas (especially black people) have relatively frequent contact with urban centres and with other close associates, kin and sexual partners that do. Although most people classified 'White', 'Coloured' or 'Indian' (these categories are self selected in the census and other statistical surveys) are urban, many do travel to rural areas, or, especially, between urban areas.

South Africa shows an early initiation of sexual activity and late marriage. The 1998 DHS survey reported a median age of first sex as 17·8, but also reported that 37% were having sex

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[48] South African Institute of Race Relations 2005:385.

[49] South African Institute of Race Relations 2005:377.

[50] South African Institute of Race Relations 2005:519.

[51] South African Institute of Race Relations 2005: 518.

[52] South African Institute of Race Relations 2003: 10; South African Institute of Race Relations 2004:12-13.

by age 19, and 75% by age 24.[53] The median age at first marriage for African ('black') males is 28·4 to 31·9 depending on how this is calculated (raw rates or 'singulate mean age at marriage', SMAM). African females' median age of first marriage is 24 to 29·6 years of age, while the mean for South Africa as a whole lies between 25 and 30·8 years.[54] There is also a high prevalence of 'transactional sex' and/or 'prostitution' (exchanging sex for goods or money).

All of these factors tend to contribute to the formation of densely interconnected sexual networks, in which the majority of the sexually active population is multiply linked to all parts of the network, both near and far, and across most social categories. Race continues to divide the country's peoples and thus differentiates sexual networks into several different networks based on racial group but there is little evidence to suggest that the shape of sexual networks is significantly different in any of them. There are considerable—but so far unmeasured and possibly un-measurable—sexual links across all 'racial' sub-populations. Differences that do exist are probably due to the differing density of contacts and their timing rather than to strong social differentials within each racial group. In other words, it appears that in South Africa there are strong cultural similarities with respect to sexual networking both across 'racial' sub-groups and within them.

In Uganda, it is likely that the relatively rapid rise in HIV prevalence in the late 1980s and early 1990s was related primarily to the cross-linkage between otherwise isolated, clustered or 'fractal' networks. Perhaps, this was due to the fourteen years of warfare and chaos that gripped the country from the coup d'état by Idi Amin in January, 1971, and under his successors, Milton Obote and Tito Okello, until the current president, Yoweri Museveni, re-established orderly rule in January 1986. Ugandans see this period as a period of moral collapse, not just one of economic and political chaos.[55] According to this model, the increase in HIV was the result of social disorganisation that linked previously separate communities (and sexual networks) to each other, while the sudden decline in HIV prevalence is due to the severance of links between these separate densely-clustered networks. The rapid decline in prevalence was caused by changes in all of the A, B, C factors—increasing abstinence, being faithful to one partner and reduction in number of concurrent partners, and condoms—and to the 'D' (death) factor, especially the death of persons that connected these networks, especially soldiers, truck-drivers, 'sugar daddies' (and 'sugar mamas'), prostitutes, and travelling 'businessmen' who ran smuggling and contraband operations during the period of instability and warfare.[56] While this resulted in a rapid decline in prevalence overall, it maintained isolated pools of infection that did not cross-link to each other. For instance, among fishermen on Lake Kasenyi who had access to Voluntary Counselling and Testing clinics, prevalence was 81%. Lakeshore villages on Lake Albert showed a 24% prevalence, compared with only 4% for neighbouring inland villages.[57] Most fishing villages in Uganda are exceptionally isolated enjoying access only by boat and by footpath or track in dry weather. Large local differences such as these can only be caused by limited linkages between these clusters or communities. These residual, local 'pockets' account for the fact that declining prevalence does not tend towards zero, as the power law model shows.

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[53] Measure DHS 1998 (South Africa).

[54] Budlender, Chobokoane & Simelane 2004; Statistics South Africa 1998.

[55] Karlström 2004: 598.

[56] Karlström 2004: 598.

[57] Wasswa 2005; United Nations Uganda 2005.

In a network of this configuration, so long as some (relatively few) people who provide significant linkages across densely *intra*linked clustered sub-networks no longer serve as transmission links (because they die, start using condoms, stick to one or no partner, or restrict their sexual activity to their own network), overall prevalence is likely to decline rapidly. This would explain both the rapid rise to a 'cusp' in 1992, and the rapid decline afterwards which appears to reflect a sudden change of state in the social 'mass'. It also helps to explain why HIV prevalence has decreased without significant declines in birth rates or overall declines in sexual activity, and why trends follow power laws rather than exponential growth curves more typical of ordinary demographic and epidemiological process.

In South Africa, it is likely that the more typical 'growth-curve', or exponential, rise in the HIV prevalence, and the very high levels of HIV that are reached —up to 38·6% [95% CI range= 30·0%-48·1%] among black African women aged 25-29 is caused by the existence of a large and pervasive 'small-world' network of sexual contact with relatively little segregation into clusters of sub-networks.[58] A network configured in this way presents little in the way of structural barriers to HIV transmission, and thus HIV infection is able to propagate freely, at first approximating an exponential model of free growth, then evolving to a linear trend suggestive of free diffusion of the virus. The spirit of 'freedom', including sexual freedom, and the new freedom of movement that accompanied the end of Apartheid—signalled by the release of Nelson Mandela in 1992, and the installation of a new democratic government in 1994—may have contributed to this. Long-term and enduring structures of kinship, domestic power relations and property regimes are probably more significant causal factors, however.

CHANGING PREVALENCE: A PROPERTY OF THE SOCIAL WHOLE

Since we lack specific empirical knowledge of these networks, it appears that we can derive knowledge about them from different 'signatures' that show up in prevalence trends over time. This approach also suggests that the much-discussed link between poverty and AIDS may in fact be more closely related to—and complicated by—regimes and networks of property ownership, kinship and domestic power, rather than to absolute levels of economic prosperity alone. Indeed, there is no obvious relationship between HIV prevalence and wealth. Uganda with its much lower HIV prevalence rate is much poorer than South Africa. In South Africa, the AIDS deaths that have been most visible have been among the wealthy elites, even though the bulk of deaths have been among South Africa's far more numerous poor. Three of the poorest of nine provinces—Limpopo, Northern Cape, and Eastern Cape—also have the lowest rates of HIV infection, and the wealthiest provinces—Gauteng and Western Cape—lie at opposite ends of the HIV-prevalence spectrum. In other words, levels of wealth and poverty may be relevant to understanding the progress of the epidemic, but only insofar as specific forms of wealth—land, currency, property—and the ways in which they are transferred, inherited, or transacted determine the configuration of sexual networks.

We have shown that the configuration of these networks is determined by a complex set of *social* factors in addition to the individual *behavioural* factors. This suggests that intervention will be much more effective in situations where relatively isolated but still dense, nucleated or highly clustered networks exist, such as in Uganda, since prevalence can be changed through the change in sexual behaviour of relatively few people. It also suggests that population-wide interventions will be less effective than specifically targeted interventions that aim to disrupt linkages between dense but relatively self-contained smaller networks. On the other hand, it

[58] Human Sciences Research Council 2002.

also suggests that ALL interventions will be relatively less effective in multiply-connected 'small world' networks such as we find in South Africa since elimination of even the majority of nodes will NOT affect the efficiency of HIV transmission in the overall network. Prevalence will probably continue to rise or remain relatively stable at high levels *despite* changes in sexual behaviour of significant numbers of people. These networks function in many ways like the Internet which was designed specifically to remain an active and efficient transmitter of information despite the elimination of some arbitrary number of specific nodes/links.

This may explain the apparent resistance of HIV prevalence to large scale and costly interventions of all kinds in southern Africa. Thus, while small changes in sexual behaviour can radically and rapidly reduce HIV transmission in minimally cross-linked clustered networks—such as Uganda—much greater, population-wide behaviour change is necessary in the homogenously interlinked networks such as those that seem to exist in South Africa.

In view of these differences, Low-Beer and Stoneburner asked in 2003, 'Is Uganda unique?' in its apparent success in bringing down HIV prevalence,[59] but warned in 2004 that 'the Uganda evidence is still viewed with caution and confusion'.[60] Is the pattern that we have seen in HIV trends in Uganda simply the consequence of unique historical processes that will never happen again in precisely this way? If not, can some factor or factors be isolated and exported to other countries, such as South Africa, where there is desperate need to find some intervention that works?

While these questions are reasonable, they lead in the wrong direction. Changing HIV prevalence, as Caldwell and his colleagues suggested a decade after HIV was firmly identified, is strongly determined by the cultural and social roots of sexual networks.[61] The specific configuration of these networks determines what kinds and what quantity of behaviour change (or death of HIV-infected persons) will have noticeable impacts on HIV prevalence over the population of sexually active people.

The search for one (or several) discrete and identifiable factors—such as abstinence or condom use—is therefore misdirected if the changing pattern of HIV prevalence is a property of the overall sexual network, a complex system whose properties are systemic and global rather than individual and local. Although people's motives, their assessment of 'risk', their 'behaviours', or even their deaths help to determine the configuration of sexual networks, according to this systemic perspective it does not matter how links (sexual contacts) are broken or formed; what is important is their density and timing. Changes in any or all of the A, B, C or D (death) factors may lead to change, but the *magnitude* of their effect will depend on the configuration of the social structures that underpin the sexual network and determine its characteristics.

Regardless of why or how links form or break, if the network configuration is still highly efficient at transmitting HIV, HIV will continue to increase despite relatively large changes in any or all of the prevention factors. If the network is configured so that relatively smaller changes result in a re-organisation of the overall network in a way that makes it more resistant to HIV transmission, then HIV prevalence will fall in a non-linear way, probably according to a power law with an exponent approximating –0·5.

Historical factors are therefore relevant insofar as they can be related to the configuration of the sexual network. In Uganda, it is clear that a vast mobilisation of all aspects of Ugandan civil

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[59] Low-Beer & Stoneburner 2003.

[60] Stoneburner and Low-Beer 2004:714.

[61] Caldwell, Caldwell & Orubuloye 1992.

society and government were involved in communicating the AIDS message, and in helping to restructure Ugandan society. Clusters of high density sexual links that existed around practices such as wife sharing, widow cleansing, widow inheritance, sexual license associated with funerals, nightclubs, circumcision and other rituals and festivals, was effectively stopped. Schools, churches, the army, all aspects of government at all levels, business and labour, traditional healers, chiefs and kings, as well as NGOs and external donors all worked together to bring about large-scale change at the national level. Changes in sexual behaviour *and* mortality worked to restructure the sexual network. But without the high levels of social integration seen in the overall integrated response, it seems unlikely that changes in HIV mortality or behaviour change would have had the effect that they did. While Uganda 'found its own response' through communication, education and community mobilisation programmes,[62] the effect of this response was a fragmentation of a sexual network that was relative easy to fragment. Unfortunately, it is probable that a similar level of integrated response in South Africa would have less effect because of the different configuration of the network.

These findings may also reflect differences between eastern African and southern African regions overall. In eastern Africa as a whole, median prevalence decreased from 12·9% in 1997/98 to 8·5% in 2002 in a way similar to what happened in Uganda. In the southern African region as a whole it increased from 21·3% in 1997/98 to 23·8% in 2002.[63] It has long been assumed that the large regional differences between eastern, central, southern, and western Africa would eventually even out and diminish over time.[64] In fact, these marked differences have stabilised. In an article that surveys much of the evidence for these sub-regional differences in sub-Saharan Africa, Assamoah-Odei, Calleja and Boerma call for greater attention 'to the heterogeneity of the HIV/AIDS epidemic in subregions [eastern, western, central and southern] and countries.'[65]

Such regional differences suggest that the extent of sexual networks may indeed be regional. There are generally larger flows of population within these regions than between regions. There are widespread, though often subtle, cultural and social-structural similarities within regions. In southern Africa, the borders between South Africa, Lesotho, Swaziland and Botswana are completely porous in all respects. This is increasingly the case, too, for southern Mozambique, Zimbabwe and South Africa. Although the population flow is largely towards South Africa, cultural flows go both ways. There is probably less regional population flow in eastern Africa, partly because people are simply less mobile, but there are widespread linguistic, cultural, political and social similarities and links there, too. If trends in HIV prevalence can be related to the efficiency with which sexual networks transmit the virus, then this approach helps us to understand the heterogeneity of the epidemic at the national or even the regional level.

The focus on large-scale systemic processes of the sexual networks, contextualised in terms of the family social structures, domestic property regimes and political systems, permits a move away from the current focus on individual behaviour, risk assessment and (supposed) rational action. This suggests, finally, that preventive interventions will have to pay more attention to the integration of all strategies at the national or even regional level to be effective. More than

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[62] Low-Beer & Stoneburner 2003.

[63] Assamoa-Odei, et al. 2004: 35.

[64] Assamoah-Odei, et al. 2004.

[65] Assamoah-Odei, et al. 2004: 35.

A, B, C or even D, what marks the Uganda experience, and differentiates it from South Africa is the degree of integration of prevention measures across all levels and divisions of society.