

PERSPECTIVE

THE AFRICAN AIDS EPIDEMIC: REFLECTIONS ON A RESEARCH PROGRAM

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Sub-Saharan Africa has suffered the major impact of the AIDS epidemic, with almost 70 per cent of the world's HIV-infected persons and almost 80 per cent of AIDS deaths. The primary source of infection has been heterosexual transmission. In the absence of a vaccine, the only protection has been behavioural change. A collaborative program between research teams of the Australian National University and three African universities spent 12 years investigating the social and behavioural context of the African epidemic with the aim of providing an understanding of the social dimension of the epidemic so that behavioural change might be accelerated. This paper provides a history of the project's activities and summarizes its findings.

This article is partly about the sub-Saharan African AIDS epidemic, and partly about how and why an ANU collaborative research project helped to throw light on it. AIDS was first identified in the United States in 1981, but, within a year, cases were located elsewhere in the world including sub-Saharan Africa which was destined to suffer the greatest impact of the epidemic (Grmek 1990; Mann, Tarantola and Netter 1992). By the end of the 1990s 50 million people throughout the world had either died of the disease or were HIV-positive and likely to die from it (UNAIDS/WHO 1999). Two-thirds of seropositive persons were to be found in sub-Saharan Africa, and over 80 per cent of the deaths had occurred there. There was a string of countries in East and Southern Africa with four per cent of the world's population and 50 per cent of its AIDS, and here the situation was comparable with the historical experience of the great epidemics, the Black Death, the Plague and Spanish 'flu. Uganda's proportional loss of population was already threatening to be comparable with that of the Soviet Union in World War II: AIDS deaths and HIV-positive persons by 1999 amounted to 13 per cent of Uganda's population when the epidemic began. As Table 1 shows, the highest prevalence levels are now in Southern Africa, with most countries experiencing adult HIV prevalence levels in the range 20–36 per cent, which means a lifetime probability of dying from the disease of 65 per cent or higher (Blacker and Zaba 1997). Some districts in KwaZulu Natal have surpassed 50 per cent adult prevalence levels. In Botswana, where life

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Table 1 Adult (15–49 years) HIV prevalence and AIDS mortality, 1999

Group/ Country	Adult HIV prevalence (%) ^a	Lifetime risk of AIDS death (%) ^b	Reduction due to AIDS in 2000–05 life expectancy (years) ^a	
Highest African HIV levels	Botswana	36	75	34
	Zimbabwe	25	70	26
	Swaziland	25	70	25
	Lesotho	24	68	24
	South Africa	20	65	19
	Namibia	20	65	20
	Zambia	20	65	18
	Malawi	16	58	14
	Kenya	14	55	17
	Mozambique	13	50	11
	Djibouti	12	46	11
	Burundi	11	42	11
	Rwanda	11	42	10
	Ethiopia	11	42	10
	Ivory Coast	11	42	11
	Uganda	8	36	8
	Tanzania	8	36	8
Cameroon	8	36	9	
Togo	6	32	7	
Nigeria	5	22	6	
Selected African countries with low HIV levels	Benin	2.5		
	Gambia	2.0		
	Mali	2.0		
	Senegal	1.8		
	Guinea	1.5		
	Algeria	0.1		
Highest HIV levels outside Africa	Egypt	<0.1		
	Haiti	5		
	Bahamas	4		
Other countries of interest	Cambodia	4		
	Thailand	2.2		
	India	0.7		
	USA	0.6		
	Brazil	0.6		
	Russia	0.2		
	Australia	0.2		
	Britain	0.1		
	China	0.1		
Indonesia	0.1			

Sources: a United Nations 2001. b Blacker and Zaba 1997.

expectancy had reached 60 years in 1980 and was forecast to be 70 years in 2000–2005, it is now only 36 years (United Nations 2001: 13).

Demographers have been prominent in the study of AIDS, a disease which covers their full range of expertise, and in recent years the International Union for the Scientific Study of Population has had a Scientific Committee on AIDS. The greatest challenge for statistical demographers and statisticians is to produce a satisfactory model of the rise and decline of the disease showing that it has the characteristics of epidemics and a predictable path similar to those diseases with a much shorter time between infection and symptoms (days instead of almost a decade). The United Nations (2001: 12–16) now takes into account in its projections the impact of AIDS on mortality, population growth and age structure. The impact of HIV infection on fecundity has been shown to exist (Gregson *et al.* 1997; Carpenter *et al.* 1997) but its overall magnitude is still being debated and it has not yet been incorporated into projections. It is claimed that in Uganda it has probably raised the age of female marriage, but nuptiality figures are unreliable and age at marriage is subject to change from other forces. HIV infection is spread by migration, especially from urban to rural areas, and those with symptomatic AIDS often return from where they were infected to their places of origin (Herdt 1997). Social demographers have been better placed than most, partly because of their experience within the fertility area with surveys and anthropological approaches, to investigate the cultural, social and behavioural aspects of infection and its sequelae.

The advent of AIDS is so recent that research on the topic has only a short history and is still evolving. AIDS was first discovered in 1981 and named in 1982. Its causative agent, the retrovirus HIV, was identified in 1983, and regular reporting of its prevalence and AIDS deaths to WHO began in 1986. By 1985 adequate testing kits for HIV had been devised and in the same year USAID and British foreign aid began paying for the first anonymous testing of blood from women attending antenatal clinics in some African urban areas. In 1987 the US Bureau of the Census set up its international AIDS data bank. In 1987–88, the Uganda Ministry of Health, with support from the Rockefeller Foundation, conducted the first – indeed the only – national household sample survey for HIV / AIDS, taking blood tests and collecting socio-economic data. The results have never been officially released but many of the findings are known. They confirmed that in sub-Saharan Africa as many women as men, or perhaps even more women than men, were infected. This was a very different situation from that found in the West where far more males than females were infected: in Australia more than ten times as many. The conclusion seemed to be that HIV transmission in Africa was largely heterosexual and that homosexual and intravenous-drug-injecting transmission was relatively unimportant. This was an astonishing situation in the light of the belief at the time that in a single sexual act between a man and a woman, both healthy except for the fact that one is HIV-positive, the chance of an HIV-positive man infecting a woman is around 300 to one, and of an HIV-positive woman infecting a man 1,000 to one (Johnson and Laga 1988).

These transmission rates seem extremely low if they are to sustain an epidemic unless there is a high level of high-risk sexual relations or there are cofactors present, mostly in the form of ulcerating STDs (sexually transmitted diseases such as chancroid, syphilis or genital herpes), or both. Multipartner sexual relations tend to be dangerous because of the sexual networks of infection that they create. Relations

with commercial sex workers are especially dangerous in sub-Saharan Africa because of these women's level of unprotected sex with a large number of different partners. In Africa they are three or four times as likely to be infected as other women (Health Studies Branch 2001). Three other points should be noted. First, gender equality in HIV levels in Africa is explained by men's riskier sex lives being counterbalanced by women's greater infectivity. Second, HIV levels are higher in urban than rural areas (WHO used a ratio of ten to one in their 1980s models and the median level is now about threefold; see Health Studies Branch 2001), so that many rural epidemics would not be sustainable but for continued reinfection by people returning from the towns. Third, most of our knowledge of African HIV levels and trends still comes from testing pregnant women at antenatal clinics, an unsatisfactory situation in that it now appears that seropositive women are less likely to conceive than seronegative women. By 1992 there was sufficient information on the global AIDS situation for Mann, Tarantola and Netter to publish the encyclopaedic *AIDS in the World*.

Australian National University involvement

The ANU Department of Demography (now the Demography and Sociology Program) in the Research School of Social Sciences has had, as befits a national university, a long history of global and development interests. The African interest, in terms of both staff and students, began over 40 years ago when Pat Caldwell and I went to research and teach in West Africa. The early research focused on fertility and its control. From 1972 the Department of Demography was funded by the Population Council to undertake the Changing African Family Study in 13 of the continent's countries (see Okediji *et al.* 1976), and from 1979 we began to include an interest in the identification of populations suffering pathological sterility and the role in this of sexually transmitted disease, especially in Middle Africa (see Caldwell and Caldwell 1983). From 1974 we had begun to work on the role of parental education in determining the survival of children, both with and without access to modern medicine, and this developed into a global interest in the social and behavioural determinants of health.

Most of this research had a common pattern. It started with seed money from the ANU but, after the first published results, was funded by others, usually American foundations. The work usually involved other members of the Department as well, always involved research students and later postdoctoral fellows, and was always collaborative with African institutions and researchers, many of whom spent time at the ANU. Increasingly, the collaboration was with our ex-students. Researchers were supported wholly or partly by the funders for long periods. The work on AIDS was made possible by two grants, each of which was offered to us after the granting institutions had conducted a search for the program undertaking the most promising work in their area of specific interest. The first was a 1988 grant from the Rockefeller Foundation to the ANU to establish a Health Transition Centre and an international journal, *Health Transition Review*, associated first with the University's Department of Demography and then with its National Centre for Epidemiology and Population Health. There was an understanding that the focus would be on regions with the highest levels of mortality, especially sub-Saharan Africa. The second was a 1992 grant from the Swedish Agency for Research Coop-

eration, SAREC, to study the social and behavioural context of the African AIDS epidemic.

We began AIDS work in 1988, at first with colleagues in Nigeria, but soon expanding to other West African countries¹ and later to East Africa. An initial task was to persuade university officials that sexual activity was a respectable area of research to be associated with their universities and their best young social scientists. For this purpose we coined the term 'sexual networking', thus blurring the more exact meaning that term should have. Vice chancellors now regard it as a very respectable and well funded field of research. With SAREC funding we recruited colleagues and their research teams from three countries, Uganda with a fully developed epidemic, Ghana where a major epidemic seemed to be developing, and Nigeria in which one might develop later.

Looking back, it is difficult to appreciate how little we knew about the sub-Saharan African epidemic fourteen years ago. There was doubt as to whether the region had recently been attacked by the epidemic or whether AIDS had always been there and was now being exported to the rest of the world. However, it became clear that the competent heads of hospitals in southwest Uganda were reporting in 1982 a wave of new sick patients on a scale and with a range of symptoms not seen before. They sent such reports to the Ministry of Health in Kampala before identifying their new problem as being an AIDS epidemic. It is probable that stored tissue from patients in sub-Saharan African hospitals before the 1970s has yielded evidence of HIV (Hunter 1993: 64) although the point is disputed. Mirko Grmek (1990), in his history of the pandemic, has argued that the disease was probably originally localized and less virulent somewhere in tropical Africa but became more virulent somewhere outside the region, possibly in California. What is clear is that sub-Saharan Africa was attacked by AIDS in epidemic form at the same time as the rest of the world but proved more susceptible than anywhere else. The level of infection in Southern Africa is now several hundred times that of North Africa and over one hundred times that of Australia.

In the late 1980s there was what we might call secondary HIV infection: by blood transfusion, mostly among the urban middle class, and by vertical transmission from mother to child. However, the main task was to establish (or disprove) that AIDS was a disease primarily transmitted heterosexually in the region, and then to show why transmission levels were so high. We built on our own earlier work and that of others to conclude that, south of the savannah fringe lands of the Sahara and excluding parts of the East Coast, there was only a very low level of anal sexual intercourse. There might be the same inherent level of homosexual preferences as elsewhere but the identification of anal relations with witchcraft kept down its practice. Later, we were able to show an appreciable level of anal intercourse in Nigerian gaols, practised by men who reverted to heterosexual activity when released. Similar work, plus a great deal of consultation with doctors and hospitals, confirmed that there was not a significant level of intravenous drug injecting. Part of the explanation for this was the plentiful availability of alcohol, marijuana and kola nuts, but mostly it was that the world's poorest populations could not afford the price of hard drugs, expensive because of the distance from the major supply areas. That position is apparently slowly changing among the children of the urban middle classes.

It was becoming clearer that there were cofactors for HIV infection. It had been

shown that in the Nairobi slums where most commercial sex workers were HIV-positive, the chance of being infected, for an uncircumcised man with active chancroid (the sexually transmitted disease characterized by the largest ulcers), was not one in a *thousand*, but one in *two* (Cameron *et al.* 1989). This merely increased the need to investigate heterosexual relationships. Not all STDs were important cofactors. We had been involved in earlier work on the low-fertility belt of Middle Africa, where the world's highest levels of primary sterility were a product of the world's highest levels of sterilizing disease (Caldwell and Caldwell 1983). But the culprits appeared to be gonorrhoea and chlamydia, non-ulcerating diseases, and not dangerous for HIV infection in the way that chancroid, syphilis and herpes are, although there is currently some debate about the exact role of these cofactors. To the surprise of many, the low-fertility belt turned out to have low levels of HIV and to be resistant to infection from nearby Rwanda, Burundi and Uganda where the epidemic was raging.² The practice of vaginal drying with abrasive or corrosive materials was strongly suspected to be a cofactor but comparisons of infection rates among dryers and non-dryers has failed to show different rates of infection (Orubuloye, Caldwell and Caldwell 1995; Sandala *et al.* 1995).

This left heterosexual activities and networking as our priority research area. This is not an easy research area and is beset by cultural sensitivities and a great deal of denial by public and religious leaders. There is also a strong mythology, only partly correct, of the contrast between claimed contemporary decay of sexual morality driven by Western influences, and historic near-Puritan practices and attitudes. We tended to regard this as somewhat ironic, believing that a relatively relaxed attitude towards female sexual transgressions had historically been beneficial in providing the region's women with much greater freedom than women in much of Asia and the Mediterranean, and giving their daughters equal survival chances (at ages 1–4 years) to their sons. We started by trawling the anthropological literature and seeking a theoretical paradigm.

Most of the literature was found either in Canberra or in the great Herskovits Africana Library at Northwestern University, Evanston, Illinois. That library also has the most accessible of the three collections made by George Murdock (1967a, b) when compiling the *Ethnographic Atlas* (now the Yale Human Area files).³ These sources confirmed our own findings of sexually fairly relaxed societies. Yet when we published our first overview in 1989 it led to a protest meeting by African students and British anthropologists at University College, London. Most of those students now cite that paper favourably when reporting their own research, and explain their earlier reaction by saying that the paper was not wrong but premature. It is now widely held that Africa's best hope for containing the AIDS epidemic is behavioural change, and, for that to be induced, there must be an understanding of behaviour.

A theoretical framework which we could expand for our own use had been provided by a series of papers that the Cambridge anthropologist, Jack Goody, had written and drawn together in his 1976 book, *Production and Reproduction*. There he argued that the early development of *de facto* freehold land tenure in the ancient Middle East, South Asia and the Mediterranean (an area that he called Eurasia) had led to unequal holdings, the class system and a concern with inheritance and preserving property and social status by the marriage of daughters to men of no lower social class than themselves. This meant the need to keep at bay the adventurer

who, by impregnating the daughter, could claim the right to marry her, and would be the father of inheriting descendants, the grandchildren. The answer was pre-marital virginity ensured by surveillance, force, law and ultimately by placing its need at the heart of the world's religions so that the words 'immorality' or 'sin' were usually identified with illicit female sexual activity. So began millennia of female subjugation. Sub-Saharan Africa was protected from this situation by communal land, bridewealth instead of dowry, strictly male inheritance, and little in the way of a class system. Traditional society regarded female immorality as being constituted by sterility, not promiscuity (Caldwell and Caldwell 1987).

There were reasons to expect multiple sexual partners. Sub-Saharan Africa is characterized by the highest levels of polygyny in the world. Where we worked in Nigeria almost half of all wives were in polygynous marriages. This is a typical proportion for most of West Africa, and somewhat higher than contemporary East and Southern Africa (Lesthaeghe, Kaufmann and Meekers 1989). The only way that this system can be maintained is for men to marry late, at around 30 years of age, and for women to marry much earlier (Caldwell 1963; Goldman and Pebley 1989). It is not anticipated that post-adolescent males remain virginal for 15 years. Another institution also adds to the male demand for sex outside marriage. Traditionally in most of sub-Saharan Africa women abstained from sexual relations for long periods after childbirth so that babies' lives would not be endangered by short birth intervals. Again, society did not really intend husbands to do likewise. When we worked in Ibadan City, Nigeria, in 1973, husbands spent 50 per cent of their married life without sexual access to a wife, and monogamously married men spent 60 per cent of their marriage in this state (Caldwell and Caldwell 1977). At that time in Ibadan, a not atypical population, delayed marriage for men and postpartum sexual abstinence for women meant that at any given time three-quarters of all ever-married men with a wife of reproductive age had no access to a sexually active wife.

Traditional society had met men's sexual needs in several ways: unmarried young men had discreet access to the wives of their older brothers or the younger wives of their fathers (Caldwell, Orubuloye and Caldwell 1991). Married men with abstaining wives had even more discreet access to other women, usually married; often the relationship was with the same woman for years, and not infrequently a younger wife of an old polygynist. In the twentieth century the system crumbled. Missionaries saw relationships within the extended family as akin to incest. There was cash to be earned building docks, roads and railways and working in mines and on plantations. Commercial sex became available on a large scale, and STD levels, and much later HIV/AIDS, rose steeply. Colonial officials wondered why the European imperium had brought with it an explosion of sexual and sterilizing diseases (see Balandier 1970: 122–128, 190–200).

Field work

Our first need was to develop methodologies for studying sexual relations, especially multiple ones both successively and, more importantly, concurrently. Most of the original work was done in what is now Nigeria's Ekiti State. It turned out to be very different from earlier work on fertility and its control. This time we set up no village meetings for presentation of the questionnaire but explained it only to key trusted people to whom interviewees could go for reassurance. The sample was dis-

persed rather than clustered. Only a few interviewees exuded the right confidence and understanding; the others were moved to other work. Above all we identified ourselves with the local state university, for which the people had fought the Federal authorities to prevent closure, and which they trusted. We convinced them that we would not give individual evidence to the churches or government, regarded as killjoy institutions forever trying to diminish sexual pleasure. Women had to be interviewed more tactfully than men because they had more to lose by their testimony becoming known (Caldwell, Orubuloye and Caldwell 1998).

We found the kinds of level of multiple sexual relations that we had anticipated (Orubuloye, Caldwell and Caldwell 1991). Some of the findings were not very different from those found in later surveys of American, French and British populations. Five-sixths of males and two-thirds of females had had sexual relations with three or more different partners during a lifetime. Where the African figures were relatively high was at the extremes and in the current relationships of married people. Over half the men and more than one-quarter of the women identified lifetime relationships with ten or more persons. Among married persons the most recent sexual relationship had been with a person other than a spouse in the case of 60 per cent of monogamously married males, almost 40 per cent of polygynously married males, 20 per cent of monogamously married females and 40 per cent of polygynously married females. The high level of extramarital sexual relations among polygynously married females is explained by the lack both of economic support and, often, of marital sexual relations among the youngest wives of old men. Indeed, outside relationships are often tacitly accepted by the old men provided that they are discreet. We assembled the data provided by all our interviewees on their most recent sexual act into a kind of census of such acts showing that 40 per cent had been between spouses, 25 per cent between unmarried persons, 20 per cent between a married and a single person, and 15 per cent between two married persons not married to each other (Orubuloye *et al.* 1991). Later, not dissimilar patterns were found across sub-Saharan Africa. A picture emerged of a pattern that could sustain an almost exclusively heterosexual epidemic.

Nevertheless, much depended on how risky were the sexual activities of the partners and how many of them were commercial sex workers with large numbers of different partners. Men were reluctant to identify more than a small proportion of their partners as prostitutes because in most commercial relationships the partners knew each other, socialized to a very considerable extent, and had quite a high degree of (perhaps misplaced) trust in each other. The problem is that most sex outside marriage, and some within it, has a transactional component, usually in the form of gifts but sometimes of monetary or other help. Indeed, for males to ignore that component is immoral. To undertake meaningful research we had to concentrate not on finding descriptive terms for the partners, often regarded as pejorative, but on measuring the transactional component. For most males it is considerable, averaging around US\$7 per month or around one-third of the Nigerian per capita income at that time. In many cases relations with extramarital partners were the equivalent of the more formal polygynous union and implied similar economic responsibilities. Only 14 per cent of female partners believed they were practising commercial sex, and these were the partners who insisted on payment per sexual episode at the time (Orubuloye, Caldwell and Caldwell 1992).

The question of self-identification of activities is even more complex than this,

as was shown by both individual interviews and a survey of nearly one thousand commercial sex workers across the country (Orubuloye, Caldwell and Caldwell 1994). The relatively relaxed attitude towards sexual activities in much of sub-Saharan Africa meant that there was a ready flow of girls mostly from rural areas to the bars, nightspots, hotels and brothels in the larger towns and cities. Most were excited by the prospect, and most were to remain excited by what they had done for the rest of their lives. They were not clear about what they were going to or had arrived at because they were involved in multiple activities including serving and sharing drinks and dancing. They knew many of the regular patrons. Their level of education was above the rural average and most would have felt more degraded by taking up the traditional activities of rural women, trading and farming. On average they earned more than public servants. By their late 20s most had returned to their village, set up a small business, and married. Unlike such women in earlier Europe or much of contemporary Asia, they did not thereafter spend their time feeling that they would be ruined if their past caught up with them. They felt little fear of AIDS, because they did not encounter it; sick young women quietly slipped away and went home.

Commercial sex was not the only high-risk occupation (Orubuloye, Caldwell and Caldwell 1993c). Many long-distance truck drivers had semi-regular partners at their various night stops, usually not facing the fact that these women also had relations with other drivers. Commercial sex, like the provision of food and the repair of vehicles, was the way that the poverty-stricken villages of Nigeria's Middle Belt tapped into the greater prosperity of populations to their south and north. We also studied the young women who were itinerant sellers of food and other goods in lorry parks, and who were assumed by travellers, usually correctly, to be sellers of sex as well.

Our findings did not satisfy the statisticians and demographers who were modelling the epidemic and its progress. They asked for data on real sexual networking, the chains of sexual contacts. We went as far as getting information (without individual identification) on each of the respondents' partners, especially about their socio-economic characteristics and their likely number of sexual partners (Orubuloye *et al.* 1992). On the latter point our respondents were often woefully ignorant. But, in contrast to the STD tracing of the American Centers for Disease Control, we did not then go to the partners to tell them that they had been identified and that we wished to locate their other partners. In any case, such chains would usually have soon ended with prostitutes who did not know their partners' addresses or regarded it as their professional duty to claim ignorance.

We examined condom use and women's control over their own sexual activity (Orubuloye, Caldwell and Caldwell 1993a). We found that West African women usually could refuse sex or leave their husbands if the husband had an active STD or was HIV-positive and refused to use condoms. But most women could not identify male STDs or had no opportunity to do so because sexual relations took place only in the dark. Few men knew their HIV status and only a small proportion infected with STDs or AIDS told their wives or other partners. Most prostitutes would prefer to use condoms, not only to avoid infection but to distance themselves from their clients (see Varga 1997). But in all other relationships men were hostile to condom use, and both men and women knew that any demand for condom use would be taken by their partners to be an accusation.

We increasingly concentrated on two key matters. The first was the belief systems that led people to take such horrendous sexual risks even for economic gain. The second was the light that could be thrown on the epidemic by the unusual geographical pattern of infection in the region.

Sub-Saharan Africa exhibits far higher levels of polygyny than anywhere else in the world. Inevitably, this implies that men cannot be satisfied by one woman. Most men and women believe that men are biologically programmed to need more than one woman (Orubuloye, Caldwell and Caldwell 1997). Most men see sexual relations as the result of a sudden biological need that must be assuaged (Caldwell, Orubuloye and Caldwell 1999). When we interviewed men who had just experienced commercial sex, they rarely spoke of seeking pleasure but of being driven by an uncontrollable urge, often stimulated by alcohol.

Why do men (and women) take the risk? Among men, as just noted, AIDS is thought to be inevitable. In another sense, both men and women believe in its inevitability. There is a strong sense of predestination, especially in West Africa, manifesting itself in a belief that the timing of one's death was written before one's birth (Fortes 1959; Caldwell, Orubuloye and Caldwell 1992). There is also a feeling that the fearless and brave, often shown by the recklessness of their sexual activities, are protected from danger, and will succumb to it only if they lose their nerve. Perhaps more important is the ascription of disease causation to witchcraft, especially to enemies (often relatives), employing occult forces to harm a person. This is particularly the case with AIDS, a mysterious malady with variable symptoms, and unamenable to treatment by modern medicine. There is often a disregard of danger, common and understandable in high-mortality societies. When told that AIDS would kill within a decade, many of our discussants said that this was hardly threatening because they would probably die of some other cause within that period. The extreme caution about safety that is found in low-mortality countries is to a large extent the by-product of the low mortality itself. What is ironic is that the African situation had changed quite dramatically. Although sub-Saharan Africa's life expectancy at birth was 35 years in 1950, without AIDS it would now have reached 55 years (comparable to Australia in the early years of the twentieth century) while in Southern Africa it would have reached 68 years (Australia in the late 1940s). Instead, in sub-Saharan Africa life expectancy is now 48 years and in Southern Africa 46 years (comparable to Australia in the 1860s) (United Nations 2001; McDonald, Ruzicka and Pyne 1987: 60–61).

The wider picture

The geographic pattern of AIDS provided more evidence of susceptibility to AIDS infection (Caldwell and Caldwell 1993). The epidemic first appeared in Rwanda, Burundi and Uganda, countries of the Great Lakes area of central Africa. It seemed logical that the real epicentre might be immediately to the west in the high-sterility area of Middle Africa, known to have high rates of STDs and therefore presumed to be characterized by very high rates of high-risk sexual activities. It was presumed that low levels of medical care had hidden the outbreak or perhaps origin of the epidemic there. But later surveillance did not reveal a high level of HIV/AIDS in the infertility belt. Furthermore, the epidemic did not spread in concentric circles around Middle Africa, but became consolidated in a north–south group of countries

(the Main AIDS Belt) from Rwanda and Uganda through Kenya and Tanzania to Malawi, Zambia and Zimbabwe.

The breakthrough came in 1989 when a University of Manitoba/Kenyatta Medical School group working in Nairobi realized that there were much lower HIV levels among the Kikuyu ethnic group of Kenya, who practised male circumcision, than amongst the Luo who did not. It appeared that uncircumcised men were more likely to be infected by HIV because they were uncircumcised, and also more likely to be infected by a powerful cofactor for HIV infection, chancroid. An American group of demographers, statisticians and anthropologists consolidated the observation of lack of male circumcision as a causal factor for HIV, using HIV surveillance data from the US Bureau of the Census HIV / AIDS Surveillance Database, and circumcision status from an expanded version of George Murdock's 1967 *Ethnographic Atlas*, publishing in 1989 in the journal, *AIDS* (Bongaarts *et al.* 1989). The Canadian/Kenyan group drew from the same sources, publishing the following year in the *International Journal of Epidemiology* (Moses *et al.* 1990).

Although this breakthrough was sufficient to lead one of the American demographers to leave the field, finding it no longer challenging as the major mystery had now been explained, the papers almost disappeared from sight. However, we were convinced of their value, partly because we had begun working through Murdock's *Ethnographic Atlas* looking for patterns. Part of the reason for the lack of impact of the papers was probably that they were brief, in conformity with the demands of medical journals, and could not discuss the reliability of their data sources at any length. We corresponded with both groups, checked through all the Murdock source material and added to it, explored the nature of the surveillance material, and published in 1993 at much greater length in the social science journal, *Population and Development Review* (Caldwell and Caldwell 1993) and in 1994 in the proceedings of a conference (Caldwell and Caldwell 1994). Even this failed to reach the influential members of the medical community, and Pat Caldwell and I did not achieve this until 1996 when we published in *Scientific American* (Caldwell and Caldwell 1996). Only within the last 12 months have UNAIDS, WHO, USAID and other parts of the health establishment shown signs of coming aboard, although the Centers for Disease Control began to move earlier. Physiological evidence, such as that of Szabo and Short (2000), is also now becoming available. We predicted correctly on this basis that HIV / AIDS would move more determinedly into Southern Africa, especially into Zimbabwe, Botswana, Namibia and KwaZulu Natal,⁴ but failed to foresee with what intensity this would occur.

There were other determinants too: the principal one was urban-rural residence. In the early stage of the epidemic, the WHO AIDS program used (for modelling purposes) an urban-rural ratio in HIV prevalence levels of ten to one, though this is no longer appropriate. In Uganda the prevalence level falls continuously as the size of the residential centre falls (Health Studies Branch 1993). Among the smallest villages those with the higher prevalence levels are those with a bus stop. In a rural longitudinal survey area in Uganda, a remarkable proportion of infected persons are returners from the towns, especially Kampala (Nakiyingi 1995; Nunn *et al.* 1995). In socio-economic terms it is a fairly democratic disease, not closely tied to poverty. Poorer young women have somewhat higher HIV levels because they are more likely to need to sell sex, and economically better-off men have somewhat higher levels because they are in a better position to buy sex (Seeley *et al.* 1994).

Why, then, do parts of sub-Saharan Africa have a major heterosexual AIDS epidemic? I suggest its conditions are as follows. First, there is a high level of multiple sexual partners, especially parallel ones. Second, a significant proportion of men's extramarital sexual relations are with prostitutes. Third, most sexual relations, even the most commercial, take place without the protection of condoms. This condition is aggravated by alcohol consumption and by adherence to incorrect theories about the causes of AIDS. Fourth, the health system, being the world's poorest, is partly the cause of the world's highest level of untreated, ulcerating STDs acting as cofactors. Fifth, whole ethnic groups do not practise male circumcision.

Contemporary patterns and policies

The AIDS epidemic seems to have now peaked in most of East Africa with HIV prevalence levels among adults (15–49 years) at 14 per cent in Kenya, 11 per cent in Burundi, Rwanda and Ethiopia, and 8 per cent in Tanzania (UNAIDS/WHO 1999). Life expectancy in these countries is 8–17 years below what would be expected without the epidemic.

Two changes in the 1990s were of major importance. The first was that the epidemic moved south and unexpectedly and unpredictably reached new heights in Southern Africa. By the end of the decade, adult prevalence levels were 13 per cent in Mozambique, 16 per cent in Malawi, 20 per cent in Namibia, Zambia and South Africa, 24 per cent in Lesotho, 25 per cent in Zimbabwe, and 36 per cent in Botswana (UNAIDS/WHO 1999). In Botswana life expectancy had halved and in South Africa it had been lowered by almost 20 years (United Nations 2001: 12–16). The peak in South Africa is not expected for at least another five years.

The second change was a decline in HIV levels in Uganda to 8 per cent from an earlier level of 10–12 per cent. No one quite knows why this change occurred but it is a change of the utmost importance. Credit is being given to behavioural change, particularly fewer sexual partners, especially high-risk ones, among the young, but the evidence is sketchy. Certainly, the country, under President Museveni, has had unusually good leadership in the battle against AIDS. There was little evidence that infection had been countered by high levels of condom use. There remained the possibility that the epidemic was just beginning to burn itself out, partly perhaps because of higher mortality among those with the riskiest sex lives. Such a suggestion receives support from the seeming levelling-off of prevalence levels in other parts of East Africa. Uganda, together probably with neighbouring Rwanda and Burundi, had experienced the longest high-level epidemic in the world, and that epidemic is not over yet, for Uganda's adult HIV level is still four times that of Thailand and fifty times that of Australia. The other great epidemics, plague, smallpox, cholera and Spanish 'flu, were characterized by periods from infection to the symptomatic stage of the disease measured in days, and usually the outbreak in any specific locality lasted for only a few weeks. In contrast, the latency period of AIDS is almost a decade and the epidemic has persisted at a high level in East Africa for over 20 years. Statistical modellers have encountered great difficulties in plotting the course of the epidemic.

For two decades now, the only real weapon against the African epidemic has been behavioural change, in the form of either safer sexual partners or greater use of condoms. The messages about the development of vaccines are reasonably opti-

mistic but so they were a dozen years ago. There is limited use in some places of antiretroviral drugs to reduce the vertical transmission from mother to foetus or baby, and even more limited use of antiretrovirals by those who are seropositive. In the late 1980s it was believed that information and education were the answer: this is one reason why we concentrated first on getting an accurate picture of the behavioural and social situation. This has not proved to be the case. Field research and national surveys now show that in the worst affected countries nearly everyone understands what behaviour makes infection more likely, and that death results from infection.⁵ Nevertheless, for all the reasons outlined above, there has been little behavioural change. In spite of all the economic, political and health disasters the population appears to remain cheerful, seemingly the happiest people in the world. In a sense, this is the heart of the problem.

In contrast, the Australian gay community in the 1980s, with government and other help, halted and then reversed the rise of HIV among their ranks (Dowsett 1999; Caldwell 2000: 119). In the years before the malaise struck, they had convinced their members and much of the rest of society that theirs was merely an alternative form of sexual behaviour on a par with other forms. When the epidemic arrived they were able to take the attitude that they were at most risk and that it was up to homosexuals to minimize that risk, and the duty of government to assist in that endeavour. Where governments were less responsive, as in the United States, there were protests and demonstrations.

This has not been the African experience. Individuals feel guilty and responsible, and do not object to sermons branding them as such. In the main AIDS belt of East and Southern Africa, few (north of South Africa) attacked government and few demanded that it should do more, even though the depletion of population rivalled the situation on the Eastern front in World War II. The reason is that no one justifies the African sexual system, and most take AIDS deaths to be deserved.

Part of the reason is the way African non-marital heterosexual activity has always been treated, namely by discreet silence (P. Caldwell and J. Caldwell 2000). It is not a *macho* society where men boast of their sexual conquests, but one where it is practically impossible to discuss sexual activity across generational or gender barriers. AIDS deaths are rarely identified as such, and this makes the battle against the disease very difficult. The press reports WHO or Ministry of Health statements, but does not identify individuals with AIDS. Mourners at funerals are not told that the deceased died of AIDS. There is an unreality about the presence of the disease.

Some of this stems from the traditional culture, but that has been reinforced by the subsequent missionary experience. The main AIDS belt of East and Southern Africa is now strongly Christian (63 per cent Christian, 12 per cent Muslim, and 25 per cent African traditional religions, see *Encyclopedia Britannica* 2002) and mostly fundamentalist in orientation. The fundamentalism arises from the fact that rapid conversion can hardly be carried out by an appeal to logical argument but rather by revelation and a certainty about God's truth. That truth encompasses the belief that sexual activity should be confined to the Christian marriage and that any other sexual activity is sinful and very likely to be punished. Most African preachers hold that AIDS is a divine punishment (Orubuloye, Caldwell and Caldwell 1993b). Most Africans who find that they are HIV-positive or have AIDS feel guilty, not outraged, and hardly any will reveal their condition except to their closest relatives when there is no other way of getting help. The Catholic and Anglican bishops of Nairobi

successfully opposed the government introducing a sex education course into schools in a country with one of the world's highest pregnancy-induced drop-out rates among girls in secondary and upper primary schools. The Pope has made it clear in visits to Uganda that even among couples now exclusively sexually faithful to each other but where only one is HIV-positive there must be no use of condoms, but either abstinence or sexual activity with a high risk of infecting the HIV-negative partner.

Governments are silent for a variety of reasons, summing to the fact that they have little to gain and much to lose by assuming leadership. If they did address the issue, they would break the silence on sexuality and associate themselves with unpleasant things. They would find themselves mainly pitted against young men, the most dangerous group in the community. They would probably fail. They might well be excoriated by the powerful churches whose laity would hear their spiritual leaders criticizing the governments and their policies. Thus, in spite of strong international pressure, no national leader attended the 1999 Lusaka African Regional Conference on AIDS, not even the opening or closing sessions, and not excluding the President of Zambia who lived close by. African leaders, with the exception of Yoweri Museveni, do not make major pronouncements about AIDS as would be expected of any country's leadership facing a total war situation. Nor, in most countries, do their newspapers and electronic media reflect the situation.

Can anything be done to halt the epidemic besides waiting for the vaccines? Strong government leadership would certainly help, as Uganda's experience probably shows. The heads of state might adopt a Churchillian role. Some recognition, even by the churches, of the reality of the African sexual experience might be of assistance. A more down-to-earth approach by the press to AIDS deaths could bring home the truth.

There are also very practical approaches that might have a decisive impact. Epidemics spread by a multiplier effect whereby each infection results subsequently in more than one further infection. This chain is susceptible to attack at its weakest points and success is within sight if the multiplier of infection can be reduced to even a little below one. There are three ways in which this could be effected, apart from the continuing effort to reduce high-risk sexual activity.

The first way is by using the Thai approach, providing condoms for use in commercial sexual relations and enforcing their use on pain of closure of the premises involved. This is more difficult in Africa where prostitutes are usually independent operators, renting a room for their use. But they often rent rooms in specific buildings with owners who could be susceptible to pressure. Certainly the nightspots, bars and hotels are easily identified. The police or health inspectors might seek bribes so as not to carry out enforcement but this is an administrative challenge which could probably be overcome.

The second way is by finding methods of getting condoms to adolescents who are the group least likely to be able to obtain them and most likely to become infected. The majority of infected wives were infected before rather than after marriage. Even where government family planning clinics have been told to provide adolescents with condoms on request, the system hardly ever works (Caldwell and Caldwell 2002). Successful distribution would probably have to be through youth groups, but the conservative adult opposition to this would be immense.

A third and more expensive approach would be to put many more resources into

the early detection and cure of STDs, especially those that serve as cofactors for AIDS. There is the problem of rapid reinfection by these diseases, which are far more contagious than HIV, but the Mwanza project in Tanzania seems to have shown that the effort could be worthwhile.

These are not competing solutions but complementary ones, which together might begin to overcome the epidemic. Perhaps 35 million Africans are already dead from the epidemic, or being infected are doomed to die. Even if the epidemic is beginning to behave like other epidemics which eventually burn themselves out, the number could rise to 100 million before that happens.

Acknowledgments

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Notes

- 1 During the period 1989–91 the research organization was known as WARGSN (the West African Research Group on Sexual Networking), with I.O. Orubuloye as Coordinator, and funding successively from The Australian National University and the Rockefeller Foundation. From 1992 the term SAREC Research Program was employed.
- 2 UNAIDS/WHO (1999) estimates of adult (15–49 years) HIV levels were for the Democratic Republic of the Congo 5 per cent and Gabon 4 per cent in contrast with Rwanda 11 per cent, Burundi 11 per cent and Uganda 8 per cent.
- 3 Each of the three collections contains copies of all the source materials with markings showing the sentences from which the conclusions for the *Ethnographic Atlas* were made.
- 4 At an IUSSP Scientific Workshop in Annecy in 1993 on the basis of a paper presented (see Caldwell and Caldwell 1993, map of ethnic groups traditionally not circumcising males).
- 5 Demographic and Health Surveys taken during the second half of the 1990s in East and Southern Africa.

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PERSPECTIVE
THE AFRICAN AIDS EPIDEMIC: REFLECTIONS ON
A RESEARCH PROGRAM

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Errata

Page 175, lines 41–42. Clarification of the statement: ‘the chance of an HIV-positive man infecting a woman is around 300 to one, and of an HIV-positive woman infecting a man 1,000 to one’. These chances are expressed as betting odds (against), and are more clearly expressed as probabilities of ‘around one in 300 ... and one in 1,000’.

Page 179, lines 26–27. Replace ‘three-quarters of all ever-married men’ with ‘threequarters of all adult men’.