The challenge of HIV/AIDS in Sub-Saharan Africa

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ABSTRACT — At the end of 1998, an estimated 67% of people living with HIV/AIDS in the world were in Sub-Saharan Africa — some 22.5 million people. The challenges posed by the HIV/AIDS epidemic in this resource-poor region are enormous. The most important is to reduce the number of new infections: simple interventions such as barrier methods of contraception and better treatment of sexually transmitted diseases must be implemented now whilst waiting for an effective vaccine. There is also a need to understand more comprehensively the clinical spectrum and natural history of the disease in the region. However, with an ever-growing demand for care caused by HIV/AIDS, probably the most compelling yet insoluble challenge is how to provide wider access to very costly specialist services, including antiretroviral therapy.

Sub-Saharan Africa is bearing the brunt of the global HIV/AIDS epidemic. The most recent figures released by the UNAIDS joint co-sponsored programme estimated that, at the end of 1998, 33.4 million adults and children were living with HIV/AIDS; and that of these, 22.5 million (67%) people were resident in Sub-Saharan Africa. Given that this region has only about 10% of the world’s population, but is the poorest in almost all economic or social indicators used, the disproportionate impact of the epidemic is clear. Furthermore, HIV infection is not uniformly spread over the region. Some countries have very few cases, and less than 1% overall of the adult population is HIV positive. In others, over 20% of the total population is infected with the virus — and almost all of these people will die prematurely as a direct consequence of HIV. Even within countries there is great heterogeneity in rates of infection. Almost everywhere urban populations have higher rates than rural populations; some occupational groups such as truck drivers and migrant workers are particularly at risk; and women tend to get infected earlier than men for biological and sociocultural reasons.

The consequences of the unprecedented change in the burden of disease caused by the HIV epidemic are now appearing. The most obvious, and frankly terrifying, manifestation is the impact of HIV on life expectancy and crude mortality. The hard-won gains in rising life expectancy seen across Africa over the past three to four decades are being wiped out in a matter of years. Most of those who are dying are at the age of peak economic activity, with families and extended households to support. The consequences of this are unpredictable, but threaten to be grim indeed as (at least in some countries) so many productive members of society die over a relatively short time-span. Another frightening aspect is the estimated lifetime risk of dying from AIDS, which is now over 50% in Zimbabwe and Zambia, and in excess of 40% in Malawi and Botswana.

The supreme challenge — reducing new infections

The supreme challenge remains: how can the number of new infections be reduced? However it is viewed — by health economists, public health practitioners or service deliverers — the single most important problem is how to slow the epidemic by limiting the onward spread of HIV. One relative success story of the fight against HIV/AIDS is the wealth of knowledge generated about how HIV is transmitted, and in particular the risks associated with heterosexual sex.

Heterosexual infection is the most important mode of transmission in Sub-Saharan Africa and concurrent sexually transmitted diseases (ulcerative and inflammatory) clearly increase both the risks of onward transmission and of being infected. This simple epidemiological fact is of great importance because relatively basic biomedical interventions that are capable of reducing the large, but often unrecognised, burden of sexually transmitted disease (STD) in resource-poor communities will probably have a considerable impact on HIV transmission. Even with some contradictory results from different studies using syndromic STD treatment or mass community therapy, the chances that well managed and resourced programmes to counter sexually transmitted diseases will have substantial impacts is high. In health economics terms, these represent a very good investment in disability-adjusted life years gained for a modest investment.

Another extremely cost-effective intervention is the general promotion and use of condoms. While it is easy to ignore such a simple, low-technology approach, the truth is that if an HIV vaccine with anything approaching the condom’s efficacy were produced, it would be hailed as a great scientific triumph. However, for condoms to have an impact sustained changes in sexual behaviour and practices are needed. These are far more complex and challenging than a mass vaccination scheme, but equally valid.

Issues far beyond the health sector — human rights, knowledge and attitudes about sex, social cohesion, the general status of women (and in particular their literacy
levels), migrancy, poverty and income levels – play a part in disease transmission. Influencing this dynamic clearly requires responses far beyond the ministry of health. It is as important for public health practitioners to appreciate this as it is for technocrats within the ministries of education, law and employment to take into account HIV/AIDS. Effective control campaigns really do require a multi-sectoral approach.

There are some convincing signs that the epidemic is slowing down in some parts of the region, and that HIV seroprevalence is stabilising or even falling somewhat. The most compelling data come from Uganda, a country that has been particularly badly hit but has also led the way in an open and non-judgmental approach to HIV. Rates of HIV seropositivity in pregnant women in the capital city, Kampala, which were 30% a few years ago, may be stabilising at 15%–20%. While this may be evidence of containment, it still implies considerable transmission, with a seroincidence of about 1% annually. Such figures remain, at best, a relatively qualified success, and far more needs to be achieved to reduce new infections.

In some of the countries of Western Africa such as Senegal, low levels of HIV prevalence in adults have been maintained for about a decade, despite many circumstances highly conducive to appreciable and sustained transmission. Why the threatened epidemic has not materialised is not well understood. Nor is it clear whether transmission will eventually increase. Despite these few examples, the overall trend for the region still indicates an increase in the number of new infections year on year. Because many infections are relatively recent, most of those who are HIV seropositive remain in relatively good health, and we are still a long way from seeing stability in demand for health care and a steady-state for serious disease and death, where the number of new cases equals the number of HIV/AIDS related deaths.

Need to describe the natural history and spectrum HIV/AIDS

The second challenge has been to describe more comprehensively the clinical spectrum and natural history of disease in resource-poor environments. It has long been obvious that only a limited degree of extrapolation is possible from the natural history data and information about survival and the spectrum of disease derived from affluent North American cohorts. However, despite the size of the HIV/AIDS problem in Africa, surprisingly little work has been published in this area, and major gaps in our knowledge exist. Without a full understanding of HIV/AIDS disease, any care initiative runs the risk of being a partial response, with as many problems excluded as included within the specific intervention.

Our clinical studies in Uganda have yielded important findings. Here a large cohort of seroincident HIV-infected adults living in a holoendemic malaria area have been clinically followed-up extremely carefully. Falciparum malaria has emerged as one of the leading clinical problems related to HIV. Not only do rates for malaria fever increase sharply with worsening HIV status, densities of parasites also rise considerably with HIV immunosuppression. Other groups in East and Central Africa are reporting similar findings in pregnant women, so that the growing optimism that the critical global malaria situation has not been affected by the HIV/AIDS epidemic is misplaced. Given the supreme importance of both HIV and malaria in Africa and across the tropics, it is sobering to consider just how long it has taken for such clear associative data to emerge.

Because survival data from Africa are relatively limited, there has been controversy over the natural history of HIV/AIDS in Sub-Saharan Africa, and in particular why survival seems to be shorter than it was in the West before any major advances in treatment were made. Many claims have been made for the rapid progression of the disease: high rates of tuberculosis, untreated sexually transmitted diseases, immune activation from intense helminth exposure and malaria parasitism accelerating immune decline. We have long argued that individuals do not die more rapidly, but prematurely, early on in the course of a normal disease progression, for two simple reasons outlined below.

In the first place, immunosuppressed individuals living in resource-poor communities have very different circumstances to contend with from people living in affluent suburbs in the West. Exposure to high grade, virulent pathogens is high in slum areas where tuberculosis, acute respiratory infections, diarrhoeal diseases and borderline malnutrition are endemic – certainly far higher than in relatively sanitised and affluent US neighbourhoods. Thus early pre-AIDS morbidity with acute bacterial (Streptococcus pneumoniae and non-typii Salmonellae) and mycobacterial (M. tuberculosis) infections is high, and far higher than that seen in rich industrialised regions. In the second place,

**Key Points**

**Across Sub-Saharan Africa the HIV/AIDS epidemic is causing unprecedented suffering and premature death; and generating a profound change in the burden of disease**

The greatest challenge is to reduce the numbers of new infections, and effective interventions such as barrier methods of contraception and better treatment of sexually treated diseases are increasingly being promoted.

The clinical spectrum of disease remains poorly described; recent work suggests that falciparum malaria is in fact associated with HIV-related immunosuppression.

There is a rapidly growing demand for HIV/AIDS care and although service collapse has been predicted some hospitals appear somehow to be coping.

The most insoluble challenge is how to widen access to high-cost HIV/AIDS specialist services in resource-poor environments.
once a person falls sick, health care is often inaccessible, generally unaffordable, and of limited effective quality. Few sick people using poor-quality services survive long enough to develop the classic AIDS-defining opportunistic infections that were the hallmark of full-blown AIDS in the USA and Europe.

Early, premature death, observed in Uganda and our own unpublished work, is the main factor for poor survival in resource-poor communities. This has extremely important consequences for health services. There is little point or justification for any widespread AIDS treatment initiative if many patients are dying with early and, at this stage, still treatable and curable problems. The most obvious example is seen with tuberculosis. Tuberculosis can be the leading cause of death in HIV-infected adults in countries where tuberculosis services are poor, but when standard basic care services are provided, HIV/tuberculosis deaths become far less common.

Provision of effective tuberculosis care services should therefore be the leading entry point for more open and successful HIV/AIDS care in both the hospital and community. The facts that this care is not provided in many centres and that patients continue to die reflect a major lost opportunity. There is little point in widening access to antiretroviral treatments and drugs for opportunistic infections if the more basic elements of comprehensive HIV/AIDS care are not in practice.

Coping with the unprecedented changes in demand for care

Coping with the unprecedented change in the burden of disease and the increase in demand for care caused by the HIV/AIDS epidemic constitutes a third challenge for Africa. These changes are without parallel in modern society; there are no models or past experiences to guide or to learn from. For the health sector, the problems are twofold:

- Coping with an ever-increasing demand for health care caused directly by HIV/AIDS, when other demands for care have not diminished in any way.
- Staffing and managing health facilities in high-prevalence areas where increasing numbers of trained health professionals are becoming ill and then dying from (sexually rather than nosocomially-acquired) HIV infection.

I will concentrate on the first of these problems: demand for care. At present there are few data on what is happening on the staff-supply side of the equation; and there is marginally more knowledge about the impact over time of HIV/AIDS on hospitals.

Our retrospective analysis of hospital records over the past eight years in one rural district hospital in KwaZulu Natal shows the staggering speed and force of HIV transmission in the region in less than a decade. It points out the impact of a changing burden of disease and shows that tuberculosis, then clinical AIDS, are the main problems. This study suggests that there will be grave problems as the demand for services seems to rise exponentially. The current HIV seroprevalence in patients admitted to medical wards now seems to be more than 50% (A Reid, S Drysdale, D Wilkinson; personal communication) and may be even greater because clinical AIDS surveillance misses much of the burden of HIV-related disease.

Hospital services may well collapse under the rising demands for care caused by the HIV/AIDS epidemic. In Nairobi, a doubling of HIV/AIDS related admissions was seen in 1992 compared with three years previously, and with increasing competition for admission HIV/AIDS patients were crowding out and displacing other sick patients. However, predictions of a worsening situation were unfounded.

When a third cross-sectional study was carried out in 1997, using methods similar to those in the two previous studies, several unpredicted changes emerged. Considerable differences were seen in the clinical profile of patients seeking care and admitted to hospital; fewer AIDS or chronically sick patients were admitted. Even though total admissions rose sharply, so that bed occupancy was nearly 190%, overall mortality fell, irrespective of the patients' HIV status. Health-seeking behaviour has changed over the years. With more awareness of AIDS, there is often an assumption that all chronic illness is HIV-related. Since stigmatisation is still a problem, many carers seem to have decided that it is not appropriate to bring patients with AIDS-like illnesses to hospital.

Interpretation of these observations might suggest that the hospital was performing more efficiently between 1992 and 1997, with almost no additional staff or finance. But what is happening to people with HIV/AIDS and (seronegative) sick people with chronic problems such as wasting and intercurrent fever? If there are few community care projects and HIV/AIDS support groups, then many chronically sick and dying patients will receive very little effective symptomatic or palliative care. Without providing services, any attempt to exclude the chronically sick from the acute care services will be tantamount to dumping them in the community. There is then compelling need and sense in providing community care to reduce overcrowding in hospitals and to cater for the pressing needs of the chronically sick, irrespective of their HIV status but accepting that most chronically sick will have underlying HIV infection.

There is now a need to address the requirements of those infected with HIV/AIDS across the spectrum of illness, and to recognise that the needs vary according to the stage of disease. The critical issue is increasingly how these services can be set up and financed, when health budgets across Africa are so limited and often seem to be contracting rather than increasing. There are no clear answers. One approach is to promote a hierarchical response to the provision of care (Table 1). With more resources a higher level of services can be expected and implemented. A further success of the response to HIV/AIDS across Sub-Saharan
Table 1. Hierarchy of responses to HIV/AIDS in Sub-Saharan Africa.

| Level of care                      | Services                                                                 |
|-----------------------------------|--------------------------------------------------------------------------|
| Basic core services               | Voluntary counselling and testing                                         |
|                                   | Effective HIV prevention                                                  |
|                                   | Information and education                                                 |
|                                   | Access to PWA support groups                                              |
| Improved support for the delivery of essential basic healthcare services | Effective tuberculosis control (DOTS)                                     |
|                                   | Better primary health care                                                |
|                                   | Strengthened basic hospital care                                          |
|                                   | Community/home care                                                       |
|                                   | Strengthened basic hospital care                                          |
| Specialist HIV/AIDS services:     | Access to appropriate drugs                                              |
| Opportunistic infections          | Provision of diagnostic facilities                                        |
|                                   | Specialised clinical teams                                                |
|                                   | Disease-specific prophylaxis                                              |
| Antiretroviral treatment          | Access to antiretroviral drugs                                            |
|                                   | Appropriate monitoring of treatment                                       |

PWA = person with AIDS; DOTS = ‘directly observed treatment, short course’ strategy.

Africa is that most countries now have the rudiments of the basic core services set up in at least some areas.

Improving access to HIV/AIDS specialist services

The fourth challenge is how to provide wider access to specialist HIV/AIDS services. These services include more widespread availability in the region of effective drugs for some of the prevalent opportunistic infections. These agents do not appear on most essential drug lists because of cost. In most areas, the biggest therapeutic gap is in antifungal treatment for cryptococcal meningitis and disseminated fungaemia. Another emerging need is to deliver specific HIV disease prevention packages, such as tuberculosis chemoprophylaxis in patients with a positive purified protein derivative skin test, and perhaps antibacterial prophylaxis using co-trimoxazole. The problems here relate largely to how effectively these interventions can be delivered without jeopardising public health through increased drug resistance. Another issue concerns at whom these interventions should be directed – accepting the difficulties and costs of sustaining the delivery of any long-term prophylaxis. Sadly, pneumococcal polysaccharide vaccine does not seem to have a role in preventing HIV-related invasive pneumococcal disease and pneumonia in Africa19.

For most people living with HIV/AIDS the really important part of this challenge is how to increase access to antiretroviral treatment. The need certainly exists, and is being addressed at least partly. Antiretroviral drugs are available in most African cities and, it is believed, are being widely prescribed by private-for-profit doctors with little or no experience or training. There are no figures available on actual usage or the different ways the drugs are prescribed or taken. However, because the drugs are far too expensive for most patients to use in a standard regimen, it is reasonable to assume that many patients end up with suboptimal treatment that is regularly interrupted because their money runs out. The consequences for the individual and the public health, especially the promotion of HIV drug resistance, are obvious. Yet few governments in Sub-Saharan Africa can afford to subsidise any wide and equitable scheme to increase the availability of antiretroviral drugs in the public sector. Indeed, we have calculated that to introduce such a scheme across Africa would cost over 1,600 times the total health expenditure of the region in 199020.

Is there a solution? UNAIDS is working with four low and middle income countries to examine possible solutions. It is believed that the cost of drugs will have to fall substantially and the ways in which they are used need to change radically – perhaps with the introduction of drug-sparing combinations – before the majority of African governments can consider subsidising antiretroviral treatment. There are far too many other calls on limited health budgets for antiretroviral treatment to be considered a public good at present. In the meantime, inappropriate use will continue and will be impossible to regulate; and the greatest need for antiretroviral treatment will continue to be found in that region least able to access it because of the cost21.

Mobilising resources

The challenges posed by the HIV epidemic remain huge. While a few issues have been addressed, and considerable progress has been made in some areas, there is no denying the magnitude of the remaining challenges. More needs to be done with current resources, and much more could be done with greater resources. How exactly those resources are to be mobilised, almost inevitably from external sources in bilateral and multilateral donations, remains to be seen. If resources are mobilised, can they be used effectively and equitably so that the poor and worst affected really do benefit? What is abundantly clear is that the consequences of not doing more look increasingly daunting as the challenges posed by the HIV/AIDS epidemic in Sub-Saharan Africa continue to grow.

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**Dr Meryon FRCP and Lady Hester Stanhope**

by Denis Gibbs DM FRCP, Retired Physician

For many years, Dr Charles Lewis Meryon (1783–1877) acted as personal physician to Lady Hester Stanhope, eccentric niece of William Pitt. He joined her entourage in 1810 and for seven years accompanied her on wanderings in Europe and to the Middle East. Eventually he saw her settled in a former monastery in the foothills of Mount Lebanon, which gave him the opportunity to return to England to become MD (Oxon) and FRCP. In 1822 he responded to Lady Hester’s request to rejoin her extraordinary establishment; she had by then adopted local dress, manners and customs.

Differences with one of his patroness’s local medical men on this occasion resulted in Meryon’s early despatch home. His nature was, however, as patient and forgiving as Lady Hester’s was volatile and imperious. In response to her further earnest entreaties, he journeyed to her new home in another converted monastery on a hilltop at Djoun near Mount Lebanon. The memoirs and travels he wrote, published seven years after her death in six volumes, provide the main source of information about the life and times of Lady Hester Stanhope12.

The books are available in the Royal College of Physicians library. In the illustration shown here, which forms the frontispiece to volume II of the *Memoirs of the Lady Hester Stanhope*, Dr Meryon and Lady Hester are seen in conversation in her saloon at Djoun, while smoking their chibouques.

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