

Introduction

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By the end of 1996 the estimated number of people living with HIV/AIDS in the world was 22.6 million. Of that number, 14 million, accounting for nearly two-thirds of the total, were in sub-Saharan Africa. Nearly two decades into the outbreak, the epidemic has spread throughout the subregion with complex spatio-temporal variability within and between countries. While the epidemic has apparently peaked in parts of Uganda and the Democratic Republic of Congo (formerly Zaire), it is still rising in parts of Kenya and Southern Africa and is yet to become a major problem in most countries in West Africa. Secondly, the epidemic has become more diffused and has spread from among the initial 'high-risk groups' to the general population. Thirdly, evidence points to a possible increase in intensity in the years ahead since the co-factors (e.g. STDs, lack of male circumcision) and the forces (e.g. mobility and instability) which impel the spread of the epidemic still persist (Caldwell and Caldwell 1993; National Research Council 1996).

There is no doubt that AIDS is having a tremendous impact on the demographic, social, political and economic aspects of life in some parts of sub-Saharan Africa. However, there are uncertainties surrounding some of the consequences mainly because of the lack of adequate and reliable data (National Research Council 1996). Sub-Saharan Africa has worse demographic and epidemiological data than other major world areas, making it difficult to track the progress of the epidemic (Mann and Tarantola 1996). As a result, discussions on the socio-demographic impact of the epidemic on the sub-continent have mainly relied on estimates and models. For this reason, the Committee on AIDS of the International Union for the Scientific Study of Population (IUSSP) decided to organize a conference to bring together the current evidence of the socio-demographic impact of AIDS in Africa. Data bases for the measurement of the spread and consequences of the epidemic are modest, in both geographical coverage and length of study period. Yet, as is demonstrated in this volume, the small number of longitudinal studies of communities affected by HIV/AIDS provide a wealth of data on actual impact in their study populations and some important clues as to the possible impact elsewhere in Africa.

There is the *primary* effect of HIV/AIDS on demographic variables such as mortality, fertility, rate of population growth and age structure, and its *secondary* effect on the spread of other infectious diseases such as tuberculosis, on social structures such as orphanhood, fostering and marriage and the economy and welfare. Ten of the papers in this volume focus on the impact of the epidemic on adult mortality, fertility and household structure. The concluding contribution by John Caldwell puts the results of these papers into a broader perspective.

Adult mortality and morbidity

Data on adult mortality are scarce for most of Africa. In the absence of sound vital registration systems the principal data sources are censuses, surveys and longitudinal studies. George Bicego's paper on the use of national survey data to estimate adult mortality shows that the potential of household surveys is greater than perhaps was anticipated. He uses data from seven African countries to show that the sisterhood method used by the Demographic and Health Surveys (DHS) is a reliable indirect method of estimating adult mortality. To some extent DHS and other surveys can thus be used to estimate national trends in adult mortality; and thereby to estimate the effect of AIDS on adult mortality.

Simply ascertaining levels of adult mortality with any degree of accuracy has long proved a challenge for demographers in sub-Saharan African countries. Ian Timaeus and Andrew Nunn present an evaluation of one of the most popular indirect methods of estimating adult mortality, the orphanhood method, in the context of stable levels of HIV in a rural population. They found that the method is fairly robust provided fairly simple adjustments are made to compensate for the likelihood that seropositive mothers will transmit HIV to any future children and that these children will therefore not survive to report orphanhood.

HIV prevalence in Africa is determined by its incidence, the survival time between infection and death and the current population growth rate, as cure rates are insignificantly low. John Blacker and Basia Zaba begin from this premise to try and model the likelihood that an individual will die from HIV-related causes, given a certain level of prevalence. Using data from Kenya, they estimated that, where prevalence is under eight per cent (which implies that one person in 13 is seropositive), about 30 per cent will die of HIV-related causes. Such a figure may convince policy makers of the severity of the epidemic.

The most detailed data on the effect of the AIDS epidemic on adult mortality are derived from longitudinal studies. In a rural cohort of 20,000 in northwestern Tanzania, Ties Boerma and colleagues show that although HIV prevalence among adults between 15 and 44 years was under seven per cent, over a third of all adult deaths were classified as HIV/AIDS related. The next most prominent killer, diarrhoea, trailed far behind, causing just over six per cent of deaths. At these levels of HIV prevalence, Boerma and colleagues calculated the current probability of dying between the ages of 15 and 60 as 42 per cent for men and 43 per cent for women: about five times the likelihood commonly recorded in industrialized countries. It is argued that Africa, which already lagged behind in the epidemiological transition, will be thrown back even further compared to the other continents of the developing world.

The interaction of HIV with other diseases further complicates the mortality picture. Tuberculosis, traditionally an important killer of young adults in Africa, has been found to be the most important opportunistic infection associated with HIV infection in Africa. The case control study conducted in Malawi by Judith Glynn and colleagues shows that when under three per cent of the adult population was infected with HIV, some 17 per cent of tuberculosis was associated with the virus. But the proportion of tuberculosis associated with HIV rises dramatically with HIV prevalence. As HIV prevalence rose towards 11 per cent, nearly four tuberculosis cases in ten were related to the virus. The impact of HIV on tuberculosis is greater still, since a rise in the number of tuberculosis infections (and a lower likelihood that cases will be cured) increases the spread of the disease in the population at large, regardless of HIV infection. A better understanding of how HIV relates to tuberculosis, malaria and other communicable diseases is essential if policy-makers and service providers are to use precious resources to best effect.

Fertility

Most projections of the impact of the demographic epidemic have assumed that there will be no significant difference in the 'with and without AIDS' fertility in sub-Saharan Africa in the immediate future (United Nations 1991). However, the precise relationship between HIV infection and childbearing is important, not least because much of what we know about levels and trends of infection in different areas comes from testing pregnant women at antenatal clinics. The more we know about how HIV infection relates to pregnancy, the better idea we have of how our sentinel surveillance data relate to women in the general population. In addition, estimates of fertility among HIV infected women have a profound effect on projections of the numbers of orphans and, to a lesser extent, on child mortality rates.

In a paper that seeks to clarify the interaction between HIV and fertility, Simon Gregson and colleagues consider the possibility of a direct physical effect of the virus on the probability of conception. They also posit that changes in behaviour that result from a growing awareness of HIV and a desire to avoid infection or vertical transmission might change childbearing patterns. Behaviour change might work in both directions. Where post-partum abstinence and long periods of breastfeeding are common, women may feel these practices push their husbands into multiple partnerships and therefore increase their risk of infection. Curtailing abstinence and breastfeeding may increase fertility. Deliberately seeking to increase fertility in response to the high-mortality environment created by HIV would also increase the average number of children per woman. Where the most common response to the fear of infection is decreased sexual activity or increased condom use, behaviour change is, on the other hand, likely to limit childbearing. In high-HIV-prevalence situations, death and disabling illness will also cut down the time spent in sexual unions. Overall, Gregson and his colleagues from the Blair Institute in Harare consider that the forces reducing fertility are likely to outweigh those promoting fertility.

In the following paper Lucy Carpenter and colleagues examine in greater detail the physical relationship between seropositivity and fertility. Using data for a rural Ugandan population, they look at fertility in the seropositive over a six-year period. After adjusting for age, HIV-infected women were 23 per cent less likely to bear children than the seronegative. By contrast, they found no significant relationship between fertility and markers of previous syphilis infection. It may be that the reduction in fertility differs at different stages of the epidemic, and with different mixes of behavioural and physiological factors. These papers show that fertility is diminished even when controlling for behavioural differences. But they also reminded us that behavioural variables such as age at first sex, rates of partner exchange and coital frequency, some of which may alter in response to perception of risk of infection, can be important factors in reducing fertility in their own right.

Household composition and structure

Associated with the increase in adult mortality are likely increases in the level of orphanhood, fostering and the emergence of child- and adolescent-headed households. Given the already high adult mortality in sub-Saharan Africa, orphanhood is not a new phenomenon. Fostering has been one of the adaptive mechanisms to deal with the disruptions created by high adult mortality and other uncertainties in life. It has been common to bring up children other than one's own in most African societies. However, HIV-associated deaths have changed the dynamics and the magnitude of problems associated with child rearing. But the appearance of child- and adolescent-headed households does not necessarily mean that the extended family system has abandoned its responsibility towards the care of the children of relations. Rather, it may represent another dimension in societal dynamics as populations go through traumatic experiences. It is important to establish whether such adaptations are going to be transient. We

need long-term studies in order to put into perspective the possible life courses of the processes taking place.

Experience of HIV in the household is likely to affect people's perception of risk, so it was interesting to see quantified the difference between people affected and households affected. In a study of rural villages in Uganda's Rakai district, Joseph Konde-Lule showed that where adult HIV prevalence was 19 per cent, over 31 per cent of households were affected by HIV. Prevalence was higher among household heads than in the general population and HIV-associated deaths have more adverse consequences for the household than adult deaths not related to HIV: a greater decline in dependency ratio and more loss of household possessions were registered in Rakai.

In several rural societies child fostering was shown to be common regardless of orphanhood. Mark Urassa and colleagues use data from rural Tanzania to show that over a third of children whose parents were alive did not live with both their biological parents, and over one in ten lived with neither surviving parent. Two households in five were home to children who were neither indigenous to the household nor orphans, nearly three times as many as those housing orphans. In the population studied, orphans and foster-children seemed to fare as well in terms of health and schooling as biological children, at least up to the teen years when children not living with their birth parents were more likely to drop out of school.

In a study which examines the point at which traditional extended family mechanisms become saturated, Geoff Foster and colleagues document the appearance of child-headed households in Zimbabwe. They note that the problem is likely to be more acute in urbanized societies and those where migration is common. And it will become more acute still in the next generation, because the orphans of people who lost their own parents in the early years of the HIV epidemic will have no grandparent generation to care for them. When older children are forced to drop out of school or sell assets or sex to support younger children, they may be increasing their own vulnerability to HIV infection. Institutionalization is not the answer, but policy-makers should encourage social support for and beyond the extended family system.

Conclusion

When considering the impact of the epidemic one needs to be careful not to over-generalize the findings from small-scale studies to cover the whole of sub-Saharan Africa, which is a region of great diversity. Nonetheless the results reported here, the data collection techniques and the models used are among those that are likely to generate new challenges for demographers and epidemiologists in addressing issues of measurement and they will inform policy-makers about the structures needed for addressing some of the emerging problems. There is also a need to understand community responses as well as the survival strategies adopted by individuals and families in the face of HIV/AIDS morbidity and mortality. These will have to be obtained from localized detailed studies such as those reported in this volume.

The largest HIV/AIDS epidemic has occurred in a continent which is least able to deal with its ramifications. Sub-Saharan African countries constitute the bulk of the countries in the bottom third of the UNDP human development index. For instance, seventeen of the last 20 of the 174 countries in the index are in sub-Saharan Africa. Unfortunately these countries, which can least afford the cost of prevention and treatment, are the most affected. But as pointed out by Caldwell, African countries have shown a tremendous ability to shoulder adversities. Some of the changes in household structure are likely to be transient. Only through studying the dynamics of traditional and new coping mechanisms can we help the development of appropriate responses to mitigate the severe consequences of the AIDS epidemic in sub-Saharan Africa.

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Preface

The papers in this volume are a selection from a Conference on the Socio-demographic impact of AIDS in Africa held in Durban, South Africa from 3-6 February, 1997. The conference was organised by members of the IUSSP Committee on AIDS: Basia Zaba (Chair) Kofi Awusabo-Asare, Ties Boerma, Michel Carael, Hans Oluf Hansen, Martina Morris and Ancholee Singhanetra-Renard, in collaboration with Eleanor Preston-Whyte and Alan Whiteside from the University of Natal. This publication was made possible by a grant from UNAIDS, and there will be a sister publication of materials pertaining specifically to South Africa, financed by the South African Department of Health.

In addition, a number of organizations contributed financially to the running of the conference - these included Abbott Laboratories, African Life Assurance, Afrox, AIDSCAP (South Africa), Anglo American and De Beers Chairman's Fund Educational Trust, Argus South Africa Community Projects, Arrow Africa, Bayer, Cyanamid, Development Bank of Southern Africa, First National Bank, Highveld Steel, Illovo Sugar Ltd., JCI, Manta Medical, McCarthy Retail Ltd., Metropolitan Life, Nedcor Community Development Fund, Old Mutual, Overseas Development Administration, Sandoz Products, SARA Project, Swiss Reinsurance Southern Africa, UNAIDS, UNFPA, USAID and Warner Lambert.

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