



Policy and Research Paper N°14

Data and Decision-making

Demography's Contribution to Understanding AIDS in Africa

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Introduction

Policy & Research Papers are primarily directed to policy makers at all levels. They should also be of interest to the educated public and to the academic community. The policy monographs give, in simple non-technical language, a synthetic overview of the main policy implications identified by the Committees and Working Groups. The contents are therefore strictly based on the papers and discussions of these seminars. For ease of reading no specific references to individual papers is given in the text. However the programme of the seminar and a listing of all the papers presented is given at the end of the monograph.

This policy monograph is based on the seminar on 'Socio-demographic Impact of AIDS in Africa' organised by the IUSSP Scientific Committee on AIDS, in collaboration with the University of Natal, Durban, held in Durban, South Africa, from 3-6 February 1997.

Background

The challenges posed by HIV are relatively new to demographers and policy planners alike. In February 1997, the International Union for the Scientific Study of Population and the University of Natal brought both groups together to discuss what they might contribute, individually and by working together, to the fight against the spread of HIV and AIDS. Demographers, epidemiologists and social scientists gathered at the conference entitled 'The Socio-demographic Impact of AIDS in Africa' presented new information on the effect the spread of the virus has on births, deaths and the structure of society. Policy makers, programme managers and private sector planners discussed their planning and information needs and the constraints under which they work. The presentations and debates over four days resulted in a good deal of information of interest to all those who study HIV, plan for the social and economic changes it will bring and work to change the course of the epidemic.

Discussions ranged from the use and usefulness of demographic modelling to issues of funding and communication. This paper summarizes the most important information presented by the speakers and the most interesting points raised in comments from the floor. The intention is to highlight how policy makers and planners might use information about the HIV epidemic contributed by demography and its associated sciences, and suggest ways that contribution might be improved. This review then focuses on findings in three areas - fertility, mortality and orphanhood - presented at the conference. A selection of the papers presented at the conference - all of which are listed at the end of the document - are published in a special issue of Health Transition Review (Supplement 2 to volume 7 - 1997).

The contribution of demography to planning for HIV

By looking at trends in birth, death and migration, population scientists have always been able to help policy-makers, employers and other forward-thinkers to plan for the future, anticipating shifting demands for services, for housing and for jobs. Demographers do this by projecting populations to give some idea of how many people there will be in any given age-group or geographic area, and how these people are grouped into households and families. The relatively new phenomenon of HIV, which has begun to alter population structures in some areas of Sub-Saharan Africa quite dramatically in just 15 years, has highlighted the emergence of a culture clash between demographers and epidemiologists on the one hand and policy-makers and service-providers on the other.

'Data-free decision making...'

In the best of all possible worlds, planners would build their interventions around solid information on everything from HIV incidence in different sub-sections of the population to the economic limits of family coping mechanisms.

Demographers and other specialists would provide them with models whose inputs are derived from carefully-planned and executed longitudinal studies.

But we do not live in the best of all possible worlds. As far as HIV is concerned, policy-makers do not have the luxury of hindsight; they are taking steps to mitigate an unfolding situation of which we have no previous experience. Service providers are trying to anticipate the needs for school books, hospital beds and health insurance. Employers want to anticipate the structure of the workforce, planning for training to avoid critical shortages of skilled staff. They will use whatever data are available. In many cases that means making guesses when faced with an information vacuum, in others it means working with nothing more than projections whose inputs are someone else's guesswork, often not fully described.

To these planners, partial or imperfect data are probably better than no data at all. And yet often data that could help guide their decisions are withheld from these users, awaiting publication in peer reviewed journals, or sit forgotten in the filing cabinets of market research or insurance companies. More often still data are presented in a way that is incomprehensible or irrelevant to people who are not specialists in the demographic sciences.

...vs. 'no data, no decision-making'

It is not always safe to assume that, faced with a critical and rapidly-developing problem such as HIV, decisions will be taken with data or without data. Politicians, religious leaders and others who are reluctant to recognise that a sexually transmitted disease can be a real problem in their country or community may use a lack of data as an excuse for taking no action at all. In making available even preliminary results of work in progress, demographers and researchers can provide those pressing for action with a platform, and so play an important role in catalysing response to the epidemic.

Decision-makers need clear, useable information as rapidly as possible, even if not every statistical significance test has been performed. It may not be definitive, but it is almost certainly better than nothing. There must, however, be an understanding on the policy side of the risks inherent in using provisional data, as well as the publication constraints under which academics labour.

Projections

The HIV epidemic has not run its course anywhere in the world, so we have no real idea of how it might evolve. That does not excuse policy-makers from attempting to make plans or demographers from attempting to inform those plans with estimates, using the best tools and data available. Fifteen years into the epidemic, do we have enough information to build perfect models and make flawless projections? No. Do we have enough to give decision makers an idea of the order of magnitude of the problems they should be thinking about? Probably yes. If demographers have one advantage in this field it is that they have long been accustomed to dealing with pretty unreliable data, and have found sophisticated ways of plugging some of the most troublesome gaps.

Projections are very important in helping planners understand the structural implications of HIV, and how it is likely to affect population structure and dependency ratios in years to come. Rather than agonise over the imperfections in projections, policy makers should focus on general trends and structural changes, recognising that actions and interventions are likely to be similar regardless of the absolute numbers involved - it is often the relative impact on various groups that will guide decision making, and good projections will certainly illustrate those differentials.

Planners should note that projections are frequently designed to answer 'what if...?' questions, illustrating what effect a certain fall in fertility or rise in condom use might have on the population structure and the course of the epidemic, for instance. This is NOT the same as a prediction or forecast, which posits that the situation is likely to arise. If planners feel that predictions are more useful than projections, they need to sit down with demographers and work on inputs. They need to agree, for instance, on what level of behaviour change might be achievable in a given society, or what trends in fertility are likely to be. To do this effectively, policy makers will need to consider what level of funding and effort they are prepared to put into such interventions as behaviour change initiatives, re-organized family planning programmes and information campaigns. They will also need to examine the extent to which such interventions have been successful in other populations in the recent past. A failure to be honest about political will and funding, and to reflect that honesty in the inputs of models, will necessarily yield forecasts that are out of step with reality and therefore unhelpful.

Forecasts for the next decade or so (those of most immediate interest to people trying to cope with the epidemic right now) are most likely to reflect reality because the bulk of the HIV-related deaths in that period will be of people already infected at the time of the forecast. Projections beyond that point will depend fundamentally on changes in sexual behaviour, which are near-impossible for a demographer to predict.

Projections as a force for change

Most planners want projections so that they can see what services they will have to provide, and for which sections of the population. But projections can be a powerful visual tool for demonstrating the benefits of prevention efforts. If, by introducing preventative programmes in your workforce, you could cut infections by ten percent, here is how much you might save on medical costs... If, by improving the image and distribution of condoms, you could increase their use with non-regular partners to 60 percent, this is what we might see in terms of reduction in the number of orphans in this community....

Projections can be a very useful tool in helping policy-makers distribute resources and prioritise their programming. They are also useful in demonstrating graphically the cost of NOT taking any action. But policy-makers must understand that projections are only as good as the information that goes in to them. The more effort planners put into working with demographers to identify realistic inputs, the more useful the results are likely to be.

Gaps in our toolbox

Defining and measuring the inputs for projections is no easy task. In the case of HIV it is greatly complicated by the nature of the infection, which passes back and forth between the sexes. Since most projections continue to be based on a single-sex model of fertility (usually female) they are unlikely to capture the complex effects of a sexually transmitted disease. We need to work on methods for modelling sexual activity which reconcile male and female perspectives on partnership formation, and are thereby capable of reconstructing the distribution of risk of infection across the population.

Such methods are likely to need inputs of a qualitative nature, and should help break down the somewhat artificial barriers between different branches of population science such as demography, anthropology and economics. In broadening their approach, demographers, policy makers and private sector planners could do much to avoid reinventing the wheel by making better use of sources of data other than traditional census reports, survey analyses and journal publications. Utility companies may have collected data on household structures or made forecasts of urbanisation, for instance, while human rights groups may have published work on high-risk sexual practices such as child prostitution or domestic violence.

In attempting to understand and anticipate the impact of the HIV epidemic, different people have different needs - some are interested in the spread of the infection in specific groups, such as sex workers, or specific areas, such as the province covered by the NGO they work for. Others are interested in global and national level estimates. Data gathered on specific groups are not easily turned into global estimates. Yet the practicalities of data collection often limit the sources available. For example, estimates of HIV prevalence are often made on the basis of anonymous testing of women attending ante-natal clinics. But these estimates exclude men entirely and are unlikely to be representative even of the general female population, as the section on fertility illustrates. Monitoring prevalence in ante-natal clinics is essential for looking at general trends, especially where we have reason to believe that biases have not changed over time. But much more must be done to understand the relationship between commonly tested groups such as antenatal clinic attenders and the population we would like to target with interventions.

In any case, prevalence data in isolation are not enough. Planners want to know not just how many are dying, but who is dying. One study presented showed that a higher proportion of household heads were HIV positive than of people in the general population, and that the proportion rose in the better-off households. The death of a household head is likely to have wider social and economic impacts than the death of an infant; one rural study showed that households that lose their principal breadwinner to AIDS appear to become worse off, often selling important durables such as bicycles at a time when non-HIV infected households appear to be increasing their wealth. If policy-makers and service provider know who is dying, they can plan for the increased vulnerability of related groups that may be caused by a single death.

Migration

Perhaps the greatest gap in our tool box in the Sub-Saharan African context is a set of methodologies for looking at migration. Migration may well be both a cause and an effect of the spread of HIV, and it certainly introduces bias into studies of the disease. Household analysis is particularly bad at picking up floating migrants who may be the key to HIV transmission at some stages of the epidemic.

Labour-related migration is the norm in many areas, and is likely to be associated with changes in risk behaviour. And urbanisation may be radically altering the whole social landscape in some countries, eroding the strength of the extended family and with it the means to cope with the shock of high adult mortality. The few longitudinal studies that exist in rural areas recognise that migration may seriously distort results, but have not found ways of

following migrants. Longitudinal studies in urban areas have not even been attempted, precisely because loss to follow-up would be so great.

Policy-makers and population scientists needs to broaden their sights in dealing with HIV. They need to work together with one another and with groups not traditionally associated with their disciplines. There is an urgent need to experiment with new ways of looking at issues such as sex and migration that are currently piling up in the 'too hard for now' basket. The support of governments and local communities can be essential in making a success of new data-collection strategies.

Speaking the same language

Those involved in understanding and dealing with HIV and its consequences need to talk to one another, and they need to talk the same language. For researchers, that may mean giving more thought to the political constraints faced by politicians and other actors in the field of HIV. There are many reasons why politicians may not act to pre-empt the spread of HIV. One of them may be a lack of information or understanding - here population scientists may make a contribution in prompting action. But there are many other reasons for inaction, ranging from personal denial to preoccupation with drought or rebel movements to strong opposition from an important religious lobby. In Sub-Saharan Africa as in the rest of the world, technocrats and planners who see the need for action may need to express it in terms politicians most easily understand. Votes and money are two key considerations, but there are others. The same holds true for the private sector - getting action out of the boardroom may only be possible if one speaks with the voice of the shareholder or the finance director.

Perhaps the easiest way to ensure that politicians and other decision-makers incorporate the recommendations arising from research and projection into their planning is to make sure they play a role in planning the research itself. The more input they have in specifying the goals of research, the more likely it is that research will meet their needs and be useable.

Selling the need for action is like selling anything else - the substance is important but the presentation can make or break the sale. Researchers may need to speak the language of politicians if their results are to inform action. And decision-makers must be clear about how they intend to use information that researchers collect. Both planners and researchers have every interest in working together to identify research and information needs.

Understanding fertility

The importance of fertility

Fertility is crucial to social planning because even small changes in fertility can have a substantial impact on the age structure of the population. A downward trend in fertility, coupled with high HIV-related mortality, may result in shrinking populations with old age structures in some areas.

Fertility change can increase the relative size of vulnerable groups, too. Fewer births per woman will initially translate into higher proportions of orphans, for instance. A sharp drop in fertility undercuts the age pyramid, which means higher proportions of children in older age-groups, but older children are more likely to have mothers who have died than those born more recently.

The relationship between fertility and HIV is also important to our understanding of the epidemic because much of what we know about levels of infection comes from the anonymous testing of pregnant women. Strong associations between HIV infection and fertility, either physiologically or behaviourally, clearly have the ability to distort the extent to which we can relate such data to the general population.

Fertility and behaviour change

Unprotected penetrative sex can result both in pregnancy and in the transmission of STDs including HIV. Behaviour change in response to HIV can therefore reasonably be expected to have an impact on fertility as well as on the incidence of HIV and other STDs.

Behaviour change can work in both directions. Some responses tend to undermine fertility. These would include more use of barrier protection and the deliberate avoidance of pregnancy by those who think they may be HIV infected - and know that an infected mother can pass HIV on to her baby. And where HIV-related mortality is high, women may spend less time in relationships that expose them to pregnancy risks because their partners may die prematurely.

Other responses might actually promote births. If a woman believes that long periods of abstinence after a birth have traditionally encouraged men to seek other partners, she may resume relations with her husband earlier than normal to discourage his involvement with casual partners. And if she knows that a child may be infected through breast milk, she may reduce breastfeeding times and therefore lose out on the natural contraceptive effects of the practice. In some areas, infertility has often been associated with high levels of untreated STDs, which are now also known to increase HIV transmission risks. Programmes which aim to cut HIV incidence by identifying and treating STDs may therefore have the secondary effect of cutting down infertility and promoting births.

The net effect of these various fertility responses depends to an extent on whether abstinence and breastfeeding are still important forms of birth spacing or whether they have been overtaken by modern contraceptives. It is important to note that sero-status is rarely known - it is the perception of risk rather than actual infection which drives behaviour. At a national level fertility may well be determined more by behaviour change among the majority of the population than by the response of those infected by HIV. Indeed the very fact that someone is sero-negative may indicate that they are practising lower-risk sexual behaviours which may also affect their childbearing.

Fertility is an issue firmly rooted in culture, and high mortality has for centuries propped up high fertility. The psychological impact of HIV on women considering childbearing is far from clear. But being surrounded by death, even if it is not infant death, has not traditionally been a powerful motivator for family limitation. In many cultures, children represent a woman's best claim on family resources, especially where adult male mortality is high. Programme planners must not forget when planning HIV interventions that many women would rather run the risk of infection than run the risk of childlessness.

Reduced fertility in HIV positive women

Physiological interactions between HIV infection and fertility could alter how we interpret data from sentinel surveillance systems, which to date have relied heavily on testing of antenatal clinic attenders. If HIV-positive women are less likely to become pregnant, then prevalence among pregnant women would tend to underestimate prevalence in the population of all women of childbearing age. If infecundity is related to length of infection, then the bias will change over time as the epidemic matures and women infected in the early years increasingly drop out of the surveillance figures, so even prevalence trends over time would be misleading.

Several community-based studies were discussed at the conference, in which attempts had been made to measure the magnitude of the impact of HIV on fertility. The results of these studies differed in magnitude but shared a clear direction. Fertility in HIV positive women was lower than among the sero-negative in every age group, with the exception of teenagers. And while birth rates to women who tested negative for HIV peaked among those aged between 20 and 24, among those who tested positive the rates declined linearly from the youngest age group. In one rural population study, fertility was 20 percent lower among the HIV positive than the HIV negative, after adjusting for age and marital status.

This lower fertility could be related to other STDs or to behavioural responses in those who know or feel they might be HIV-infected. One rural population-based study in Uganda was designed specifically to determine what other factors might account for the lower fertility among HIV infected women. This study found that those infected with HIV behave differently from the HIV negative - they were more likely to report multiple partners but less likely to have had sex in the last month. But these and other factors such as education, contraceptive use and other STDs cannot explain why pregnancy among HIV infected women is half as high as among those not infected. Women reporting a symptom commonly associated with AIDS were over 70 percent less likely to be pregnant. This may indicate that women in the advanced stages of HIV infection are less likely to conceive, or that they are more likely to suffer early miscarriages. Active syphilis was found to reduce the likelihood of pregnancy by around 30 percent independently of HIV, particularly in the youngest age groups, but other STDs appeared to have little effect.

Women infected with HIV appear to be significantly less likely to conceive and bear children than HIV negative women, regardless of behavioural differences. The relative infertility appears to increase as HIV infection progresses to AIDS. This may imply that prevalence data derived from antenatal clinic attenders underestimate infection among women of childbearing age in the general population, especially in older cohorts. Changes in sentinel surveillance systems may be needed to improve tracking of HIV infection. Behaviour change in response to HIV may affect fertility in either direction, depending largely on underlying patterns of contraception, breastfeeding and traditional abstinence. Broadly, the more traditional the child spacing mechanisms in a society, the more likely it is that behavioural responses to HIV increase fertility. Where levels of modern contraceptive use and knowledge of HIV transmission routes are high, behaviour change is more likely to reduce fertility.

Mortality

The epidemiologic transition

In the early stages of economic development, mortality tends to be dominated by the death of young children. As countries grow richer, public health measures and other development efforts erode the importance of childhood infections and other communicable diseases. People live longer, and the degenerative diseases of older age begin to take over as leading causes of death.

Although adult mortality is notoriously hard to measure in developing countries, it is clear that this transition is underway in parts of Sub-Saharan Africa. AIDS threatens to turn the clock back.

Studies following the general population over time, often begun in the wake of the AIDS epidemic, allow us to learn more about all causes of adult death and are beginning to show the magnitude of the threat. Life expectancy is falling dramatically because of death associated with HIV. The erosion of communicable disease as an important cause of death is being delayed.

Longitudinal studies show that adults infected with HIV are between 13 and 17 times more likely to die in a given time period than those who are free of the virus. In a population where fewer than 1 in 10 are HIV positive, 4 deaths in ten can be attributed to HIV. In the age-groups most affected - between 25 and 44 for men and 20 and 24 for women - 7 out of ten deaths may be HIV related. A Ugandan study of rural areas and trading centres calculated that 82 percent of deaths of economically active adults were associated with the virus. In trading centres with a young population structure and close to a third of all adults infected with HIV, nearly nine adult deaths in 10 are HIV-related.

Causes of death

In planning spending on health and other development priorities, governments need to know as much as possible about the impact on the population of various causes of death and disability. Studies comparing HIV with other causes of death calculate that the virus is now the leading cause of death among adults even in rural areas where overall HIV prevalence among adults between 15 and 44 is around seven percent. Even at such relatively low prevalence, over a third of all adult deaths were classified as HIV/AIDS related, and these accounted for over half of all deaths from communicable and reproductive causes. The next most prominent killer, diarrhoea, trailed far behind, causing just over six percent of deaths.

Interaction between HIV and other diseases

Because HIV does not kill directly, but rather leaves the body vulnerable to other infections, health planners have become increasingly interested in the interaction between HIV and other diseases. There are suggestions, for instance, that people suffering from malaria may be at higher risk of HIV infection. This could have important implications for policy-makers deciding how to spend scarce resources. Looking at current cause of death data, they may be tempted to take money out of malaria control and switch it to HIV prevention. And yet if those who have malaria are more susceptible to HIV, controlling malaria may be a way of controlling HIV.

Other diseases such as TB interact with HIV in important but little-understood ways. The proportion of TB associated with HIV rises dramatically with HIV prevalence. One case control study showed that when under three percent of the adult population was infected with HIV, some 17 percent of TB was associated with the virus. As HIV prevalence rose towards 11 percent, nearly four TB cases in 10 were related to the virus. But the impact of HIV on TB is greater still, since a rise in the number of TB 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.

Although TB has traditionally been a disease of the poor and less educated, the disease profile is beginning to change because of its strong association with HIV. In populations where HIV is most common in the wealthy and better-educated, TB is increasingly becoming a disease of the rich. This may mean that service delivery patterns need to be rethought.

Life expectancy

HIV disease is having a dramatic impact on life expectancy, the summary figure most frequently used by policy-makers in looking at health status. In a population where the proportion of adults infected has remained stable at eight percent for several years, it can cut life expectancy at birth by around 16 years, with most of the effect felt in the adult years.

In discussing life expectancy, we should be clear that a reversion to life expectancy figures last seen decades ago does not imply a return to those mortality patterns. Where increasing mortality is caused by HIV, the burden of death will shift from the under-fives to young adults. Planners need to be a little wary of assuming that, in the absence of HIV, life expectancy would be the same as that seen in the HIV negative populations studied, which is sometimes surprisingly low. It may well be that people most likely to be infected by HIV generally lead high-risk lifestyles, and so would have higher mortality than the residual HIV negative population even in the absence of the epidemic.

Of course HIV infection will have different impacts on life expectancy at different levels of prevalence and at different stages of the epidemic. Early indications are that people in Sub-Saharan Africa live with HIV for around seven years before developing AIDS, although they are likely to survive for less than a year after that. Where new infections outnumber HIV-related deaths, it is to be expected that the epidemic is still in a growth phase, and that the full mortality impact may be some years off.

HIV appears to have a dramatic impact on adult mortality. Even at low prevalence levels it can increase adult mortality by a third, and in the young and mobile it can account for 9 adult deaths in ten. The virus is making inroads into recent hard-won gains in life expectancy, reducing it in some areas by up to 16 years.

HIV can affect the importance of other public health problems, both because resources are diverted and because people with immune systems broken down by HIV provide easy hosts for opportunistic infections such as TB that can also have an important impact on the general population. Planners need to know more about these interactions.

A note on measuring mortality

The AIDS epidemic has given new impetus to the search for ways to measure adult mortality in developing countries. The difficulties in the field are well known, and include age mis-reporting, high rates of migration and fluid household structures. Demographers developed many ingenious methods for tackling these problems - foremost amongst these methods being the collection of data on the survival of relatives in household surveys and censuses - the so-called 'indirect estimation techniques'. The advent of HIV does not make things any easier - stigmatisation, the dissolution and re-formation of households and the likelihood that the disease will kill several or all members of a single household further complicate traditional methods of data collection. But policy-makers continue to demand estimates, and resources for data collection are not growing. Is it possible, then, to use the traditional indirect methods of demography for estimating mortality from questions asked at a single round survey? The answer appears to be yes, as long as adjustments are made for the effects of HIV transmission. Asking survey respondents whether their mother or father is alive can still yield useful results if relatively simple adjustments are made to take into account the fact HIV is disproportionately likely to affect the children of HIV positive parents. The method is not perfect, but comparison with deaths recorded in longitudinal studies shows that it produces results within five or 10 percent of true levels of mortality, and for a fraction of the cost of longitudinal follow-up surveys. Where HIV is cutting adult survival by two fifths, estimates from orphanhood questions included in household surveys are likely to be a cost-effective way of monitoring trends in adult mortality.

Lifetime risk

Mathematical calculation can also tell us something about the likelihood of dying from HIV-related causes rather than other causes at a given level of prevalence. Prevalence figures can be misleading because the denominator is frequently the entire population over age 15. That will include many people who are at the start of their sexual lifetimes and may well go on to become infected in the years to come. At the other end of the age spectrum, it includes only survivors - the people who did not become infected during their years of sexual activity. Those in the same age group who did become infected are likely to have died and do not figure in the prevalence estimate. So in fact the risk of dying from HIV-related causes over the course of a lifetime can be very much higher than the prevalence figures suggest at first glance. Calculations show that a prevalence of under 10 percent can translate into a lifetime risk of dying of AIDS of around 30 percent. However the models from which such estimates can be constructed, are based on stable populations with constant fertility, non-AIDS mortality, age structure and HIV prevalence. Although such stability is unlikely in a population affected by HIV which itself acts on several of these parameters, the general finding that lifetime risk is substantially greater than prevalence will be valid for most real populations. In populations in which the epidemic is still growing the relationship between HIV prevalence and lifetime risk of AIDS death will vary between different age cohorts, with younger cohorts experiencing the most extreme risks. Because it represents the overall HIV risk faced by an individual, the lifetime risk measure may be useful for advocacy purposes.

Just as there is a link between prevalence and lifetime risk of death, so there is a link between prevalence and perception of risk. A study in several rural districts of Uganda showed that where a fifth of all adults are HIV infected, nearly a third have at least one resident who is HIV positive. So more people have a direct experience of infection, illness and death in the household than straight prevalence figures would at first suggest. The observation is important because people's behaviour is often shaped by experience in the home.

Orphanhood

Policy makers and other service providers may have a special interest in planning for the needs of those people who have no way of helping themselves. Since HIV infects people who are young and sexually active, it is more likely than most fatal diseases to affect parents and to leave behind orphans. The extent to which orphans need special care will vary depending on cultural and social coping mechanisms as well as the level of orphanhood.

How many orphans?

Levels of orphanhood depend on several factors, including the stage of the epidemic, adult mortality and the interaction between HIV and fertility. Cohort studies in rural populations with levels of prevalence of around 10% calculate that between seven and 15 percent of children have lost at least one parent.

Because HIV causes premature adult deaths and lowers the fertility of those who are infected, those who die of HIV-related causes are likely to have borne fewer children and therefore leave fewer orphans than other adults who die in their reproductive ages. Mothers who transmit HIV to their offspring will not increase the orphan pool much, since babies infected at birth do not generally survive long. In one study, orphans under the age of five were six times as likely to be HIV infected as children with both parents alive. Few of those infected children will make it to school age.

In South Africa, where health services are more developed than elsewhere in Sub-Saharan Africa, the increasing use of the drug AZT during pregnancy may reduce vertical transmission and so increase orphanhood.

Coping with AIDS orphans...

HIV and AIDS are increasing adult mortality and so orphanhood in many African nations. But it is worth bearing in mind that in much of the continent, social and cultural institutions were formed against a backdrop of very high mortality. Extended families are the norm and child fostering, by relatives and others, is common.

One study in rural Tanzania found 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. And a significant proportion of orphans were living away from their parents before they became orphaned. Some forty percent of children who had lost one parent were not living with the surviving parent, especially if it was the mother who had died.

Grandparents very frequently cared for both foster children and orphans, and rarely had any significant outside support for their charges. Orphans were very often found in households headed by women.

It has frequently been assumed that orphans and foster children get less care than biological children, but the Tanzanian study found no evidence of this, at least not among pre-teen children. By their teens, children not living with their biological parents are more likely to drop out of school. However, this longitudinal study found little evidence that orphans were more likely to die than non-orphans once age and HIV status are taken into account.

...and failing to cope

These indications are encouraging, but it is worth noting that orphans are very mobile, and that the most mobile (and therefore the hardest to follow up in a study) may also be the ones who are most vulnerable. While it seems that traditional coping mechanisms are rather robust in rural areas, relatively little is known about fostering patterns in urban areas, which are the worst affected by HIV. It should also be borne in mind that we are unlikely to capture information on the households that cope poorly - those whose children become street children or whose mothers become itinerant sex workers, for instance.

Long-established systems of care and fostering centred on the extended family are able to absorb a certain amount of the shock of the increase in orphanhood due to HIV, a virus which has claimed the lives of the parents of over 40 percent of orphans in some rural populations. But falling fertility, urbanisation and the migration of labour, often across borders, may be eroding the extended family structures that provide the cushion.

All coping mechanisms have a limit, and the appearance of child-headed households in Zimbabwe suggests that in some areas those limits are already being reached. The situation will get far worse as HIV decimates the pool

of care takers and we start to see the orphaned children of the current generation of orphans, who will have no grandparents to care for them. Left to care for themselves, they would be unlikely to complete their schooling. Unless society can support them in a constructive way, they may resort to theft, gang membership and sex work to survive.

Community-based support for the ways in which families have always taken care of their own will become increasingly important, but we have to plan too for the needs of the dislocated orphans of migrant workers, for instance, and for a time when there are more children in need of care than there are adult households willing or able to care for them. Children are not able effectively to lobby on their own behalf - adults in government and the community must take the lead.

Conclusion

Research presented at the conference confirms that HIV is pushing up mortality quite dramatically and seems to be pulling down fertility. It may soon swell the number of orphans beyond families' abilities to absorb them. The better we understand the social, economic and physical causes and effects of these changes, the better we can plan for them and, where necessary, attempt to alter their course. More understanding and more coherent action will follow when all those involved in tracking, projecting, and planning to minimise the epidemic cross the trenches and fight the battle against HIV from the same side.

Socio-demographic Impact of AIDS in Africa

List of the papers presented at the seminar on 'Socio-demographic Impact of AIDS in Africa' organised by the IUSSP Scientific Committee on AIDS, in collaboration with the University of Natal, Durban, held in Durban, South Africa, from 3-6 February 1997.

Session 1: Fertility

- 'HIV-1 and fertility change in rural Zimbabwe' by S. Gregson, T. Zhuwau, R.M. Anderson and S.K. Chandiwana
- 'Estimates of the impact of HIV-1 infection on fertility in a rural Ugandan population cohort' by L.M. Carpenter, J.S. Nakiyingi, A. Ruberantwari, S. Malamba, A. Kamali and J.A.G. Whitworth
- 'Reduced fertility in women with HIV infection: a population-based study in Uganda' by R.H. Gray, D. Serwadda et al.

Session 2: Household and Family Structure

- 'Household composition and the HIV-1 epidemic in a rural Ugandan population' by S.S. Malamba, J.S. Nakiyingi, A. Kamali, L.M. Carpenter, A.J. Nunn and J.A.G. Whitworth
- 'HIV infection in rural households, Rakai district, Uganda' by M.J. Wawer, J.K. Konde-Lule, F. Nalugoda, R.H. Gray and R. Menon
- 'Widowhood, remarriage and migration during the HIV/AIDS epidemic in Uganda' by J.P.M. Ntozi

Session 3: Mortality

- 'Five-year HIV-1 associated mortality in a rural Ugandan population' by A.J. Nunn, D.W. Mulder, A. Ruberantwari, J.F. Kengeya-Kayondo, A. Kamali and J.A.G. Whitworth
- 'Levels and causes of adult mortality in rural Tanzania with special reference to HIV/AIDS' by T.J. Boerma, M. Urassa, J. Ng'weshemi, R. Isingo, K.P. Senkoro, R. Gabone, E.N. Mkumbo
- 'Assessing the mortality impact of HIV/AIDS relative to other causes of adult deaths in Sub-Saharan Africa' by J.A. Adetunji
- 'Reconstructing the dynamics of the HIV/AIDS epidemic in Abidjan, Côte d'Ivoire: 1986-1995' by M. Garenne, F. Friedberg and B. Zanou
- 'AIDS epidemic and infant and child mortality in six districts of Uganda' by J.P.M. Ntozi and I.M. Nakanaabi

Session 4: Measurement Issues

- 'Measurement of adult mortality in populations affected by AIDS: an assessment of the orphanhood method' by I.M. Timaeus and A.J. Nunn
- 'HIV prevalence and life-time risk of contracting HIV/AIDS' by J. Blacker and B. Zaba
- 'Data for decision making: a review of HIV/AIDS data in Southern Africa, questioning collection, reliability and interpretation' by M. Manyasha, D. Lindsey, H. Jackson and R. Kerkhoven
- 'Interactions between HIV and tuberculosis in a rural area of Malawi' by J.R. Glynn, D.K. Warndorff, P.E.M. Fine, G.K. Msiska, M.M. Munthali; J.M. Pönnighaus

Session 5: Orphanhood

- 'Children rearing children - a study of child-headed households' by G. Foster and C. Makufa
- 'Using national survey data to estimate mortality rates in the context of the AIDS pandemic in Sub-Saharan Africa' by G. Bicego
- 'Orphanhood, child fostering and the AIDS epidemic in rural Tanzania' by M. Urassa, J. Ng'weshemi, R. Isingo, Y. Kumogola and T.J. Boerma
- 'AIDS and orphans in Uganda: a geographical and gender interpretation of household resources' by H.R. Aspaas
- 'Impact of the HIV-1 epidemic on orphan mortality in a rural Ugandan population cohort' by A. Kampala, J.A.G. Whitworth, A. Ruberantwari and L.M. Carpenter

Session 6: The Implications of the Demographic Impact of HIV/AIDS in Africa - from Theory to Policy and Practice

- 'Projecting the HIV/AIDS epidemic in Southern Africa' by B. Zaba, S. Gregson, G. Garnet and R. Anderson
- 'Towards optimisation of the HIV/AIDS modelling process in South Africa' by P. Doyle, T. Mühr, J. Broomberg and M. Steinberg
- 'Projecting the epidemic: Policy makers and planners needs' by A. Whiteside

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