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THE HIV/AIDS EPIDEMIC AND ITS SOCIAL AND ECONOMIC IMPLICATIONS *

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Since its onset in 1981, when the first AIDS cases were reported, the human immunodeficiency virus (HIV) epidemic has become not only the deadliest epidemic in contemporary history but also a major demographic, humanitarian and development crisis. As of end-2002, 42 million people were infected with the HIV and 22 million had already lost their life to the disease. More than 13 million AIDS orphans are currently living in sub-Saharan Africa. The HIV/AIDS epidemic is leading to a reversal of hard-won gains in life expectancy of the previous decades. Moreover, the HIV/AIDS epidemic has been threatening the social fabric of societies in the most affected countries and eroding the social and economic safety net.

This paper reviews the state of knowledge on the socio-economic impact of AIDS. The first section discusses the demographic impact of the epidemic. Life expectancy at birth is estimated to have dropped by more than 20 years for some countries while a few are expected to experience a decline in their population in the near future. The second section examines the impact of AIDS on households, the first units affected by the epidemic. The third section presents the impact of AIDS on the private sector (firms and companies). The fourth section investigates the impact on the agricultural sector. The fifth and sixth sections give an assessment of the impact of the AIDS epidemic on elements of human capital, that is, health and education. Lastly, the impact on macro-economy is examined before a summary of the lessons learned and the proposition of new avenues of research to further investigate the impact of the HIV/AIDS epidemic.

A. The Demographic Impact of AIDS

The AIDS epidemic is taking and will continue to take a devastating toll on human lives. According to the 2002 Revision of the United Nations World Population Prospects (United Nations, 2003), life expectancy at birth has already fallen by more than 10 years in the most affected countries, those with an adult HIV prevalence of 20 per cent or more. In most of the countries that are severely affected by the epidemic, HIV/AIDS is responsible for stopping or even reversing the long-term decline that had been registered until recently.

The impact on population size is most marked in Africa. In 38 African countries for which the United Nations Population Division explicitly incorporates the impact of AIDS into its *2002 Revision* of the official United Nations world population estimates and projections, the population size is estimated at 603 million in 1995, 16 million less than it would have been in the absence of AIDS. By 2025, the population of these 38 African countries will reach 983 million, 14 per cent fewer than in the absence of AIDS. In the 7 countries with an adult prevalence of 20 per cent or more, all in Africa, the impact is more striking. By 2025, the population of these countries is projected to be 35 per cent lower than it would have been in the absence of AIDS.

Life expectancy at birth, a measure indicating the average number of years that a newborn child would live if mortality remained constant throughout his lifetime, is estimated at 47 years in 1995-2000, 6 years lower than it would have been in the absence of AIDS in the 38 African countries. It is projected to reach only 52 years by 2020-2025, 10 years lower than it would have been in the absence of AIDS. In the seven countries with an adult HIV prevalence of 20 per cent or more, life expectancy at birth is estimated at 49 years in 1995-2000, 13 years lower than in the absence of AIDS. By 2020-2025, the difference between the life expectancy with AIDS and the life expectancy without AIDS will reach 29 years, a 41 per cent difference. Figure I shows the estimated and projected life expectancy at birth for specific countries of this group.

The age-differentiating characteristic of the AIDS epidemic makes its impact especially devastating for the affected populations. Figure II presents the age pyramid of Botswana in 2000 and 2025 with AIDS and in the absence of AIDS. Whereas the impact of AIDS is not apparent on the age structure in 2000, by 2025, a serious deficit is projected in the population of working age, especially those aged 30 to 50 years. As AIDS kills predominantly the younger adults, Botswana and the other worst-affected countries will witness in the future a hollowing out of an entire generation.

B. The Impact of HIV/AIDS on Households

The impact on households and families begins as soon as a member of a household starts suffering from HIV-related diseases. In this regard, three kinds of impacts can be distinguished. The first one is the loss of the income and household production of the family member, in particular if he/she is the breadwinner. The second impact is the increase in household expenditures to cover the medical costs. The third impact is the indirect cost resulting from the absenteeism of members of the family from school or work to take care of the patient. When the person dies, the temporary loss of income becomes a permanent loss; funeral and mourning costs are incurred; and the family may compensate by reducing investments in productive activities (e.g. removing children from school to save on expenses and increase household labour). Households may lose most of their savings in order to pay for the high costs of HIV/AIDS-related health care and funeral expenses. Furthermore, community attitudes towards helping needy households may contribute to the impact of the disease. For example, households in the more urbanized areas may suffer the worst impact because of the lack of community support. In societies where stigmatization of the HIV-affected individuals and households is common, the impact of the HIV/AIDS epidemic may be even more severe.

The change in the composition and structure of households caused by the HIV/AIDS epidemic may be not only quantitative but also qualitative. Thus, the number of impoverished female-headed households will increase when the male breadwinner of the household dies of AIDS. Where the AIDS patient in the household is female, the impact of the HIV/AIDS epidemic on the household can take a form that is different and of even greater magnitude. Indeed, the (often culturally determined) position of women can affect the household impact of an illness such as AIDS in males.

One of the striking features of the economic impact of AIDS on affected households and families in Zambia, for example, is the rapid transition from relative wealth to relative poverty. Haworth's (1991) survey of AIDS-affected families found that the shift into poverty was most visible in families in which the deceased father was both the breadwinner and tenant of a house provided through his job. Many such families were forced to move after the death of the father, with a majority of those families reporting economic difficulties.

In the early 1990s, the International Children's Centre in Paris launched a multi-country field study of the socio-economic evolution of children and families affected by HIV/AIDS in three countries: Burundi, Côte d'Ivoire and Haiti. In each of these countries, about 100 households affected by HIV/AIDS were followed longitudinally for a year. In Côte d'Ivoire, the study showed that marked differences occurred in the economic activities of households, with a steady decline in the number of economically active household members throughout the course of the study (Béchu, 1997). In this study that tracked 107 households with at least one adult AIDS patient, it was found that per capita consumption dropped in households where the AIDS patient either died or moved away. In households in which the AIDS patient remained relatively free of symptoms, per capita consumption remained stable over time.

In a longitudinal study carried out in Kagera, United Republic of Tanzania in 1991-1993, households that experienced an AIDS adult death in the year prior to the first wave of the survey spent, in relative terms, more on funerals and health expenditures than did households which did not experience an adult death (figure III), although households without an adult death had higher total expenditure on all goods and services than those with an AIDS adult death. A more recent study in Zimbabwe showed that heavy expenditures, substantial loss of income and erosion of capital assets associated with terminal illnesses are seriously undermining the economic viability of households (Mushati and others, 2003). In another longitudinal study conducted in the Free State of South Africa, it was found that affected households allocated more of their resources to food, health and rent and less to education and clothing than non-affected households (Booysen, 2003).

Outside of sub-Saharan Africa, the AIDS epidemic is also taking its toll on affected households. In a study carried out in Thailand, Pitayanon and others (1997) compared the direct and indirect costs of an adult HIV-related death with those of an adult death from other causes. The impact of an AIDS-related death on the household was substantial and greater than the impact of a death from other causes (table 1). While the direct costs of an adult non AIDS-related death are slightly higher than those of an AIDS-related adult death, the indirect costs associated with an AIDS-related adult death are on average 30 per cent higher than those of a non-AIDS adult death. This is because AIDS deaths occur mainly at the prime working-age years, resulting in a higher number of years lost than deaths due to other causes. Other socio-economic impacts of a HIV/AIDS-related death included the loss of the family labour production. The production loss in the households was almost 50 per cent leading to about a 47 per loss in the household income.

Orphans are paying a heavy toll from the AIDS epidemic. Until recently, the impact of AIDS on orphans had been studied only peripherally. But, a few studies are now trying to fill the gap. For example, in a recent study, Monasch and Snoad (2003) showed that the death of parents affected orphans' living arrangements and schooling. The study of survey data in 40 sub-Saharan African countries found that orphans were less likely to attend school than non-orphans, especially in countries with lower overall school attendance. These results are confirmed by other studies (Bicego and others, 2003; Case and others, 2003; Suliman, 2003). An earlier study (Ainsworth, 2002) using data collected in 28 countries in sub-Saharan Africa, Latin America and the Caribbean points to considerable diversity in the findings. According to the author the diversity in the findings demonstrates that the extent to which orphans are under-enrolled relative to other children is country specific, at least partly because the correlation between orphanhood and poverty is not consistent across countries. A study in Eastern Zimbabwe found that maternal orphans were more likely to drop out of school than paternal orphans in Eastern Zimbabwe (Nyamukapa and others, 2003). However, the studies that are based on nationally representative sample surveys have found that orphanhood affects girls' and boys' schooling approximately equally (Ainsworth and Filmer, 2002; Case and others, 2003).

Another aspect of the impacts of the disease is the change in the structure and composition of households. In many affected regions in developing countries, more and more older persons are taking care of AIDS orphans. This has implications for the welfare of the children as well as for that of their caregivers. Studies conducted in Zimbabwe (WHO, 2002) and Thailand (Knodel and Im-em, 2002) showed that older caregivers are under serious financial, physical and emotional stress due to their care-giving responsibilities. The AIDS epidemic not only puts more stress on older persons, but it also impoverishes them at the very same time they themselves may need to be taken care of. This is especially true in societies where the younger relatives are responsible for the care of older persons.

The empirical evidence, although sketchy, points to a tremendous impact of AIDS on households. Indeed, households and families bear most of the burden since they are the primary units in which individuals cope with the disease. Few studies have documented how the impact varies according to the characteristics of the household. Moreover, the impact on orphans has only started receiving attention. Similarly, the effects of the AIDS deaths of children have only begun to be studied.

C. The Impact of HIV/AIDS on Firms and the Private Sector

The HIV/AIDS epidemic is imposing serious costs on the private sector in the most affected countries. AIDS deaths may lead directly to a reduction in the number of available workers, since the deaths occur predominantly among workers in their most productive years. As younger, less experienced workers replace experienced workers, worker productivity may be reduced. The impact of AIDS will also depend on the skills of affected workers. If skilled workers who occupy important positions in the firm become sick or die from AIDS, the company may lose its institutional memory—that is, the "know-how" accumulated through many years of experience.

The absence of workers in the company may also have an impact on the morale of the remaining workers, which could lead to declining productivity. HIV-infected workers also are likely to become less productive as infection progresses to AIDS. In Namibia, NamWater, the largest water purification company, announced in 2000 that HIV/AIDS was "crippling" its operations (Angula, 2000). They reported a high staff turnover due to HIV-related deaths, increasing absenteeism and a general loss of productive hours. A study in Kenya (Fox and others, 2003) showed that tea pluckers who died of AIDS-related causes produced a quantity of tea roughly one-third less in their last two years of life than other healthy workers. The AIDS patients who died had also suffered an earning loss of 18 per cent in the last year before their death.

Firms that have a health programme to help workers who become sick may find themselves responsible for substantial medical costs. The insurance scheme of the firm may become more expensive as insurance companies increase the costs of coverage as a response to high HIV prevalence rates in firms. This could impede any savings for investment by the firms. A study on Lonrho companies in Malawi found that deaths-in-service benefits increased by more than 100 per cent between 1991 and 1996 (Ntirunda and Zinda, 1998). The study also found that AIDS-related costs were 1.1 per cent of the total costs and 3.4 per cent of gross profits of these companies in 1992. Another study of five firms in Botswana found that the impact of HIV/AIDS depended on the type of business, the skill level of employees, the type of benefits provided, and the amount of savings (Stover and Bollinger, 1999).

Many businesses will also suffer a shrinking market for their goods when HIV/AIDS epidemic in the community leads to the impoverishment of households which can no longer afford to purchase goods. Businesses that produce "luxury goods" are more likely to experience a decline in the demand of these goods. A South Africa furniture manufacturer (JD Group) projected an 18 per cent reduction in its customer base as a result of HIV/AIDS (Whiteside, 1996).

The impact of HIV/AIDS on firms depends partly on the age structure of the workers in the firm. For example, a study conducted in Zambia in Barclays Bank showed that mortality peaked in the 30-39-year age group. The death rate rose from 0.4 per cent to 2.2 per cent between 1987 and 1991, and the bank paid more than ZK 10 million (US$ 58,140) in the form of ex-gratia payments to the families of employees who died from HIV/AIDS (Smith and Whiteside, 1995). The study also showed that medical expenses and training costs were on the increase whereas man-hours were reduced.

Not only does the absence of infected workers contribute to revenue losses at the firm level, but absence of healthy workers taking care for infected family members or attending funerals of co-workers of family members can also be detrimental for companies. It has been estimated that extension workers in north central Namibia spent at least 10 per cent of their time attending funerals (Engh and others, 2000).

In summary, the available studies of the impact of HIV/AIDS on firms point to an impact of the epidemic on the labour force, costs and productivity of most firms depending on the skills of those who are affected and whether they are replaceable or not. The evidence available also points to a greater impact of the HIV/AIDS epidemic on small firms, those with less than 10 employees. The loss of a few employees in key positions in these firms can lead to their disappearance. It may be noted that many studies are conducted by firms for their own use and are still not in the public domain. Their publication would aid in assessing the economic impacts of the epidemic, and in devising sound public policies in response.

D. The Impact of HIV/AIDS on Agriculture

HIV/AIDS is also having a dramatic impact on the agricultural sector, partly because the great majority of the infected population in the most affected countries lives in rural areas. In many African countries, farming and other rural occupations provide a livelihood for more than 70 per cent of the population. A number of studies have been conducted to assess the impact of HIV/AIDS on agriculture. Most of these studies were conducted under the auspices of FAO. Indeed, of the AIDS impact studies conducted so far, the majority have dealt with the rural world.

A study conducted in Burkina Faso in 1997 found that the HIV/AIDS epidemic had led to shifting work patterns and an overall reduction in food production. Revenues from agricultural production had decreased by 25 to 50 per cent (FAO, 1997).

A study among agricultural workers in the United Republic of Tanzania showed that a woman whose husband was sick was likely to spend 45 per cent less time working than if the husband were healthy. In Kagera, a survey showed that, on average, adults in households that experienced a death spent five hours less in farming during the previous week than those without a death (Mutangadura, 2000).

In Kenya, a study found that the commercial agricultural sector is facing a severe social and economic crisis due to the impact of HIV/AIDS (Rugalema, 1999). The loss of skilled and experienced labour to the epidemic is a serious concern. But it is difficult to quantify the impact of the epidemic in terms of increasing costs.

The impact of HIV/AIDS on agriculture may also depend on the level of prevalence in the country or area. For example, production loss in AIDS-affected households was reflected in a survey conducted in Zimbabwe, a country with an adult HIV prevalence of more than 25 per cent. According to this survey, conducted in 1997 by the Zimbabwe Farmers' Union, agricultural output in communal areas declined by nearly 50 per cent among households affected by AIDS (Kwaramba, 1997). Maize production by smallholder farmers and commercial farms declined by 61 per cent because of illness and deaths from AIDS. These production losses could result from a number of factors including shifting production patterns. But according to the same author, the data did indicate a dramatic switch from cash to subsistence crops up to the time of the study.

The impact of AIDS is expected to increase in the future. FAO has estimated that in the 27 most affected countries in Africa, 7 million agricultural workers died from AIDS between 1985 and 2000 and that 16 million more deaths are likely to occur in the next two decades. In the ten most affected African countries, labour force decreases ranging from 11 to 26 per cent are anticipated (table 2).

In summary, the studies available show that HIV/AIDS is having a detrimental impact on the agricultural sector. Since, in many of the most affected countries, this sector occupies most of the population, this impact will be far-reaching and in the long run threatens the food security of areas or entire countries. However, the future impact will depend partly on the possibility of mechanizing agricultural production and reducing reliance on labour-intensive means of production. It is therefore important to review periodically the impact on this sector.

It is also important to point out that the agriculture sector in the most affected countries is already facing a number of other crises, such as desertification and the neglect of the traditional farming sector by governments. FAO observed that the HIV/AIDS epidemic was intensifying labour bottlenecks in agriculture; increasing malnutrition; and adding to the burden of rural women, especially those who head farm households.

E. The Impact of HIV/AIDS on Health Care Systems

The HIV/AIDS epidemic is posing tremendous challenges to the healthcare systems of the developing countries, especially the most severely affected countries. HIV/AIDS increases the overall health expenditures at the same time it is claiming the lives of doctors and nurses in the developing countries.

The impact of HIV/AIDS on the health sector may operate in many ways. First, there may be an increase in the number of health workers affected with the HIV virus. Indeed, epidemiological surveys from sub-Saharan Africa have shown that HIV/AIDS prevalence has been disproportionately higher among doctors and nurses, as well as teachers (Buve and others, 1994). This loss of health workers will affect the supply of public health services.

Occupational exposure may also affect the supply of health care, as more health workers may contract the disease in the workplace through injuries with HIV-positive patients. The increasing mortality of health professionals in some countries poses a serious threat to the replacement of those who are deceased. Training of new professionals will certainly cost more money, while the accumulated experience of those who die is lost forever.

The morale of health professionals may also be affected. Indeed, staff taking care of HIV-infected patients may suffer greater stress than other health workers. This may lead to greater staff absenteeism and staff refusing to be transferred to high-prevalence regions within countries. A shortage of nurses and doctors has been observed in the high-HIV-prevalence countries. This shortage is particularly pronounced in rural areas.

The AIDS epidemic is also responsible for diverting expenditure towards higher levels of care needed for the AIDS patients. Although anti-retroviral therapy is not readily available in the most affected countries, the treatment of opportunistic infections can be costly. The latest anti-retroviral therapy costs more than US$10,000 per person a year. Although countries are exploring generic drugs that may cost US$300 per person a year, according to the latest estimates (IRC, 2003), this figure is still hardly within reach of many African countries. On average, treating an AIDS patient for one year is about as expensive as educating ten primary school students for one year (World Bank, 1999).

The World Bank estimated that a country with a stable 5 per cent adult HIV-prevalence rate can expect that each year between 0.5 and 1 per cent of its health care providers will die from AIDS. In contrast, a country with 30 per cent prevalence would lose 3-7 per cent of its health workers to the HIV/AIDS epidemic (World Bank, 1999).

A study conducted in Rwanda showed that HIV-positive outpatients visited the hospital 10.9 times on average as opposed to only 0.3 times for the general population. The study also revealed that the increased demand for out-patient services was characterized by a considerable inequality—reflecting differential access and command over income (Nandakumar and others, 2000).

In summary, the studies conducted on the impact of HIV/AIDS on the health sector show that the magnitude of the impact is high. Absenteeism and deaths of health workers pose a serious threat to the health system of the most affected countries. Moreover, because the treatment of AIDS is expensive, few public health sectors in the developing world can afford it with the meagre budget devoted to health. Figure IV shows that the part of the health expenses covered by the public sector is as low as 28 per cent in the United Republic of Tanzania. Thus, rising costs will fall mainly on the private sector and households.

Overall, the studies conducted have shown that the health sector in the most affected countries is stretched beyond its limit with the increasing demand due to the HIV/AIDS epidemic. Coping strategies need to be devised by Governments to avoid the collapse of the health system in these countries.

F. The Impact of HIV/AIDS on Education

Like every other sector of the social and economic life of an AIDS-afflicted country, the education sector has been feeling the impact of the HIV/AIDS epidemic. Indeed, an increasing number of countries in sub-Saharan Africa have been facing a shortage of teachers as the pool of qualified educators is shrinking. Deaths and illnesses have also been affecting the education sector administrators, planning and finance officials. Hence, the HIV/AIDS epidemic is threatening the achievement of the commitment to Education for All made by the international community at the April 2000 World Education Forum in Dakar, Senegal, as well as the Millennium Development Goals for education.

HIV/AIDS affects the education sector through three main routes: the supply of education through the availability of experienced teachers, the demand for education (number of children enrolled in school) and the quality of education.

The absenteeism of teachers from school and ultimately their death affects the supply of education. Teachers who are infected with the HIV virus may try to transfer to another area or, once visibly ill, disappear (Katahoire, 1993). Other teachers may also want to transfer out of heavily affected areas or refuse to be posted to them, thus decreasing the supply of education available in the region.

The deaths of children or parents may affect the demand for schooling, as a smaller number of children will be entering the school system and more children will be dropping out of school to take care of sick parents or siblings after the death of their parents. The number of children entering the school system is expected to diminish if AIDS orphans do not enroll, delay enrolling, or leave school in large numbers.

Equally important is the possible decrease in educational quality as teachers may be absent from school and may not be able to provide the same quality of schooling they were providing before becoming sick.

Many studies have been conducted to estimate and predict the impact of AIDS on education. A number of studies undertaken under the auspices of UNICEF reached the conclusion that because of AIDS, many countries will be facing a shortage of teachers in the near future. For instance, a study conducted in Zambia using a model developed by UNICEF showed that of around 1.7 million primary school students, 56,000 would have lost a teacher to AIDS in 1999. The study also found that the number of teachers' deaths in 1998 was equivalent to the loss of about two thirds of the annual output of newly trained teachers (UNICEF, 2000).

The same UNICEF study estimated that 860,000 children have lost a teacher to AIDS in sub-Saharan Africa (table 3) Among them, children from South Africa, Kenya, Zimbabwe and Nigeria are the most affected. In Malawi, 10 per cent of education personnel in urban areas are estimated to have died of AIDS by 1997, and by 2005, it is projected that this figure will increase to 40 per cent (World Bank, 1998).

HIV/AIDS is also affecting the demand for education. For example, focus group discussions with AIDS-affected households found that these households were unable to meet the costs of children's education as a result of AIDS. Furthermore, an analysis of 49 case studies of families affected by AIDS throughout Zambia found that 56 of 215 children had been forced to leave school (Haworth and others, 1991).

In most countries affected by the HIV/AIDS epidemic, the school-age population is projected to continue to grow in spite of HIV/AIDS. But in a few countries, some projections show that the population aged 15 years old and under in 2010 will be smaller than it was in 2000. For example, recent projections of the United Nations Population Division suggest that some of the countries most severely affected by HIV/AIDS will show a reduction in the school-age population. In Zambia, projections yield a population under age 15 and below at 5.8 million by 2010, 1.4 million less than it would have been in the absence of AIDS (Hunter and Fall, 1998).

Despite the limitations in the availability of reliable data, the currently available evidence points nonetheless to a tremendous impact of the HIV/AIDS epidemic on the demand for education, on the education supply and, to a lesser extent, on the quality of education. Many questions remain unanswered, though. For example, is there any difference in the school attendance of children whose parents have AIDS but are still alive and children who are AIDS orphans? Does the situation of AIDS orphans regarding schooling change over time? What are the mitigating factors?

Follow-up studies need to be conducted to document these changes over time. Because most of the studies conducted so far have used small samples, their results may be hard to generalize. It is therefore important to undertake studies using large samples so as to allow in-depth examination of factors affecting the supply, demand and quality of education.

Although some studies have mentioned that teachers are dying of AIDS at a higher rate than the general population, the evidence on this is weak. More needs to be done to investigate this claim.

G. The Impact of AIDS on the Economy

The impact of the HIV/AIDS epidemic on the economy as a whole is an issue that has been addressed since the beginning of the pandemic. There have been claims that the HIV/AIDS epidemic is responsible for slowing the rate of growth of the gross national product (GNP) of many heavily affected countries and that in some cases, GNP could decrease by more than 1 per cent for every 10 per cent HIV prevalence (Cuddington, 1993, Haacker, 2002). Others claim that HIV/AIDS has had no impact on the macro-economy so far (Bloom and Mahal, 1995). Indeed, it is difficult to estimate the effect of HIV/AIDS on a country's economic growth because so many factors other than the HIV/AIDS pandemic affect the long-term economic growth. The most affected countries in the world are also faced with drought, war and other problems.

There are a number of ways in which the HIV/AIDS epidemic could affect the economy: First, the AIDS epidemic may reduce the labour supply, leading to reduced productivity. This may be particularly true in the labour-intensive sectors where replacement of workers is not easy to achieve. Following are some of the mechanisms in action leading to the impact of HIV/AIDS on economic development.

(i) The AIDS epidemic will reduce the labour supply. The economic impact can vary according to the sector of the economy, the degree to which HIV/AIDS affects hard-to-replace skilled labour, and whether or not there is a substantial pool of "surplus labour".

(ii) Savings of families will be reduced due to the increase of HIV/AIDS-related health expenditures (drugs and hospitalisation), leaving less income to invest in the economy.

(iii) The AIDS epidemic may also divert investment fund from other vital sectors to health expenditures, leading to a slower growth of the gross domestic product (GDP). Foreign private investment may also decline, if potential investors become convinced that the epidemic is seriously undermining the rate of return on investment.

(iv) The HIV/AIDS epidemic may also deepen the poverty of the most affected countries by decreasing the growth rate of per capita income and by selectively impoverishing the individuals and families that are directly affected.

A variety of economic modeling approaches have been employed to estimate the macro-economic effects of the HIV/AIDS epidemic. In most cases the focus is on estimating effects on growth of GDP or GDP per capita. Sometimes effects on intermediate outcomes, such as saving and investment, are also estimated.

In interpreting the estimates of the epidemic's effects on the macro-economy, it should be borne in mind that economic forecasting is not an exact science. "It cannot be said that econometric modelling...has a good track record. Also, it should be readily admitted that we know relatively little about those structural relationships which are important for estimating the impact of HIV on development" (Cohen, 1992). Despite the controversies and uncertainties that surround such estimates, there remains a need for policymakers to try to understand the impacts that HIV/AIDS may have on overall performance of their economies and their budgets.

Results of these estimation and modelling exercise vary, depending on the modelling approach as well as on the national context. Dixon, McDonald and Roberts (2003) reviewed 11 studies that attempted to quantify the effect of HIV/AIDS on GDP per capita in Africa. Some of the studies employed a neoclassical growth model fitted to the data of a particular country, and others used cross-national data and regression analysis. “The consensus from these studies is that the net effect on growth of GDP per capita will be negative and substantial. The more recent studies show greater effects; and the most recent estimates indicate that the pandemic has reduced average national growth rates by 2-4 per cent a year across Africa” (Dixon, McDonald and Roberts, 2002).

How large are these effects in comparison to other factors affecting economic growth? Some analysts note that other factors can produce effects on economic growth that are at least as large as those estimated to result from the spread of HIV/AIDS. For instance, Greener (2002) notes that a reduction in the rate of growth of GDP by between 0.5 and 2.6 percentage points, which encompasses the size of the effect indicated by most studies, "is within the range of variation that could be caused by poor economic management or fiscal policy. This implies that the macroeconomic impacts of HIV/AIDS, in themselves, can be substantially reduced by appropriate policy interventions" (Greener, 2002).

However, the longer-term effects on the economy may be more serious than most macro-economic estimates suggest. Estimates of AIDS’ effects on macro-economic performance usually take no account of the loss of “social capital” or of the long-term damage that is accruing to human capital, as children’s education, nutrition and health suffers directly and indirectly as a consequence of HIV/AIDS. The effects of lowered investment in the human capital of the younger generation will affect economic performance over future decades, well beyond the timeframe of most economic analyses (MacPherson, 2003; Bell, Devarajan and Gersbach, 2003).

While many of the studies discussed here deal with quantifiable economic effects of the HIV/AIDS epidemic, the concept of “development” implies more than material advancement. A nation’s achievement of a long and healthy life for its population is itself one of the main defining features of successful development, as is highlighted, for example, by UNDP’s Human Development Index (HDI), which is a combined measure of mortality, education and per capita income. Cohen (1997) and Gaigbe-Togbe (2001) show that HIV/AIDS affects the HDI through its impact on life expectancy at birth. Based on empirical evidence of societies' economic valuation of a death, the epidemic's effect on mortality itself represents a loss of welfare that dwarfs the estimated effects of HIV/AIDS on GDP (Jamison, Sachs and Wang, 2001; Crafts and Haacker, 2003).

H. CONCLUSIONS

Households are the first units affected by the HIV/AIDS epidemic. The death of a breadwinner may lead to the impoverishment of the household. Children are being taken out of school to care for ill parents or for financial reasons whereas grandparents are acting as surrogate parents to care for their grandchildren.

HIV/AIDS is also having a sizeable impact on the labour force, costs and productivity of business firms in the areas with high HIV prevalence. The impact of HIV/AIDS on agriculture is also considerable in the most affected countries. Indeed, the impact in this sector will be far-reaching and threatens the future food security of areas or entire countries.

The health sector is often heavily impacted by HIV/AIDS. The increase in the number of persons seeking medical services and the higher costs of health care for AIDS patients are crippling the already inadequate health systems of the most affected countries in the developing regions. The sector is also losing its personnel to the disease, caring for AIDS patients is stressful for the medical staff. In the education sector, the pool of qualified teachers is also shrinking in countries or areas with high HIV prevalence.

Overall the impact of HIV/AIDS on the economy and development is likely to intensify in the near future. So far, the studies on the impact on macro-economy points to at least to a difficulty in estimating the real impact of AIDS on the economy. Some studies found that the impact of HIV/AIDS on the growth of GDP was marginal, although most found that there would be a substantial negative effect on the economies of countries where HIV prevalence is high. Other studies point out the shortcomings of GDP for assessing impact of HIV/AIDS on economic welfare and development.

Most of the available studies on the impact of AIDS on the economy covered the southern part of Africa. Few studies are available on West Africa or on Asia. This may be explained by the relatively low prevalence of HIV/AIDS in these regions. Thus, the organization of studies in these regions should provide insight on the ways in which the HIV/AIDS epidemic affects development under diverse socio-economic and cultural conditions.

Equally important are the long incubation period of the disease and the different waves of the epidemic, from HIV infection to AIDS mortality. Many countries are still experiencing a rapidly rising prevalence of the HIV and the effects will play out over many years. This makes it difficult to observe empirically and at a global level the magnitude of the impact of AIDS on the economy.

In the most affected countries, the HIV/AIDS epidemic exacerbates existing problems and dysfunctions of the socio-economic system of a region or a country. These countries are already faced with many obstacles on their road to development, including famine, war and inefficient governance and illiteracy to name a few. Poverty, illiteracy and other health programs are also demanding attention whilst the HIV/AIDS epidemic is causing unforeseen ravages. Mitigating policies and programmes need to be devised and implemented in order to ease the suffering of entire population and future generations. Only prevention, treatment and increased support will allow the countries affected and the international community to reverse or at least reduce the dire predictions of the implications of the HIV/AIDS epidemic.

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TABLE 1. DIRECT AND INDIRECT COSTS OF AN ADULT HIV/AIDS-RELATED DEATH AND AN ADULT DEATH FROM OTHER CAUSES (US DOLLARS), THAILAND

Costs	*HIV/AIDS-related death*	*Non HIV/AIDS-related death*
Direct costs		
Medical treatment	973	883
Travel expenses	63	53
Funeral expenses	1 537	1 874
Total direct costs	2 574	2 810
Indirect costs		
Income loss of care provider	102	78
Income loss of the deceased (regular job per annum)	1 880	1 768
Income loss of the deceased (regular job + supplementary job per annum)	2 902	2 234
Lifetime income foregone by deceased (regular job)[a]	28 592	22 020
Lifetime income foregone by deceased (regular + supplementary job)[a]	47 550	28 241
Total indirect costs		
Without supplementary job	28 694	22 098
With supplementary job	47 652	28 319
Total direct and indirect costs of death		
Without supplementary job	31 268	24 908
With supplementary job	50 226	31 102

Source: Pitayanon (1997).

[a] Based on an average of 30 lost work years for an HIV/AIDS death and 20 lost work years for a non-HIV/AIDS death with a 5 per cent discount rate.

TABLE 2. ESTIMATED AND PROJECTED LOSS OF LABOUR FORCE IN 2000 AND 2020
(Percentage)

Country	*2000*	*2020*
Namibia	3.0	26.0
Botswana	6.6	23.2
Zimbabwe	9.6	22.7
Mozambique	2.3	20.0
South Africa	3.9	19.9
Kenya	3.9	16.8
Malawi	5.8	13.8
Uganda	12.8	13.7
United Rep. of Tanzania	5.8	12.7
Central African Rep	6.3	12.6
Cote d'Ivoire	5.6	11.4
Cameroon	2.9	10.7

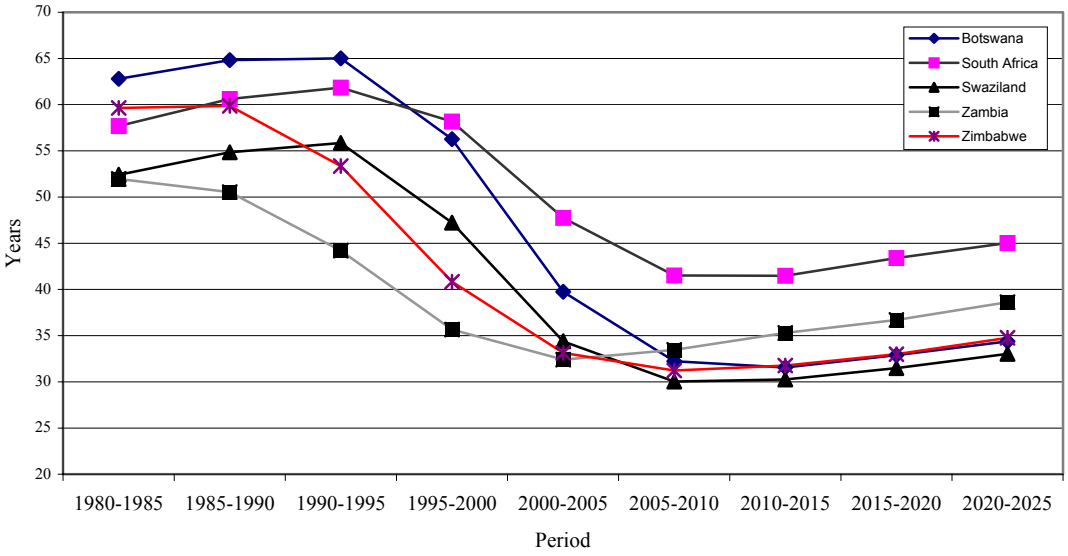
Source: FAO, 2001.

TABLE 3. NUMBER OF PRIMARY SCHOOLCHILDREN WHO LOST A TEACHER TO AIDS, 1999

Country	*Number of children who lost their teachers to AIDS*
South Africa	100 000
Kenya	95 000
Zimbabwe	86 000
Nigeria	85 000
Uganda	81 000
Zambia	56 000
Malawi	52 000
Ethiopia	51 000
United Republic of Tanzania	49 000
Democratic Rep. of Congo	27 000

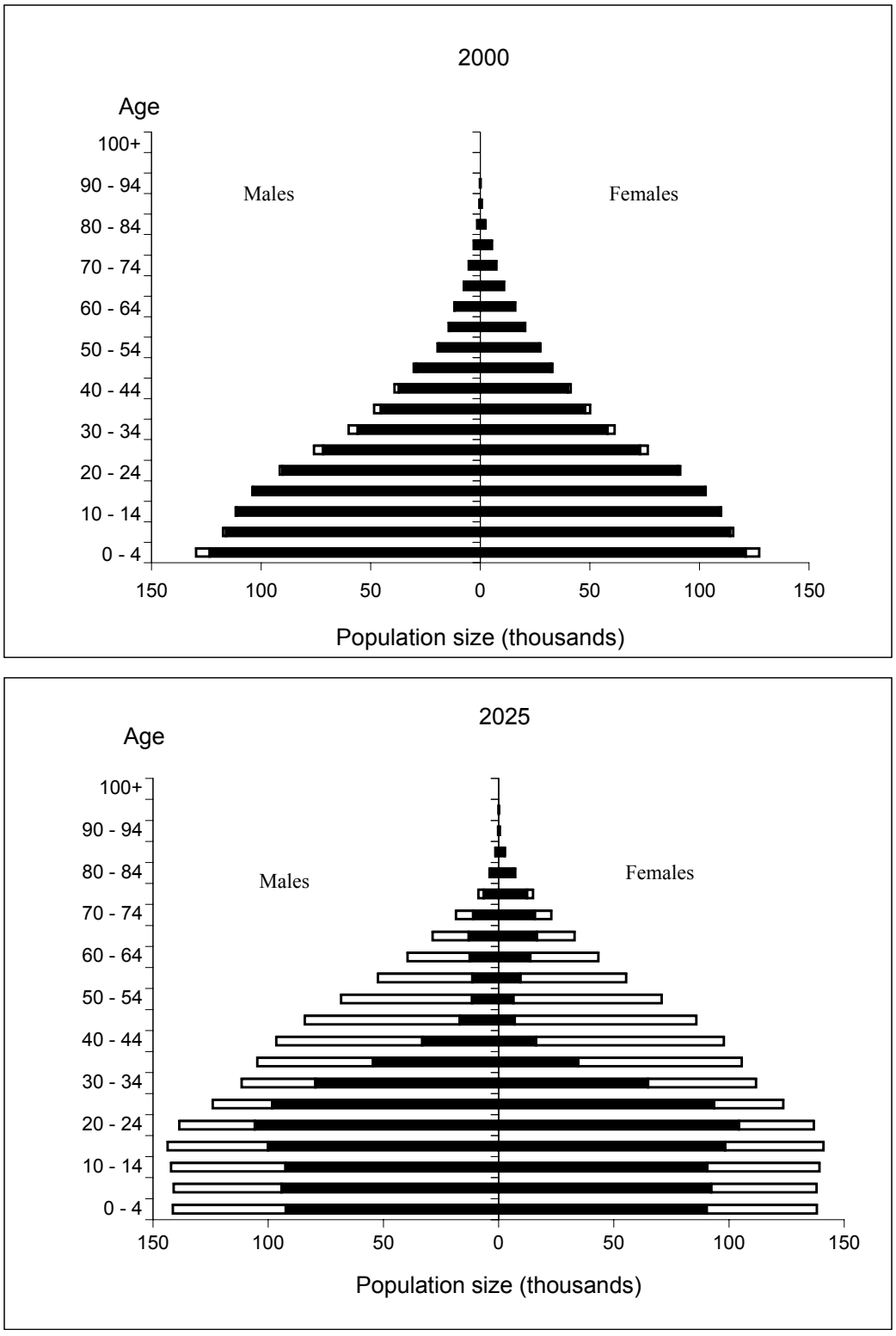
Source: UNAIDS and UNICEF (2000).

Figure I. Life expectancy at birth in selected most affected countries, 1980-1985 to 2020-2025



Source: United Nations Population Division, *World Population Prospects: the 2002 Revision.*

Figure II. Population size with and without AIDS, Botswana

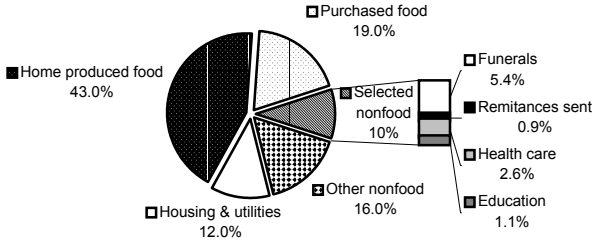


Source: *World Population Prospects:The 2002 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.03.XIII.6).

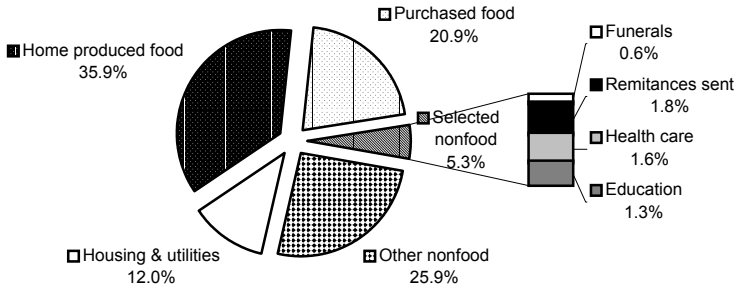
NOTE: Unshaded bars represent the hypothetical size of the population in the absence of AIDS. Shaded bars represent the actual estimated and projected population.

Figure III. Distribution of expenditure in Kagera, United Republic of Tanzania, 1991-1993

(a) Households which experienced an adult death in the past year

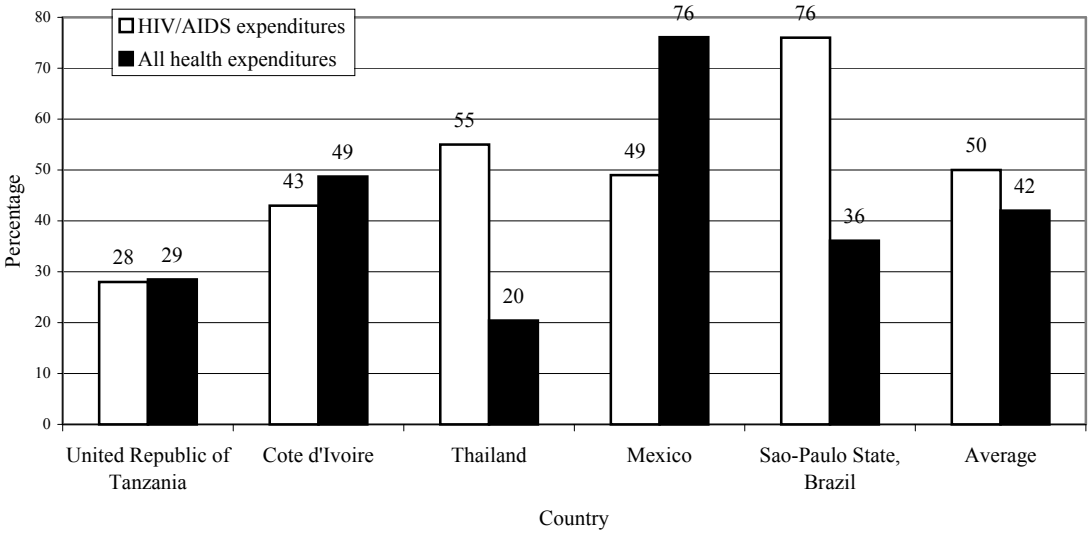


(b) Households which did not experience an adult death in the past year



Source: The World Bank, 1999.

Figure IV. Percentage of AIDS-related and total treatment expenditures financed by the national government, four selected countries and Sao Paulo, Brazil, 1994



Source: Shepard, 1998.