PART TWO

X. SUMMARIES OF SELECTED STUDIES ON THE IMPACT OF HIV/AIDS

Part II of *The Impact of AIDS* provides summaries of selected studies referred to in earlier chapters. For each study, the summary gives a brief overview of the objectives and results of the research. Much of the usefulness of the results depends on how a study was carried out. The summaries give information about the methodology, the size of the sample and whether it was representative, whether a control group was used and how the analysis was performed. The country or countries examined are shown, as are outcomes of interest and key results. Some literature reviews are also included.

The studies presented here are by no means an exhaustive review of work on the impact of HIV/AIDS. The volume of research under way means that results of studies are being published with great frequency. Some of the studies cited, such as conference papers and preliminary reports on ongoing research, have not yet been published, and others exist only in electronic form or in the grey literature. The summaries are arranged according to the order of chapters in the report, beginning with households and ending with impacts on economic growth.

A. STUDIES ON HOUSEHOLDS

Ainsworth, Martha, and Deon Filmer (2002). Poverty, AIDS and children's schooling: a targeting dilemma

Summary: The study analysed the relationship between orphan status, household wealth and child school enrolment using data collected in the 1990s from 28 countries in sub-Saharan Africa, Latin America, the Caribbean and Southeast Asia. Examples were found of large differentials in enrolment by orphan status, but in most cases the gap between children from richer and poorer households was more dominant. The gender enrolment gap was not substantially different from the gap between girls and boys whose parents were living. The enormous diversity across countries underscores the need to assess the specific country situation before considering mitigation measures.

Countries: **Western Africa**: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal and Togo; **Eastern Africa**: Kenya, Madagascar, Tanzania and Uganda; **Southern Africa**: Malawi, Mozambique, South Africa, Zambia and Zimbabwe; **Latin America**: Brazil, Guatemala and Nicaragua; **Caribbean**: Dominican Republic and Haiti; **Southeast Asia**: Cambodia.

Study area: Nationally representative samples from 34 Demographic and Health Surveys and five Living Standards Surveys.

Methodological approach: For asset ownership and housing characteristics: principal components analysis; for wealth status, orphanhood and enrolment status: regressions.

Sample size: Total sample sizes for children 7-14 ranged from 5,000 to 24,500, but most were about 5,000 to 10,000.

Control group: Orphans compared with other children in the general population.

Outcomes studied: Prevalence of orphans in 28 countries; wealth status of households with orphans; relationship between orphanhood and school enrolment; school gender gap.

Key results: In all countries, there were more paternal than maternal orphans, and some countries had two or three times as many paternal orphans. Only a small percentage of children aged 7-14 were two-parent orphans, ranging from 0.2 per cent in the Dominican Republic to 4.5 per cent in Uganda. In all countries, most single-parent orphans lived with the surviving parent, but in Eastern and Southern Africa, maternal orphans were less likely to live with their fathers than in other countries. Orphans aged 7-14 were less likely

to be enrolled in school than non-orphans in 22 of 28 countries, regardless of the overall enrolment level in the country. In Chad, Mali, Niger and Southern Africa, enrolment rates were similar for orphans and non-orphans, but in Nigeria and the United Republic of Tanzania, enrolment rates for orphans were higher than those for children with parents. Twenty-five of 28 countries had large differences in enrolment rates according to the wealth status of the household, but this did not always translate into a disadvantage for orphans. The relationship between orphan status, wealth status and the enrolment gender gap showed no clear pattern across countries of discrimination against female orphans.

Baier, E.G. (1997). The impact of HIV/AIDS on rural households/communities and the need for multisectoral prevention and mitigation strategies to combat the epidemic in rural areas

Summary: The study investigates the impact of HIV/AIDS on rural households in Eastern Africa. It shows the detrimental impact that HIV/AIDS may have on rural households' productive capacity. The paper suggests that the effects of HIV/AIDS are felt on two key farm production parameters. First, household labour quality and quantity are reduced, initially in terms of productivity when the HIV-infected person is ill and later when the supply of household labour falls with the death of that person. Moreover, the probability that more than one adult per family is infected is high, given the heterosexual nature of HIV transmission in Africa. A compounding factor is that infection rates are higher among women, who account for 70 per cent of the agricultural labour force and 80 per cent of food production. In addition, other household members will devote productive time to caring for the sick persons and observing traditional mourning customs, which can last as long as 40 days for some family members and can adversely affect labour availability.

The second factor in household agricultural production that HIV/AIDS will affect is the availability of disposable cash income. During episodes of illness, household financial resources may be diverted to pay for medical treatment and eventually to meet funeral costs. Such resources might otherwise be used to purchase agricultural inputs, such as occasional extra labour or other complementary inputs (e.g., new seeds or plants, fertilizer, pesticides). Family assets such as livestock might be sold off. If a household becomes unable either to supply such labour internally or to hire temporary workers, the composition of crops may be gradually altered, shifting from cash to subsistence crops in some cases. The key constraint will be during periods of peak labour demand, usually in planting and harvesting seasons. Given the nature of the rural labour market, those seasons are also the times when wages or opportunity costs are highest. Another response to labour shortages may be to reduce the area under cultivation. Furthermore, it is likely that livestock production may also be less intensive and that the farming quality will be affected, with weeding and pruning activities curtailed. The shift from high labour-intensive crops to low labour-intensive crops will curtail vegetable cultivation, resulting in a less varied and less nutritious diet. Labour-intensive farming systems with a low level of mechanization and agricultural input are particularly vulnerable to the impact of the disease.

Countries: Uganda, United Republic of Tanzania and Zambia.

Study area: Rural areas of the selected countries.

Methodological approach: Not stated, rapid rural appraisal.

Control or comparison group: Not applicable.

Sample size: Not stated.

Outcomes studied: Agricultural production, farm income, livestock production, medical expenses and funeral costs.

Key results: Decline in farm income, decline in cropping intensity and livestock, increase of medical expenses and funeral costs.

Basu, Alaka M., Devendra B. Gupta and Geetanjali Krishna (1997). The household impact of adult morbidity and mortality: some implications of the potential epidemic of AIDS in India

Summary: The study examined how socio-economic status affected the risk of contracting HIV and the nature and extent of the impact of fatal illness on household welfare. Most households with an illness or death could expect little help from government benefits or employer-subsidized insurance and had to bear the burden of medical expenses themselves. The larger extended family or kin group provided the main cushion for absorbing a crisis such as an AIDS-related illness or death. The most common response to loss of income from a family member's illness or death was to seek loans; savings and assets were too small to play a major role in coping strategy. Self-employed households were better able to substitute other household members for the incapacitated individual than were wage-earning households.

Country: India.

Study area: Delhi.

Methodological approach: This exploratory study used a structured survey complemented by qualitative data collection, including in-depth anthropological studies. Since prevalence rates are still low in India, the researchers focused on the hypothetical case as a way to understand the economic impact of a major illness on households. This method was supplemented by case studies of households that had actually experienced an adult death.

Sample: A representative sample of men aged 19 to 39 from all parts of Delhi, ranging from slums to upper-income neighbourhoods. The sample frame came from a larger recent survey of the city.

Sample size: Interviews with 484 men; case studies of 33 households that had experienced an adult death in the last two years.

Control or comparison group: No.

Outcomes studied: Relationship between socio-economic status and probability of contracting HIV/AIDS; impact of the illness or death of an adult family member and coping strategies practised by families.

Key results: The study was theoretical, so direct estimates of impacts were not made. However, relationships between contracting the disease and dealing with it are elucidated, and suggestions that would lessen the impact of HIV/AIDS by taking advantage of the unique cultural and household supports available in Indian families are offered for policy makers. The study found that general awareness of HIV/AIDS was high but that erroneous notions about the illness persisted, in spite of an extensive information campaign. During the initial stages of the AIDS epidemic, the better-off groups seemed to be more susceptible to acquiring the infection than poorer groups because they could afford the kind of high-risk lifestyle that increased their susceptibility. However, the profile of AIDS sufferers was found to be changing rapidly, with increasing numbers of infections occurring in the individuals least able to prevent or deal with the spread of the disease.

The impact of the death of an adult household member varied along standard socio-economic lines, with poor households bearing proportionately more of the costs of the illness and death of a family member. However, the study also looked at other social and cultural attributes that affect a household's ability to cope. For example, in many families women do not join the labour force after the death of a spouse because the society considers it inappropriate for a woman to work outside the home. At the same time, family structure may mitigate the impact of a crisis; joint families had greater access to help and other resources than did nuclear families. Case study interviews confirmed that the larger family unit provided substantial help to family members of an ill adult male.

Béchu, N. (1997) The impact of AIDS on the economy of families in Côte d'Ivoire: changes in consumption among AIDS-affected households

Summary: The study investigated the impact of AIDS on household consumption in Côte d'Ivoire.

Health-care expenditures were greater in households with an AIDS victim during the first year after diagnosis of the disease but fell as the disease progressed. The findings conflicted with the hypothesis that the consumption of health care rises as the disease becomes more serious and appeared to indicate that persons with AIDS became less interested in care—both modern and traditional—that could not cure them. Consumption in households with an AIDS death declined and did not return to former levels after the AIDS death.

Country: Côte d'Ivoire.

Study area: Urban and semi-rural areas.

Methodological approach: Households selected were monitored for consumption patterns in multiple rounds of a survey. Categories of consumption included basic needs, other current expenditures, exceptional expenditures and the patient's health expenditures.

Sample: The study was part of a larger survey of 600 households in Burundi, Côte d'Ivoire and Haiti. Households were selected after being identified by a health facility as containing an adult with AIDS. At least one adult in the selected households had to be ill with AIDS and had to be responsible for one or more children.

Sample size: Of 200 households in the Côte d'Ivoire sample, 120 were followed over a period of 20 months. The data for the study were from 107 of the 120 households (87 from urban areas and 20 from semi-rural areas); interviews were conducted six times at two-month intervals.

Control group: Consumption data were compared with the results of a study conducted in Yopougon, the second largest district in Abidjan, and were based on a sample of 2,064 households.

Outcomes studied: Changes in consumption of households with an AIDS-infected member as the illness progressed and the ill person died.

Key results: Households with an AIDS patient spent almost twice as much of their household budgets (10.6 per cent) on health care as did households in the comparison group, and health care costs for the person with AIDS accounted for almost 80 per cent of the household health budget. Consumption per household member declined during the first year after AIDS was diagnosed. However, health care consumption by the person with AIDS fell by almost one half between the first and fourth rounds of the survey, suggesting that persons with AIDS no longer sought care that could not cure them. In households with an AIDS death, consumption of food declined, but a general upturn in consumption was observed after a few months. Households with an AIDS death did not return to their earlier level of consumption.

Bicego, George, Shea Rutstein and Kiersten Johnson (2003). Dimensions of the emerging orphan crisis in sub-Saharan Africa

Summary: The study used recent data from the Demographic and Health Surveys to examine (a) the levels, trends and differentials of orphanhood in 17 countries in sub-Saharan Africa and (b) trends and age-patterns in orphan prevalence and welfare in the 1990s for five countries with a wide range of HIV prevalence levels (1.4 to 25.1 per cent). Findings showed a strong correlation between orphanhood prevalence and national adult HIV prevalence estimates, although the relationship was affected by the timing of the onset of the disease. Orphans were more likely to live in households headed by females or grandparents than were non-orphans. In general, orphans did not live in poorer households than non-orphans, although this varied across countries. Losing one or both parents was significantly associated with lower educational attainment.

Countries: For the prevalence study: Benin, Cameroon, Chad, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe. For the in-depth study: Ghana, Kenya, Niger, United Republic of Tanzania and Zimbabwe.

Study area: Nationally and regionally representative samples.

Methodological approach: Univariate and multivariate analysis, logistic regressions.

Sample size: Average sample size was from 5,000 to 8,000 households per country.

Control group: Orphans compared with other children in the general population.

Outcomes studied: Level and trend of orphanhood compared with national HIV/AIDS prevalence rate; likelihood of living in female-headed or grandparent-headed household; economic situation of households with orphans; schooling opportunities for orphans.

Key results: Maternal orphan prevalence ranged from less than 2.5 per cent in Mali and Niger to more than 4.5 per cent in Malawi, Mozambique, Uganda and Zimbabwe. Paternal orphanhood was higher in every country and ranged from about 4 per cent to more than 8 per cent. The percentage of orphans who had lost both parents was higher in severely impacted countries in East and Southern Africa (10-17 per cent of all orphans) than in West and Central Africa (4-8 per cent). Earlier onset of the disease was associated with higher orphan prevalence. Orphans were much more likely than non-orphans to live in households headed by grandparents—one fourth to one half of orphans compared with 10-20 per cent of non-orphans. In Zimbabwe, 50-55 per cent of orphans lived in households headed by grandparents. Orphans were also more likely than non-orphans to live in female-headed households, but the differential varied across countries. Orphans were less likely than non-orphans to be at the proper educational level for age. East African double orphans 6-10 years old were only half as likely as non-orphans to be in the appropriate grade, and double orphans 11 to 14 were two thirds as likely to be in the proper grade.

Bloom, David E., Ajay Mahal, Lene Christiansen, Amala de Silva, Soma de Sylva, Malsiri Dias, Saroj Jayasinghe, Swarna Jayaweera, Soma Mahawewa, Thana Sanmugam and Gunatillake Tantrigama (1997). Socio-economic dimensions of the HIV/AIDS epidemic in Sri Lanka

Summary: This multidisciplinary study used both theoretical statistical evidence (projections based on a variety of assumptions) and survey research to estimate the vulnerability of Sri Lanka to HIV/AIDS. It used data from economics, statistics, anthropology, sociology and medicine as well as information about the spread of the epidemic in other countries to analyse the social and economic roots of HIV/AIDS in Sri Lanka. The objective of the study was to understand the epidemic before its full force reached Sri Lanka and to inform policy-making for the development of prevention and care strategies rooted in local realities. Using current assumptions about the future progress of the disease, the authors estimated that the AIDS epidemic would have an insignificant impact on the macroeconomy of Sri Lanka in the foreseeable future. Moreover, the epidemic was expected to have a negligible effect on Sri Lanka's level on the human development index. With regard to the impact on poverty and income distribution, evidence from surveys conducted by the authors suggested that better educated and higher-income people were more aware of the risks of AIDS and less likely to engage in risky behaviour, so an epidemic could increase inequality in the population.

Although at the time of the study HIV prevalence rates were low in Sri Lanka, the evidence suggested that the country was not immune to the epidemic, given its proximity to India and its high rate of international mobility associated with overseas contract work, tourism, military activity and refugees. Other factors that contributed to the country's vulnerability were unsafe medical practices, the commercial sex industry and a large proportion of the population in the sexually active years.

Country: Sri Lanka.

Methodological approach: Literature review of epidemiology of HIV/AIDS in various parts of the world. Cost-benefit analysis of screening the supply of blood, using disposable injection equipment and adopting universal precautions in health-care settings (that is, treating all patients as potential sources of infection). Economic analysis of medical costs of a future AIDS epidemic in Sri Lanka using hospital and clinic records to estimate future medical costs. Small surveys to examine links between income, educational status, knowledge of HIV/AIDS and risky behaviour. Economic analysis of the distribution of direct and indirect costs

of the AIDS epidemic to examine which segments of society absorb most of the costs of AIDS. Regression analysis of effect of AIDS epidemic on tourism.

Sample size: For study of education, income, knowledge of HIV/AIDS and risky behaviour, about 450 individuals were surveyed. For study of risky behaviour among workers in free trade zones, 50 female workers were interviewed. For study of overseas workers, 50 Sri Lankan women who had worked abroad were interviewed. For study of knowledge and risks of sex workers, 100 commercial sex workers were interviewed. For study of high-risk sexual behaviour among prisoners, 50 prisoners were interviewed. For study of the burden of AIDS costs, 34 families of AIDS victims were surveyed.

Control or comparison group: Not applicable.

Outcomes studied: The socio-economic dimensions of the HIV/AIDS epidemic in Sri Lanka, including the link between HIV and poverty; the benefits of blood testing; the cost-effectiveness of using disposable needles and syringes; the cost of adopting universal precautions in the medical care system; the economic burdens of the AIDS epidemic; individuals' perceptions of the risk of contracting AIDS and their willingness to pay to reduce the risk; the effect of an AIDS epidemic on the tourist industry.

Key results: An AIDS epidemic in Sri Lanka is expected to have only a small impact on the nation's economic growth and human development index. Less educated and lower-income individuals were found to be more likely to engage in risky behaviour and more likely to acquire HIV/AIDS. The medical costs of an epidemic would most likely be borne by taxpayers, since most health care in Sri Lanka is provided by public-sector health facilities. However, only the families of victims would bear the psychological costs of ostracism and stigmatization. Regression analysis of the relationship between AIDS prevalence and tourism found no statistical significance. A small survey of workers in free trade zones found little evidence to support the view that those workers were a group with a high risk of becoming infected with HIV. Testing blood for HIV infection was thought to be cost-beneficial under the high-prevalence scenario; using disposable syringes and needles was expected to be economically justified; and instituting universal precautions in health care settings in Sri Lanka was found not to be cost-beneficial at the time the study was conducted.

Booysen, Frikkie (2003). Poverty dynamics and HIV/AIDS-related morbidity and mortality in South Africa

Summary: The socio-economic impact of HIV/AIDS on households was examined using a cohort study of households affected by the disease and comparing them with a control group of households not currently affected. Affected households were more likely to experience poverty, but some poverty may have been transitory. Preliminary analysis suggested that HIV/AIDS-related determinants of poverty, in particular morbidity, explain why certain households are poorer than others and are likely to remain poor. Economic policies focusing on job creation and a social safety net targeting AIDS-related poverty should be considered for the short to medium term. The study is ongoing: three rounds of interviews have been conducted and analysed.

Country: South Africa.

Study area: One urban (Welkom) and one rural (QwaQwa) community in the Free State province in which HIV/AIDS is particularly prevalent.

Methodological approach: Longitudinal study, household interviews; descriptive analyses, simple mobility profiling and regression analysis.

Sample size: 355 households.

Control group: Yes.

Outcomes studied: Poverty level of AIDS-affected households compared with that of households not affected; income mobility of households affected by HIV/AIDS; incidence and severity of poverty; morbidity and mortality as determinants of chronic poverty.

Key results: Households affected by HIV/AIDS were more likely than unaffected households to be poor, regardless of the measures employed in measuring poverty. Households that experienced illness or death, especially in the recent past, had the most severe poverty and were more than twice as likely to be chronically poor than non-affected households. Affected households at the lower end of the income distribution were less mobile than other households. Households that experienced more deaths were less likely to improve their position in the income distribution and more likely to remain in poverty.

Busingye, J., J. Pickering, A. Ruberantwari and J. Whitworth (2003). Orphans in the HIV/AIDS era: a study in rural Uganda

Summary: The project studied the dynamics of the HIV-1 virus and its impact on a rural African population. The overall prevalence of orphans was found to be increasing over the course of the study, and the loss of a father was more common than the loss of a mother at all time periods. HIV-1 seropositivity rates were significantly higher among orphans than among non-orphans, and they were also higher among surviving parents of orphans as compared with parents of non-orphans. The study concluded that the orphan burden had been rising in the population and was associated with the HIV epidemic.

Country: Uganda.

Study area: A cluster of villages in southwestern Uganda.

Methodological approach: A general population cohort was established in 1989-1990, and the cohort was followed annually using face-to-face questionnaires and serological surveys. Questions on orphanhood (loss of one or both parents) were asked at survey rounds 1, 9 and 12 for children under the age of 15. HIV testing was done for all consenting adults at the three time points and for children under 13 at rounds 1 and 12.

Sample size: Not given.

Control group: No; survey of the general population.

Outcomes studied: The impact of the HIV-1 virus on a rural African population; orphan prevalence and seropositivity rates among children and parents over time.

Key results: The overall orphan prevalence increased from 10.4 per cent at survey round 1 to 16.8 per cent and 15.4 per cent at survey rounds 9 and 12 respectively. The loss of a father was more common than the loss of a mother at all three rounds. The prevalence of orphans who had lost both parents increased from 1.3 per cent at survey round 1 to 3.3 per cent at round 9 and round 12. HIV-1 seropositivity rates were significantly higher among orphans than among non-orphans and were higher as well among surviving parents of orphans as compared with parents of non-orphans.

Case, Anne, Christina Paxson and Joseph Ableidinger (2003). Orphans in Africa

Summary: The study used data from 19 Demographic and Health Surveys conducted in 10 countries between 1992 and 2000 to study the living arrangements and school enrolment of orphans and non-orphans in sub-Saharan Africa. The 10 countries accounted for about 50 per cent of the AIDS orphans living in sub-Saharan Africa. The researchers found that orphans lived in poorer households than non-orphans and were significantly less likely than non-orphans to be enrolled in school. Poverty did not explain the lower school enrolment, however: orphans were equally less likely to be enrolled in school relative both to non-orphans as a group and to the non-orphans with whom they lived. Outcomes for orphans depended largely on how closely related they were to the household head. Orphans who lived with distant relatives or with non-relatives were less likely than non-orphans to be enrolled in school. There was no evidence that female orphans were systematically disadvantaged.

Countries: Ghana, Kenya, Malawi, Mozambique, Namibia, Niger, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: Nationally and regionally representative sample.

Methodological approach: Multiple regression analysis.

Sample size: Country samples ranged from 8,339 to 28,888.

Control group: No; surveys of the general population.

Outcomes studied: Orphan rates by age of children; living arrangements of orphans (three mutually exclusive groups: maternal orphans, paternal orphans and double orphans) compared with those of non-orphans; household wealth of orphans and non-orphans; school enrolment of orphans.

Key results: Roughly 10 per cent of the children in the surveys had lost one or both parents. On average, 2.4 per cent of children were maternal orphans, 5.7 per cent were paternal orphans and 2 per cent were double orphans. In most countries, more children had lost a father than a mother. Children who had lost one parent were less likely than non-orphans to live with the surviving parent in all countries examined, and this disparity was more pronounced in later surveys. In Zambia, for example, only 40 per cent of maternal orphans lived with their fathers, as compared with 74 per cent of non-orphans. Orphans on average lived in poorer households than non-orphans, and paternal orphans were the most disadvantaged. In all countries, orphans were more likely to live in households with a higher fraction of elderly persons, with less well-educated heads and with female heads. Orphans of any type were less likely to be in school than non-orphans with whom they lived, and in most countries double orphans were 10 to 30 percentage points less likely to be in school. Lower enrolment was not due solely to orphans' poverty but was explained in part by the relationship of the orphan to the head of household. The probability of school enrolment was inversely related to the closeness of the relationship.

Floyd, Sian, Amelia C. Crampin, Judith R. Glynn, Nyovani Madise, Andrew Nyondo, Masiya M. Khondowe, Chance L. Njoka, Huxley Kanyongoloka, Bagrey Ngwira, Basia Zaba and Paul E. M. Fine (2003). The impact of HIV on household structure in rural Malawi

Summary: The study investigated the impact of HIV on household structure over a period of more than ten years. Earlier results had found that the impact of HIV on adult and child mortality was substantial. The ten-year survival rate was 36 per cent among HIV-positive individuals as compared with 90 per cent among initially HIV-negative individuals; under-five child mortality rates were 46 per cent for children born to HIV-positive mothers and 16 per cent for those born to HIV-negative mothers. Further analysis found substantial impacts on household structure. Marriages in which one partner was HIV-positive in the baseline survey were much less likely to be intact at the follow-up survey. Only about one fifth of spouses were still married to a partner who had been HIV-positive in the baseline survey. Remarriage rates for widows or divorced female spouses were lower for wives of HIV-positive men. Younger women were more likely to remarry, as were women whose marriages had ended in divorce rather than widowhood. For men, there was no evidence of an effect of HIV status on the rate of remarriage. Surviving male spouses were almost always the head of the household in which they were living, regardless of the spouse's HIV status. Widowed and divorced female spouses were much less likely to be household heads, especially if their husbands had been HIV-negative.

Children of the baseline survey respondents who were less than 15 years old at the time of the follow-up survey were much more likely to be alive and resident in the district if their parents had been HIV-negative in the original survey. Among surviving children 18 or under, the per

centage living with neither parent was much higher for those born to HIV-positive individuals. Young adult offspring (aged 15 to 25) who were tested for HIV were found to have about the same prevalence rates regardless of their parents' HIV status at the time of the original survey.

Country: Malawi.

Study area: Karonga district, northern Malawi.

Methodological approach: Retrospective cohort study with more than ten years of follow-up. From population-based surveys conducted in the 1980s, 197 "index individuals" aged 14 to 68 were identified as HIV-positive, and 396 HIV-negative index individuals were selected as a comparison group. They were individually matched to the HIV-positive index individuals on the characteristics of age, sex, area of residence, interview date and household structure, and they, together with spouses and offspring, were sought for reinterviews in 1998-2000.

Sample size: 197 HIV-positive individuals and 396 HIV-negative individuals.

Control group: Yes.

Outcomes studied: The impact of HIV status on the spouses of infected individuals in terms of widowhood, remarriage and their relationship to household head. The impact of HIV status on the offspring of infected individuals in terms of living with parents, relationship to household head, dependency ratio in the household, marital status and age at first marriage.

Key results: Only one in five marriages in which one partner was HIV-positive at the baseline survey was still intact at the follow-up survey; remarriage rates for widows or divorced female spouses were lower for wives of HIV-positive men; remarriage rates for men did not seem to be affected by the HIV status of their wives at the baseline survey; children of HIV-positive parents were much less likely to be alive and resident in the district at the follow-up survey than children of HIV-negative parents; among surviving children 18 or under, those whose parents were HIV-positive at the initial survey were much more likely to be living with neither parent at the follow-up survey.

Gertler, Paul, David Levine and Sebastian Martinez (2003). The presence and presents of parents: do parents matter for more than their money?

Summary: The study examined the effects of the death of a parent on investments in the health and education of surviving children in Indonesia. Parental loss is hypothesized to operate on child investment through a reduction in household resources and removal of parental presence, including loss of mentoring, transmission of values and emotional and psychological support. The study found that children who had lost a parent were less likely to be in school and were less healthy than children whose parents had lived. However, the reduction in economic resources measured by the change in household consumption explained only a small portion of the effect of parental death. Parental presence in the household is thought to play an important role in investments in child human capital.

Country: Indonesia.

Study area: 312 communities in 13 provinces in Indonesia.

Methodological approach: Data from the 1993 and 1997 rounds of the Indonesia Family Life Survey (IFLS) were used; variables included school enrolment status, schooling history, anthropometric data, household and community-level variables, household consumption and adult deaths. Six regression models with random and fixed effects were specified.

Sample size: 6,185 children in 3,378 households.

Control group: Survey of the general population; comparisons between orphaned children and others.

Outcomes studied: Changes in household consumption; school enrolments and dropouts; changes in child health and nutritional status (mortality, height for age, weight for age, weight

for height, body mass index, stunting and wasting).

Key results: Among children who lost a parent, those with deceased fathers were more likely to drop out of school, whereas those whose mothers had died were less likely to start school. Children in households with higher consumption and children with educated and healthy mothers were more likely to start school than others. Children whose mothers had died were more likely to die than those who had not lost a parent. Paternal death had no effect on children's health, but the effect of maternal death was large and statistically significant, especially for measurements related to weight. Bereaved children were generally less healthy than children whose parents had lived.

Hosegood, Victoria, Kobus Herbst and Ian Timæus (2003). The impact of adult AIDS deaths on households and children's living arrangements in rural South Africa

Summary: The AIDS epidemic is now well advanced in sub-Saharan Africa, but studies of the impact of AIDS mortality on households and communities are still scarce. South African rural households are characterized as very fluid social units, presenting a complex range of forms and development cycles. The data-collection system of the Africa Centre Demographic Information System (ACDIS) is designed to reflect social dynamics and residential mobility. The study explores the impact of young adult deaths on household dissolution, composition, migration and the co-residency arrangements of household members, as well as the patterns of care, education and welfare for children orphaned as a result of the adult deaths. The study found that households with an adult death were much more likely to dissolve than other households, but that migration of household members was more likely than migration of the whole household. Generally, households were unable to replace members who died; both the death of a household member and the out-migration of surviving members caused a decrease in household size. Children under 15 in households with an adult death were more likely to migrate during the year, especially if a parent had died. The movement and fostering of children in response to difficulties was a common strategy in rural South Africa even before the HIV/AIDS epidemic.

Country: South Africa.

Study area: Rural district of Umkhanyakude in northern KwaZulu Natal.

Methodological approach: ACDIS longitudinal data collected every four months for one year (2000-2001) from 10,490 households constituted the data set. Multivariate hazard models were used to analyse the impact of young adult deaths on household structure.

Sample size: 10,490 households in rural KwaZulu Natal.

Control group: Longitudinal survey of the general population; comparisons between households that experienced an adult death and other households.

Outcomes studied: The impact of young adult deaths on households; arrangements for caring for children orphaned as a result of the adult deaths.

Key results: Household instability (dissolution and migration) was significantly associated with younger heads, female heads and death of a household member. Five per cent of households experienced at least one AIDS death during the one-year observation period, and they were nearly three times as likely to have dissolved by the end of the year than other households. Only a very small number of child-headed households was found.

Janjaroen, W. (1997). The impact of AIDS on household composition and consumption in Thailand

Summary: The paper examines two questions: (a) what is the household structure and composition in households with and without an adult death? and (b) among households with and without an adult death, what are the factors affecting the change in household consumption?

Country: Thailand.

Study area: Five districts in Chiang Mai Province in the upper north of Thailand: Mae Rim, San Sai, San Kamphaeng, Hang Dong and Fang districts.

Sample: A total of 361 households were interviewed: 116 households with a death from AIDS, 100 households with a death from another cause and 108 households with no death.

Methodology: Selection of sample households with AIDS deaths and non-AIDS deaths from among those deaths that had occurred in the public health facilities. A sample without a death was also identified. A survey questionnaire was administered to each household. The household respondent was either the household head or his/her representative who could provide the information.

Control group: Yes.

Outcomes studied: Household structure and composition and household consumption.

Key results: The average household size for households with a death resulting either from AIDS or from other causes was smaller than that of households without any death (3.1 versus 4.0). The results suggest that the households without deaths had higher consumption levels than those with deaths, but the differences between the two groups were very small and not statistically significant. The regression analysis showed that, after controlling for other variables, AIDS deaths had a larger negative impact on consumption than did deaths from other causes. The association remained after controlling for the duration of the illness.

Knodel, John, Wassana Im-em, Chanpen Saengtienchai, Mark VanLandingham and Jiraporn Kespichayawattana (2002). The impact of an adult child's death due to AIDS on older-aged parents: results from a direct interview survey

Summary: The study describes the methodology and findings of a direct interview survey in Thailand of parents of deceased adult children who died of AIDS and a comparison group of older-age parents who had not suffered such a loss. The results provide extensive information on living arrangements, parental caregiving, health impacts, spouses and orphaned children; care, treatment and funeral expenses; longer-term economic impacts; and community reaction. The detailed results show considerable diversity in the extent to which parents are impacted. Clearly, personal caregiving and instrumental assistance by parents, especially the mother, can be very demanding. Even when a parent is a main caregiver, other family members, particularly other adult children, often assist the parental caregiver. Parents also often serve as critical links between their ill adult child and the health-care system. Caregiving often takes a toll on the emotional and physical health of the parental caregiver at the time care is being provided. Only a minority of the AIDS parents had fostered grandchildren left behind by their deceased son or daughter. Overall, the loss of a child to AIDS has a serious economic impact for only a minority of AIDS parents. At the same time, the poor appear to be the most adversely affected. Sustained social stigma directed at parents of persons who died of AIDS is far from universal in Thailand at present. Sympathetic and supportive reactions from others in the community are more frequently reported than negative ones (authors' abstract).

Country: Thailand.

Study area: Chiang Mai, Rayong and Phichit provinces.

Methodological approach: Direct interview survey of parents of adult children. Sites were chosen on a purposive basis and included both rural and urban areas. Health personnel in each district chose suitable sites and identified households that had experienced an AIDS death and households with persons of comparable age, marital status and economic background who had at least one living adult child and who had not experienced a recent death among their children.

Sample size: Interviews were conducted with 394 AIDS parents and 376 non-AIDS parents. Information provided about spouses meant that the interviews generated data for 649 AIDS parents and 621 non-AIDS parents.

Control or comparison group: Yes.

Outcomes studied: Impact on older parents of the illness and AIDS-related death of an adult child compared with parents who suffered no such death; role of parents in caregiving and seeking health services for their ill child; economic consequences of child's illness and death; and effects on parents of the social stigma related to AIDS.

Key results: Overall, the loss of a child to AIDS has a serious economic impact for only a minority of AIDS parents. At the same time, the poor appear to be the most adversely affected. In Thailand at present, sustained social stigma is not universally directed at the parents of persons who died of AIDS. The impact of losing a potential provider of care in old age may not become apparent until long after the adult child's death. However, most AIDS parents had other children to help with their care in old age.

Knodel, John, and Wassana Im-em (2002). The economic consequences for parents of losing an adult child to AIDS: evidence from Thailand

Summary: In the paper the authors examined the economic consequences for parents of losing an adult child to AIDS in Thailand, with an emphasis on the effects of parental caregiving. Their main findings are as follows: (a) parents were frequently and substantially involved in the payment of care and treatment costs, but government health insurance and, to a lesser extent, welfare helped alleviate the financial burden this created; (b) only a minority of AIDS parents fostered grandchildren left behind by their deceased son or daughter; (c) most deceased children had contributed financially to the parental household before becoming ill, but only a minority had been main providers. However, poor parents were far more likely than better-off parents to lose a main provider and for this to create severe financial hardship; and (d) poorer parents spent much less money than better-off parents on expenses, but the burden created by expenses was far greater for poorer than for better-off parents. One important implication of these findings is that programmes are needed that recognize and address the plight of older persons who lose a child to AIDS. The programmes need to take into account the considerable range of vulnerability that exists and target those who are particularly susceptible to resulting economic hardship (authors' abstract).

Country: Thailand.

Study areas: Key informant study: Bangkok and eight provinces; direct interview survey: Chiang Mai, Rayong and Phichit provinces; open-ended interviews: Bangkok and three provinces.

Methodological approach: The analysis draws on three data sets that were collected as part of a comprehensive study of the impact of the AIDS epidemic on older persons in Thailand. The sources of data are based on different methodological approaches: interviews with key informants about individual AIDS cases and their families; direct survey interviews with parents whose adult child had died of AIDS and parents with similar characteristics who did not experience the death of an adult child; and open-ended interviews with AIDS parents. The first two were designed to yield data suitable for quantitative analysis and the third to yield data suitable for qualitative analysis. Neither of the first two surveys was based on a probability sample. Informants were identified by health personnel.

Sample size: Data for 768 adults who died (including 258 for whom supplemental information was also collected) were obtained through interviews with key informants, most of whom were staff or volunteers at local health centres; interviews with 394 AIDS parents and 376 comparison parents generated data on 649 AIDS parents and 621 comparison parents; open-ended interviews were conducted with 19 AIDS parents.

Control or comparison group: Yes, in direct survey interview portion of the study.

Outcomes studied: Economic consequences for parents of losing an adult child to AIDS.

Key results: Older Thai parents were extensively involved with their infected adult children through both living and caregiving arrangements. Return migrants constituted a substantial share (32-40 per cent) of adult children with AIDS for whom parents provided care during the terminal stage of

illness. Parents bore substantial financial burdens for an adult child who died of AIDS. They included costs of caregiving; medical costs for treatment; disruption of their own economic activities; and funeral costs. Costs to parents were moderated by government health insurance and welfare and by membership in funeral societies. Poor parents spent less on expenses than better-off parents, but the burden of expenses was more likely to create financial hardships for poor parents. Overall, the loss of a child to AIDS had a serious economic impact for only a minority of AIDS parents in the sample.

Menon, Rekha, Maria J. Wawer, Joseph K. Konde-Lule, Nelson K. Sewankambo and Chuanjun Li (1998). The economic impact of adult mortality on households in Rakai district, Uganda

Summary: The study assesses the economic impact of adult mortality on households in the Rakai district in southwestern Uganda. An issue of concern, especially in the case of the AIDS epidemic, is the impact of a "shock" to the household caused by the death of an economically active adult. The death of an economically active adult may result in changes in household size and composition and a decline in the household's socioeconomic status. In response to the shock of a fatal adult illness like HIV/AIDS, households may liquidate their assets to pay for medical treatment and funeral costs. Using information regarding adult mortality in households between 1989 and 1992 in the Rakai district of Uganda, this study attempts to provide a better understanding of the impact of an adult death on a household's composition, size and economic status.

Country: Uganda.

Study area: Rakai district.

Sample: The analysis focuses on the 1,945 households that were enrolled in the study, beginning in 1989-90 and followed until 1992.

Control group: Longitudinal survey of the general population; comparisons between households experiencing an adult death and other households.

Methodology: A longitudinal sero-epidemiological study was conducted between 1989 and 1992 in the Rakai district in southwestern Uganda.

Outcomes studied: Household composition and household ownership.

Key results: Households affected by an adult death altered their size and composition. Households with an adult AIDS death incurred economic losses through a depletion of some durable goods. Households in which the deceased was male were seven times more likely to suffer a reduction in ownership of durable goods than households where the deceased was female. It is possible that this effect was due to a loss in income in the household as a result of the death of an economically active adult.

Monasch, Roeland, and Nigel Snoad (2003). The situation of orphans in a region affected by HIV/AIDS

Summary: About 11 million children under the age of 15 have lost their mother, father or both parents to AIDS in sub-Saharan Africa, and the number is expected to double by 2010. The study examined data in 40 sub-Saharan countries and looked at living arrangements of orphans and characteristics of households where they live. Nearly one third of single-parent orphans were found to be living apart from their remaining parent. The impact of orphanhood on children was explored by analysing data on school attendance, nutritional status and child labour. The study found that living arrangements of children in countries with high HIV-prevalence rates differed significantly from those in other countries. Families and communities were generally responsible for the care of orphans in the countries most affected by HIV/AIDS. The composition of the households in which orphans lived was found to differ from one country to another. Overall, orphans were found to have less schooling and to be more involved in child labour than other children.

Country: Forty countries in sub-Saharan Africa.

Methodological approach: Cross-national comparison of data from nationally representative population-based surveys conducted between 1997 and 2001. Surveys included Multiple Indicator Cluster Surveys (MICS), organized by UNICEF, and Demographic and Health Surveys.

Sample size: Samples ranged from 6,200 children in Sao Tome and Principe to 66,345 children in northern Sudan. Average survey size was 18,474 children.

Control group: Surveys of the general population; comparisons between orphans and other children.

Outcomes studied: Living arrangements of AIDS orphans and characteristics of households where they live; school attendance, nutritional status and child labour status of AIDS orphans.

Key results: The death of parents had significant implications for orphans in terms of households and living arrangements and well-being. Orphans were less likely to attend school than non-orphans, especially in countries with lower overall school attendance. Orphanhood did not seem to be associated with being malnourished in most countries.

Mushati, P., S. Gregson, M. Mlilo, J. Lewis and C. Zvidzai (2003). Adult mortality and the economic sustainability of households in towns, estates and villages in AIDS-affected Eastern Zimbabwe

Summary: The study examined the consequences of adult terminal illness and death for households in eastern Zimbabwe. In a country with an HIV prevalence rate exceeding 20 per cent, little information was available about the effects on households of an extended period of crisis mortality. Primary caregivers of deceased adults were interviewed about household income, expenditure on health care and funeral expenses, asset sales and relocation after the death. The study found that heavy expenditure, substantial loss of income and erosion of capital assets were associated with the terminal illness and death of an adult household member. The expenses were seriously undermining the economic viability of households in the principal socio-economic strata in eastern Zimbabwe. Households in subsistence farming areas were found to be bearing the brunt of the epidemic and were faced with deepening poverty.

Country: Zimbabwe.

Study area: Small towns, large-scale commercial farming estates and subsistence farming villages in Manicaland, Zimbabwe's eastern province.

Methodological approach: Interviews with primary caregivers of the deceased for deaths occurring between the 1998-2000 and 2001-2003 rounds of a stratified household census and cohort study.

Sample size: 133 male and 135 female adult deaths (final sample size expected to be approximately 320).

Control group: No.

Outcomes studied: Household income, expenditure on health care and funeral expenses, asset sales and relocation after adult death in household.

Key results: Results showed that most of the deceased (78 per cent) were the predominant income earners for their households. More men than women had been in formal sector employment; 60 per cent lost their jobs during their illness. The sick person and his/her spouse paid 42 per cent of health-care costs and 41 per cent was paid by other household members. One in seven caregivers gave up a job to care for the sick person, and about one in four households relocated within a few months of the adult death.

Mutangadura, G. (2000) Household welfare impacts of mortality of adult females in Zimbabwe: implications for policy and program development

Summary: The HIV/AIDS epidemic in Africa is increasingly becoming one of the major impediments to sustainable development. Zimbabwe is one of the southern African countries that is severely affected by the HIV/AIDS epidemic, which has already reversed hard-won gains on national health. At the global level, 46 per cent of the 33.6

million people currently living with HIV/AIDS are women. The trend in the proportion of females living with HIV/AIDS to the total adult population living with HIV/AIDS has increased in the past three years, according to the study. Since women are the gatekeepers of household food security and are key players in the overall household economy, it is important to find out the welfare impact of female mortality at the household level. In times of tightening national budgets and declining national resource allocation to social services, understanding how households respond to the death of an adult female is important. Such an understanding can help ensure that interventions aimed at assisting affected households and communities complement and strengthen people's own inventive solutions rather then substitute for or block them. The study describes the major household impacts of female mortality in Zimbabwe and identifies the household coping mechanisms adopted and the current formal and informal social support mechanisms. Findings indicate that the major household welfare impacts of adult female mortality were food insecurity, decrease in access to school, increased work burden on children and loss of assets. Empirical evidence from the research also indicates that elderly women have become the leading foster parents of surviving maternal orphans. The study also reveals that households are more dependent on informal sources of support to help cushion the impacts of premature adult female mortality. The report considers ways in which macroeconomic policies have aggravated conditions, resulting in the weakening of informal sources of support. The article suggests policy response options that can be used to strengthen the capacity of surviving households to cope with the impact of mortality of adult females. Such policy implications focus on intensification and expansion of national support to secondary education for orphans, support to the elderly and strengthening of community initiatives so as to generate substantial positive welfare effects by complementing the informal devices.

Country: Zimbabwe.

Study area: Manicaland province: one urban area (Mutare) and one rural area (Maranga).

Methodological approach: Household interview retrospective survey and focus group interviews.

Control or comparison group: No.

Sample size: 215 households fostering maternal orphans were interviewed.

Outcomes studied: Child schooling, health, food security and asset base.

Key results: About 40 per cent of the interviewed households had orphans who had lost both parents. Sixty-five per cent of the households where the deceased adult female lived before her death were reported to be no longer in existence in both the urban and rural sites. Most of the foster parents were grandparents (50 per cent in urban areas and 52 per cent in rural areas), and most grandparents were maternal grandparents (65 per cent). Of the total foster household heads, 62 per cent were women, with the proportion being higher in the urban site. Of the female-headed foster households, 60 per cent were headed by grandparents, 25 per cent by other relatives, 13 per cent by adult children and 2 per cent by children. In addition, 40 per cent of the female foster heads were aged 60 and above.

Nyamukapa, C., S. Gregson and M. Wambe (2003). Extended family childcare arrangements and orphan education in Eastern Zimbabwe

Summary: The study looked at arrangements for extended-family care of orphans and non-orphans in eastern Zimbabwe and their influence on primary school completion. The researchers found that, despite their being overrepresented in poor households, paternal orphans were no less likely to have completed primary school than non-orphans of the same age. However, fewer maternal orphans had completed primary school. The evidence suggested that extended family and external support was greater for widow-headed households than for widower-headed households, and that widowed mothers gave higher priority to their children's education than did widowed fathers. Extended-family care for orphans was

found to be under stress as the number of orphans continued to increase, and the results suggested that programmes to support extended-family care should be strengthened, especially in the rural communities where families typically bring up orphans.

Country: Zimbabwe.

Study area: Manicaland, eastern Zimbabwe.

Methodological approach: Statistical analysis of data on parental survival, household circumstances and school education from a socio-economic, location-stratified population census; systematic analysis of qualitative data on extended family-care arrangements and children's education from in-depth interviews with a purposive sample of children and caregivers, government and non-governmental organization representatives and community leaders.

Sample size: Statistical analysis done for population census of 14,372 children under the age of 15; in-depth interviews conducted with 48 pairs of children and caregivers stratified by gender and current orphan status.

Control group: Non-orphans were compared with three types of orphans (paternal, maternal and double orphans).

Outcomes studied: Family-care arrangements for orphans and non-orphans; primary-school completion rates for orphans and non-orphans.

Key results: The average age of all types of orphans was two to three years higher than non-orphans, and orphans were found disproportionately (relative to adult HIV prevalence) in rural business centres and subsistence farming areas. Children who had lost their mothers were less likely to have completed primary school than were non-orphans and children who had lost their fathers. Orphan-care arrangements vary considerably in Zimbabwe but still take as a common model an extended-family childcare system. However, this system is being eroded by socio-economic change and high HIV-related adult mortality.

Pitayanon, Sumalee, Sukontha Kongsin and Wattana S. Janjaroen (1997). The economic impact of HIV/AIDS mortality on households in Thailand

Summary: The main objective of the study was to measure and analyse the economic impact of adult HIV/AIDS-related deaths on rural Thai households in an area with a large number of reported HIV/AIDS cases. The study measured the size and significance of the economic impact of a death after all coping strategies had been employed. It investigated differences in impact between AIDS-related deaths and adult deaths from other causes, and it examined links between adult AIDS mortality and poverty. It also analysed the ability to cope with respect to the socio-economic characteristics of the household.

Country: Thailand.

Study area: Rural areas in five districts of Chiang Mai province in northern Thailand.

Methodological approach: Cross-sectional, retrospective data from a survey of rural households that experienced the death of a working adult; the methodology is similar to that employed in World Bank studies in Africa. Households were selected from hospital records of AIDS-related deaths during 1992 and 1993. Both the direct and indirect costs of an HIV/AIDS-related death were calculated.

Sample size: 116 households with a recent adult AIDS-related death; 100 households with a recent adult death not related to AIDS; and 108 households where no death had occurred.

Control or comparison group: Yes.

Outcomes studied: Socio-economic impact of adult HIV/AIDS-related deaths at the household level in rural Thailand; difference between AIDS death and non-AIDS death; links between adult AIDS mortality and poverty; coping ability of households with different socio-economic characteristics.

Key results: Rural households that experienced an AIDS-related death were mainly from the lowest

income and least-educated group, and most were engaged in agricultural work and labour. The impact of an AIDS-related death on the household was substantial and was greater than the impact of a death from other causes. Households coped with AIDS illness and death by spending savings, selling assets, reducing consumption, reallocating the time of household members to make up lost income, withdrawing children from school to help with chores and to work, borrowing money, receiving support from relatives and using services from non-family institutions. Most poor households received little help from non-family institutions. The burdens of AIDS-related deaths fall disproportionately on the poor and contribute to the increasing inequality of income distribution in Thailand. The evidence suggests that an adult AIDS death threatens a household's welfare and survival and that AIDS interventions must focus on the growing needs of the infected person's family and the community as a whole.

Rossi, M.M., and P. Reijer (1995). Prevalence of orphans and their education status in Nkwazi compound - Ndola

Summary: The study aimed at measuring the prevalence of orphans and their education status in Nkwazi compound, Ndola, in Zambia. It also assessed the attitude of the community towards orphans. The study showed that orphaned children had lower school attendance than non-orphans. The extended family system was also the only system that cared for orphans, and the majority of the carers found difficulties with the added responsibility; the major problems being lack of clothes, money for school fees and food.

Country: Zambia.

Study area: Nkwazi compound, in Ndola district.

Sample: 250 households.

Methodological approach: retrospective survey of 250 households selected among 10 sections in the community.

Outcome studied: school attendance, living arrangements.

Key results: Out of the 250 households surveyed, 81 (32 per cent) had orphans, and out of a population of 909 children, 192 (21 per cent) were orphans, of which 22 per cent were double orphans. Of the 149 single orphans, 24 per cent were maternal orphans and 76 per cent were paternal orphans.

Out of 140 orphans of school-going age, only 46 per cent were attending school as compared with 56 per cent of non-orphans.

Fifty-three (65 per cent) of the guardians of the orphans said that they had added responsibilities owing to the presence of an orphan in the family, with 27 per cent mentioning a lack of money as the problem, 22 per cent as having problems with school fees, 35 per cent mentioning food and 37 per cent mentioning clothes as their main problem.

Only 5 per cent of the 81 households with an orphan said that they received support from others in the community. Support came mostly from other relatives and the church.

Suliman, El Daw (2003). HIV/AIDS effects on AIDS orphans in Tanzania

Summary: The study produced new estimates of the number of AIDS orphans in the United Republic of Tanzania. About 921,000 children were estimated to be AIDS orphans as of 2000, or nearly 6 per cent of all children aged 0 to 15. The study also investigated the levels of child labour and child schooling and found significantly more orphans than non-orphans engaging in paid labour and significantly fewer orphans enrolled in school. Orphans were found to have school participation rates an average of 4 percentage points lower than those of non-orphans and rates of participation in paid labour an average of 9 percentage points higher. As orphans enter the labour force, they will be less well educated than non-orphans and are likely to be less productive. The large number of orphans will reduce the pool of qualified candidates for jobs in the Government and in the private sector.

Country: United Republic of Tanzania.

Study area: National samples.

Methodological approach: Modified life-table approach for estimates of AIDS orphans; logistic regression models on the effects of orphanhood on schooling participation.

Sample size: A total of 5,184 households in the United Republic of Tanzania (Mainland Tanzania and Zanzibar) from the Tanzania Human Resource Development Survey (HRDS); 8,327 households from the 1992 Tanzania Demographic and Health Survey; and 3,615 households from the 1999 Tanzania DHS.

Control group: Surveys of the general population; comparisons between orphans and other children.

Outcomes studied: Validation of estimates of the number of AIDS orphans in the United Republic of Tanzania; orphan versus non-orphan differences in child labour (work for pay, unpaid family work and help with household chores) and child schooling (enrolment rates and drop-out rates); and projections of the effect of orphanhood on future labour markets in the United Republic of Tanzania.

Key results: Single-parent orphans were twice as likely as non-orphans to have ever worked for pay, and dual orphans were more than ten times as likely to have worked for pay. Orphans were significantly less likely to attend school (orphanhood lowered the odds of attending school by 45 to 64 per cent) and were more likely to drop out as compared with non-orphans. Orphans were also more likely to work while attending school than non-orphans. The 1999 DHS data showed school attendance rates 5-10 percentage points lower for orphans than non-orphans and participation rates in paid work 5-10 percentage points higher for orphans.

Yamano, Takashi, and T.S. Jayne (2002). Measuring the impacts of prime-age adult death on rural households in Kenya

Summary: The study assessed the effect of prime-age adult mortality on rural household size and composition, agricultural production, asset levels and off-farm income. Mortality was calculated by using adult mortality rates from an HIV-negative sample from the neighbouring United Republic of Tanzania to predict the number of deaths that might have been expected in Kenya in the absence of HIV. The results indicated that AIDS accounted for a large proportion of the recorded deaths of males and females in the prime ages, particularly in the Nyanza region. Households with an adult death were compared with those that had no adult death. The effects were found to be highly sensitive to the gender and position of the deceased family member, with the most serious effects found when the male head of household died. Crop production declined, particularly such cash crops as coffee, tea and sugar, and off-farm income was significantly affected by the death of the male head. There was little indication that households were able to recover quickly from the effects of the adult death.

Country: Kenya.

Study area: 22 districts in the eight agriculturally oriented provinces.

Methodological approach: Household surveys in 1997 and 2000 using a two-year panel; household fixed-effects model that controls for time-varying effects to measure changes in outcomes between households with an adult death and those without an adult death during the three-year survey period.

Sample size: 1,422 households.

Control group: Surveys of the general population; comparison of households experiencing an adult death to other households.

Outcomes studied: Effect of prime-age adult mortality on size and composition of rural households, agricultural production, asset levels and off-farm income.

Key results: The death of the head of household or spouse resulted in a reduction of household size greater than one person; the death of a male household head aged 16 to 59 was associated with a 68 per cent reduction in the value of the household's crop production; off-farm income was significantly affected by the death of the male head

of household but not by the death of other adult members; households did not recover quickly from prime-age head-of-household adult mortality.

B. STUDIES ON FIRMS

Aventin, Laurent, and Pierre Huard (1997). HIV/AIDS and business in Africa: a socio-medical response to the economic impact? The case of Côte d'Ivoire

Summary: Using the findings from research carried out from 1995 to 1996 on the economic impact of HIV/AIDS on three firms in Abidjan, the researchers looked into the companies' reactions to the dysfunction caused by the epidemic. Two categories of costs were identified: the observable and quantifiable costs (absenteeism for health reasons, the costs of medical care and falling productivity); and the less quantifiable effects of HIV/AIDS, such as the increasing disorganization of work.

The study was based on cases of HIV infection reported by each establishment's resident physician. The method thus excluded cases of seropositivity among staff members not known to the company doctors. The research varied from one firm to another owing to the nature and quality of the information available for a retrospective study. The study involved repeated interviews with company doctors, chief executives, personnel managers, chief accounting officers, other managerial and supervisory staff and workers. Other information from outside the three firms was obtained from members of associations for HIV-infected persons, trade unions and insurance companies.

Country: Côte d'Ivoire.

Study area: Three firms in the city of Abidjan.

Methodological approach: Repeated interviews with company personnel and workers. The study is based on cases of seropositive employees whose infection was reported by each establishment physician.

Outcomes studied: Costs of medical care and falling productivity.

Key results: Over the period for which records were reviewed, which ranged from 1989-1995 to 1993-1995 in the three firms, employees known to be infected with HIV made up between 1 and 3 per cent of the firms' average number of employees. Between 57 and 80 per cent of the HIV-infected employees had already died. Quantifiable monetary costs to the firms depended heavily on the health and death benefits offered by the employer. The highest direct costs were incurred during the employees' morbidity phase.

Baggaley, R., Peter Godfrey-Faussett, Roland Msiska, Diane Chilangwa, Eusabio Chitu, John Porter and Michael Kelly (1994). Impact of HIV infection on Zambian businesses

Summary: In the study, the personnel managers of 21 companies with a total workforce of 6,447 people in Lusaka and in towns in the Copperbelt were visited by the study team. A questionnaire on mortality, productivity and recruitment in the 21 companies was completed by the managers for the period from 1987 to 1992, using company records. All 21 questionnaires were returned. HIV was felt to have affected productivity in 48 per cent of the companies and recruitment in 19 per cent. Some 14 per cent of the companies knew of employees who were infected with HIV. The crude death rate increased from 0.24 per cent in 1987 to 1.6 per cent in 1992 and was predicted to be 2.1 per cent in 1993.

Most deaths were due to unknown causes, though deaths from tuberculosis, diarrhoea and AIDS were recorded with increasing frequency.

Country: Zambia.

Study area: Lusaka and towns in Copperbelt.

Methodological approach: A questionnaire on mortality, productivity and recruitment in the 21 companies was completed by managers for the period from 1987 to 1992, using company records.

Outcomes studied: Death rate.

Key results: The crude death rate among employees increased from 0.24 per cent in 1987 to 1.6 per cent in 1992 and was predicted at 2.1 per cent in 1993.

Bersufekad A. (1994). A study on the socio-economic impact of HIV/AIDS on the industrial labour force in Ethiopia

Summary: In the study, conducted in Ethiopia, 15 different establishments were surveyed. Data on the incidence of HIV/AIDS among the employees of those establishments were collected over the five-year period 1989-1993 from the clinics owned by the establishments. Data were also collected on the occupations of employees and the types of firms. Data on absenteeism and medical costs were collected. It was found that 53 per cent of all illnesses accounted for were HIV/AIDS-related. Although there was a possibility of a selection bias since not all infected employees were known by the companies (some may have chosen to go to private clinics to ensure the confidentiality of their status), the study showed that HIV/AIDS-related illnesses were on the rise.

Country: Ethiopia.

Methodological approach: Firms were surveyed from 1989 to 1993 and data on HIV incidence among employees were collected along with data on absenteeism and medical costs to the firms.

Key results: It was found that 53 per cent of all illnesses accounted for were HIV/AIDS-related. That may be an underestimate, since not all infected employees were known to the companies.

Clancy, P. (1998). The economic impact of AIDS at firm level in Tanzania

Summary: The study measured the medical costs paid by six firms in the United Republic of Tanzania from 1993 to 1997, based on company records. Although the cause of illnesses is not known in most of the cases, the study showed that medical costs increased 3.5 to 5 times between 1993 and 1997 in the six firms.

Country: United Republic of Tanzania.

Study area: Six firms.

Methodological approach: Collection of information on medical costs at the firm level.

Outcomes studied: Medical costs.

Key results: The study showed that medical costs increased 3.5 to 5 times between 1993 and 1997.

Forgy, L. (1993). The economic impact of AIDS in Zimbabwe

Summary: Using simple economic simulation models with and without AIDS, the study predicted the impact of AIDS on the mining industry in Zimbabwe and showed that the costs resulting from AIDS would increase 12 times from 1995 to 2010. Assumptions were made on the prevalence of HIV in the mining industry and on how it affected the industry. The same study was replicated for Zambia as well. The goal of the study was to predict the impact of HIV/AIDS on the economy at large. The model incorporates demographic, health and human capital variables.

Country: Zimbabwe.

Study area: Mining industry.

Methodological approach: Simple simulation models incorporating demographic, health and human capital variables.

Outcomes studied: Costs of AIDS.

Key results: Prediction of a 12-fold increase of the costs of AIDS to the mining industry between 1995 and 2010.

Fox, Matthew, Sydney Rosen, William MacLeod, Monique Wasunna, Margaret Bii, Ginamarie Foglia and Jonathon Simon (2003). The impact of HIV/AIDS on labour productivity in Kenya

Summary: The impact of HIV/AIDS on individual labour productivity during the progression of the

disease is not well known. The study examined the productivity and attendance at work of 54 tea-estate workers who died of AIDS-related causes between 1997 and 2002 in western Kenya. The results showed that productivity declined as AIDS progressed, especially in the last year before death. The empirical estimates of the impact of HIV/AIDS were probably understated, since workers often brought unrecorded "helpers" to assist them and prevent them from losing their jobs.

Country: Kenya.

Study area: Kericho district, Rift Valley province.

Methodological approach: The researchers used a retrospective cohort design. They collected data from company hospital records and records of daily productivity, including daily output in kilograms of tea leaves plucked, use of paid and unpaid leave and assignment to less strenuous tasks by workers who died of AIDS over a 36-month period. They then compared the data with a control group of workers still in the workforce, matching them on time and tea field.

Sample size: 54 tea-estate workers who died of AIDS-related causes.

Control group: Yes; workers still in the workforce.

Outcomes studied: Labour productivity of HIV/AIDS-affected workers in a tea estate as measured by kilograms of tea leaves plucked per day, amount of leave (sick leave, annual leave and unpaid leave) used and days spent doing less strenuous tasks; changes in productivity as the disease progressed.

Key results: HIV-positive workers plucked significantly less tea than those in the control group. In their last two years of life, workers who ultimately died of AIDS produced roughly one-third less tea than other pluckers. Their earnings declined by more than 18 per cent during their last year of life. They also used significantly more leave in the three years preceding death. The quantity of tea plucked declined and the use of leave time increased as they became closer to death. They also spent more days than control workers performing less strenuous tasks. HIVAIDS-related morbidity affected worker performance for at least three years before death.

Ntirunda, M., and Y. Zimda (1998). The impact of HIV/AIDS on production: the experience with Lonhro companies, Malawi

Summary: The study was conducted in Lonhro companies in Malawi in 1991/1992 and 1995/1996. Information was collected on deaths in service during the two periods and the amount of money paid as death-in-service benefits during the two periods. The study showed that deaths in service increased from 1.3 per cent of the pension members to 1.9 per cent from 1991/1992 to 1995/1996, an increase of 40 per cent in a five-year period.

Country: Malawi.

Study area: Lonhro companies.

Methodological approach: Information collected on deaths in service during the two periods and the amount of money paid by the companies as death-in-service benefits.

Outcome studied: Mortality rate and money paid.

Key results: Deaths in service increased from 1.3 per cent in 1991/1992 to 1.9 per cent in 1995/1996. The amount of benefits paid for deaths in service also increased between the two periods.

Rosen, Sydney, Jeffrey R. Vincent, William MacLeod, Matthew Fox, Donald Thea and Jonathon Simon (2003). The cost of HIV/AIDS to businesses in Africa

Summary: In the high-prevalence countries of sub-Saharan Africa, HIV/AIDS has the potential to raise the cost of labour at the same time that it reduces the number of consumers and impoverishes households. It is thus limiting the profitability of businesses and diminishing their competitiveness in the global marketplace. Information about the potential costs of AIDS to the private sector is essential for determining whether companies have a financial incentive to invest in pre-

vention and treatment interventions. The study used detailed data from six companies to estimate the cost of AIDS to businesses and the benefits of prevention and treatment. The analysis found that such interventions would be profitable for all companies and all job levels. Anti-retroviral therapy would be profitable for most companies and job levels if it could be provided for $400 per patient per year.

Countries: Botswana and South Africa.

Methodological approach: Financial, medical and human resource data were collected from six large enterprises from 1999 to 2001. Information was obtained on sick leave; productivity loss; supervisory time; retirement, death, disability and medical benefits; and recruitment and training of replacement workers. Data were also collected from interviews with managers, examination of company documents and a questionnaire administered to supervisors. Results of voluntary, anonymous and unlinked seroprevalence surveys of the workforce were used to stratify the workforce into relatively homogeneous HIV prevalence subgroups on the basis of job level, age range, sex and legally defined racial group. Regression analysis was used to explore the relationship between AIDS victims and use of sick leave and medical facilities.

Sample size: Six formal-sector companies, selected to represent diverse sizes, locations and industrial sectors, including mining, agribusiness and retail.

Control group: No.

Outcomes studied: The study examined the costs of HIV/AIDS associated with individuals: productivity losses from increased sick leave and poor performance on the job, payouts for medical and end-of-service benefits and costs of recruiting and training replacement workers. The present value of incident HIV infections with a nine-year median survival time and real discount rate of 7 per cent was calculated.

Key results: HIV prevalence in the workforces studied ranged from 7.9 per cent to 25 per cent. Costs varied widely across firms and among job levels within firms. The "AIDS tax" varied from less than 1 per cent to 6 per cent of labour costs per year for the companies studied, under a conservative set of assumptions. Investment in prevention and treatment can reduce the tax for most companies and most levels of the workforce and represents a missed profit opportunity for the private sector.

Smith, J., and A. Whiteside (1995). The socio-economic impact of HIV/AIDS on Zambian businesses

Summary: The study was conducted based on data on the number of employees and the number of deaths in Barclays Bank from 1987 to 1992. The average annual death rate of employees was calculated for those years. Information on benefits provided to families of deceased bank employees was also collected for those years, which permitted the calculation of death rates as well as costs of benefits provided to family members.

Problems in estimating the existence of AIDS within the bank were observed. However, there was evidence of an increase in deaths among the employees: 1,155 from 1987 to 1992 (without medical confirmation). Among the causes of death recorded were tuberculosis, pneumonia and unknown. Despite the lack of accurate information on HIV/AIDS cases, assumptions were made based on certain facts and consistencies, which tended to confirm the general view that HIV/AIDS-related cases existed in the bank. Furthermore, statistics showed a concentration of staff deaths in the younger age groups (86 per cent were below the age of 46 years). The impact of AIDS on the bank was calculated based on the expenditures on deceased staff.

Country: Zambia.

Study area: Barclays Bank.

Outcomes studied: Medical expenditures and benefits to families of deceased workers.

Key results: There was an increase in the number of deaths from 1987 to 1992, confirming the impact of AIDS on costs for the bank.

C. STUDIES ON AGRICULTURE

NOTE: In addition to the studies presented below, some of those covered in parts X.A and X.B also concern rural livelihoods.

Barnett, T. (1994). The effects of HIV/AIDS on farming systems and rural livelihoods in Uganda, Tanzania and Zambia

Summary: The study, which was commissioned by the Food and Agriculture Organization, tries to understand the actual and potential impacts of HIV/AIDS on farming systems, especially the estate sector in Zambia. Fieldwork was carried out in 1993, using various participatory methods. The emphasis of the research was on identifying different levels of vulnerability, which is a function of the farming type and the extent of the epidemic. A vulnerability map was produced for Zambia. With vulnerability analysis, the production of an early warning system is possible using three information sources:

- A national broad classification to produce a vulnerability map
- Detailed information from district-level agricultural and administrative sources
- The nature of the impact in specific communities using rapid rural assessment techniques

In Zambia it appears that the most labour-vulnerable farming systems were not immediately vulnerable to the epidemic. In addition, the impact varied widely, making generalization difficult. Matrilineal societies were more vulnerable to labour loss than patrilineal societies. At the time of the study, the impact of AIDS in the Zambian estate sector was limited and was greatest among skilled and educated members of the workforce. An important finding was that the loss of male household members was significant for the management of household economies and the marketing of agricultural produce.

Types of programme activities in relation to agriculture included the following:

- Improvement of returns to labour, as, for example, the use of better storage techniques
- Extension of the planting period
- Crop diversification and reduction of external input requirements
- Cattle and livestock loans, especially for women
- Microcredit schemes

Twenty-seven specific projects were outlined, including pest control, encouragement of better marketing techniques, formation of women's groups, training of orphans in agricultural techniques and crop diversification for income generation.

In intervention programme design, the temporal aspects of the disease and its impact should be considered. HIV/AIDS has three stages: pre-impact, early impact and full impact, as explained below:

- Pre-impact. In this stage, the emphasis should be on (a) health and behavioural education to impede the development of the epidemic, and (b) inclusion in extension messages of clear HIV/AIDS-impact material indicating the types of effects that the epidemic may have on people's livelihoods.

- Early impact. The emphasis should be on health and behavioural education; the development of and support for community-based diagnosis of the current impact; the development and strengthening of existing community support mechanisms; and the development, in consultation with the community, of livelihood and farming adaptations that facilitate labour-economizing activities, technologies and techniques.

- Future impact. In addition to the steps mentioned above, it will be necessary to focus on the development of support

groups for the survivors and ensure that relief assistance is available where necessary.

Countries: Uganda, United Republic of Tanzania and Zambia.

Study area: Estate sector.

Methodological approach: Rapid rural appraisal techniques involving the use of qualitative and quantitative data.

Control group: No.

Sample size: Not applicable.

Outcomes studied: Impact of loss of male household members on household economies.

Key results: At the time of the study, the impact of AIDS in the Zambian estate sector was limited, concentrated mainly on the supply of skilled and educated members of the workforce. An important finding was that the loss of male household members was significant for the management of household economies and the marketing of agricultural produce.

Baylies, C. (1996). Fertility choices in the context of AIDS-induced burdens on households and environment

Summary: Based on fieldwork in agricultural households in Eastern and Lusaka provinces in Zambia the study found that AIDS-affected households tended to concentrate on maize production at the expense of non-staple foods once labour loss was a factor. In addition, livestock and other assets would be sold and the area under cultivation would be reduced. In the field areas, 16-20 per cent of households reported an AIDS death, and the effect of the disease was exacerbated more by the long periods of morbidity of the patient than by the cumulative impact of deaths and changes in household composition. The author noted a tendency to underestimate the impact of AIDS on agriculture in rural communities.

Country: Zambia.

Study area: Eastern and Lusaka provinces.

Methodological approach: Rapid rural appraisal techniques involving the use of qualitative and quantitative data.

Sample: Not applicable.

Control group: No.

Sample size. Not applicable.

Outcomes studied: Maize production and labour loss.

Key results: Shift from non-staple foods to maize production.

Drinkwater, M. (1993). The effects of HIV/AIDS on agricultural production systems in Zambia

Summary: The study included an analysis and field reports of case studies carried out in Mpongwe, Ndola rural district, and Teta, Serenje district. The objectives of the study were, among others:

- To investigate the effect of current health trends, including HIV/AIDS, on agricultural productivity and food security
- To explore how current income-generating activities were being affected by loss of labour in households and how households were adapting (coping strategies)
- To find out how household labour was being affected
- To identify especially vulnerable groups and the impact of labour loss on these groups
- To find out about the people's understanding of health issues and their impact
- To see how existing coping strategies could be strengthened and new ones initiated to support in particular the most vulnerable groups being affected by health problems

- To see how HIV/AIDS prevention and care programmes in the community could be carried out and strengthened

It is common among the matrilineal people who are prevalent across many parts of rural Zambia for an event such as the death of a parent or a divorce to lead to the break-up of the nuclear family itself. Death, like divorce, causes social dislocation. Women move with their children back to the villages of their own mothers or other matrilineal kin, leading those villages to have an increasing number of single-parent producers and a growing dependency ratio.

Country: Zambia.

Study area: Two rural areas; Ndola rural district and Serenje rural district.

Methodological approach: Rapid rural appraisal techniques, involving the collection of qualitative and quantitative data by a multidisciplinary research team.

Both the Mpongwe and Teta surveys began with introductory meetings with farmers, followed by two to three days of detailed interviews, which, once analysed, were built upon through a few follow-up interviews and then final meetings. In both studies, farmers were divided into different groups by gender for the final meeting.

Sample: Not applicable.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: Food security.

Key results: The study found that in Zambia up to 1993, HIV/AIDS was a largely urban phenomenon: at the beginning of the 1990s, 45 per cent of the recorded cases were within the Copperbelt urban centres alone. The pathways of the spread of infection from the main urban centres were the major transport routes, and the carriers were those who used the route regularly—traders, truck drivers and business people. Where those carriers interacted with people from rural areas—for instance, with women marketing crops—HIV/AIDS infection spread into the rural areas. Nodal points could be identified where contact between carriers and rural dwellers was most intense and thus where rural infection rates rose first. The Chipese area, just west of Mpongwe Mission Hospital, was a nodal point of this nature. Chipese was identified specifically as a case study area in the Mpongwe area by AIDS programme staff at Mpongwe Mission Hospital since the area had a high concentration of home-based care patients attended by the hospital—8 patients out of a total of 74.

Haslwimmer, M. (1994). The social and economic impact of HIV/AIDS on Nakambala sugar estate

Summary: A case study of Nakambala sugar estate in Mazabuka district revealed that the impact of AIDS was so far restricted. Even though the man-hours lost from tuberculosis and AIDS accounted for 50 per cent of the total hours lost to illness in the most recent year studied (1992), the cost of absences from tuberculosis and AIDS amounted to only 2 per cent of total labour costs. It was suspected that 75 per cent of the deaths on the estate during the period 1992-93 were AIDS-related. However, in 1992-1993, the sale of sugar reached its peak since the founding of Nakambala, implying that AIDS had up to that point not had a serious impact on production. In fact, the apparent impact of AIDS was mitigated, and the perception of many involved in the sector was that other pressures on production, such as drought and morbidity caused by malaria and diarrhea, were far greater problems than HIV/AIDS.

Country: Zambia.

Study area: Nakambala sugar estate.

Methodological approach: Case study.

Sample: Not applicable.

Control group: No.

Sample size: Not applicable.

Outcomes studied: Man-hours lost.

Key results: The study found that the impact of AIDS was limited up to 1994. Those involved thought that pressures on production were caused by other factors.

Haslwimmer, M. (1994). Is HIV/AIDS a threat to livestock production? The example of Rakai, Uganda

Summary: The study found that one of the serious effects of HIV/AIDS on the farm household was the loss of labour. According to the author, rapid population growth has long been considered one of the greatest problems in Africa. In some rural communities, however, HIV/AIDS is now causing labour shortages for both farm and domestic work. In addition to the loss of labour of the AIDS patient through sickness and subsequent death, family members have to set aside time to care for the sick and, in the end, neglect their farm or off-farm activities, with the subsequent loss of potential income. The situation is aggravated in farming systems with labour peaks during certain times of the year and by a marked gender division of labour, which means that with the death of the husband or wife the spouse does not necessarily take over the work of the deceased. Labour-intensive farming systems with a low level of mechanization and agricultural input are also particularly vulnerable to the impact of HIV/AIDS. In addition, traditional customs, such as the time of mourning, which can last as long as 40 days, depending on the importance of the dead family member and during which no farming activities can be carried out, can adversely affect labour availability.

Country: Uganda.

Study area: Rakai district.

Methodological approach: Rapid rural appraisal techniques.

Sample: Not stated.

Outcomes studied: Changes in ownership of livestock.

Key results: Farmers reported that 10 years ago they had more livestock than today, when about 70 per cent of all households had cattle. The livestock decline is in line with the findings of the land utilization survey conducted in Rakai and Masaka in 1991.

Morris, C., Burdge, D.R. and Cheevers, E.J. (2000). Economic impact of HIV infection in a cohort of male sugar mill workers in South Africa

*Summar*y: The study was undertaken to assess the economic impact of HIV infection in a cohort of rural agricultural workers in South Africa from the perspective of industry. It also projected the medium-term economic impact in that setting based on the known HIV prevalence for the cohort. The study population was 406 rural sugar mill workers, 96 per cent of whom were male. Workers attended an occupational clinic that was provided to them free of charge. They were not prohibited from seeking care at other clinics or privately but had an incentive to utilize the company clinic as it was free of charge and of good quality. All HIV-positive employees who had undergone voluntary testing during the period 1991-1998 were identified. The group included those tested as part of two voluntary sero-surveys undertaken in 1991 and 1996 and those tested on presentation to the clinic with a related illness. In all cases pre-test and post-test counselling was undertaken on site at the clinic. The prevalence data were collected from a saliva-based screen of the whole workforce in January 1999. Ethics approval was obtained from the University of Natal, Durban.

Data were collected from clinic, hospital, insurance and employment records. In the clinic, each visit was documented by a nurse practitioner or physician with a physical exam and diagnosis for each episode. CD4 testing was not routinely done and no prophylaxis for opportunistic infection or anti-retroviral treatment was given during the study period. Hospital records reviewed were those that were part of the workers' clinic chart.

Employment records reviewed were kept at a central site for all employees and included pay grade, age, sex and place of residence. Insurance records were examined for all workers who took ill-health retirement during the time period of the study. From the records, data were extracted on absence from work, hospital stays and clinic visits. Data on the same variables were extracted from a control group of 100 workers not known to be HIV-infected. A saliva-based assay was used to obtain prevalence data on the workforce population. The saliva collection was done on site by a laboratory technician under the supervision of the project manager. The clinical HIV-testing policy of the mill has been one of strict confidentiality between the caregivers and the mill employees. Records do not identify HIV-positive workers, and management at the mill has no mechanism to obtain that information. No HIV testing is done prior to employment, and no prejudicial action may be taken if an employee reveals his status.

In order to determine the costs of illness in the workplace, retrospective data obtained on morbidity and mortality were analysed. Current wage levels and replacement worker costs were determined from payroll databases. Productivity losses from HIV were formulated using industry human-resource estimates. Training costs were estimated from industry standards and human-resource estimates. Hospitalization costs were determined from a review of workplace-based records of payment for workers admitted or workers reimbursed for hospital care. Payment of medical providers was determined from fee-service schedules in the occupational health clinic. A model was formulated projecting prevalence data obtained in the population over a six-year period of disease progression and an incident infection rate of 2 per cent. The natural history of the disease was taken from published reports in Africa. The distribution of clinical disease was determined by clinical information and CD4 counts on a sample of known HIV-infected workers in the study population. Those workers were taken as starting points for disease progression. The cost data were obtained retrospectively and applied to future workforce morbidity and mortality based on the epidemiological data collected. All numbers were calculated in South African rand at 1999 values.

Country: South Africa.

Study area: One rural area sugar mill.

Methodological approach: Use of data collected from clinic, hospital and employment records and a household interview survey.

Sample: Individuals who were HIV-positive.

Control group: Yes.

Sample size: 406 sugar mill workers, of whom 97 were HIV-positive.

Outcomes studied: Costs of illness in workplace, medical expenses, training costs.

Key results: A total of 97 mill workers were seropositive for HIV from 1991 to 1998. Of those, 56 were still in the workforce at the end of December 1998. The HIV-infected workers were exclusively male and had a mean age of 40.6 years and a median age of 40.5 years (range 25-73). A total of 90 per cent of the workers were married and 23 per cent had more than one marriage partner, with an average of 1.36 and median of 1.0. The mean number of dependents per worker was 6.36 with a median of 6.0 (range 1-18). Most workers (60.5 per cent) lived in hostel accommodation on site; the rest lived in the surrounding community. HIV-infected members lost an average of 55 days of work from the illness during their last two years of employment, incurring economic costs of nearly 8,500 rand per worker. Costs to the industry were projected to increase tenfold in the next 6 years.

Rugalema, G. (1999). HIV/AIDS and the commercial agricultural sector of Kenya: impact, vulnerability, susceptibility and coping strategies

Summary: The findings of the study show that the commercial agricultural sector of Kenya is facing a severe social and economic crisis as a result of the impact of HIV and AIDS. Protracted morbidity and mortality have profound financial, economic and social costs for industry. The loss of skilled and experienced labour to the epidemic continues to be a serious concern. If agro-estates

are to remain viable businesses, according to the author, it will be necessary to approach the epidemic with the seriousness it deserves. Measures include well-elaborated prevention programmes and concerted mitigation strategies at the company level in collaboration with other sectors of the economy, including the Government, non-government organizations and civil society.

The findings confirm that the effects of HIV/AIDS on agriculture in Kenya and on the economy as a whole are alarming. The epidemic has severely hit the Kenyan workforce in its prime. Many of the victims are in their 20s and 30s, their most productive years, when they develop AIDS symptoms and begin to fall ill. The severe losses are affecting an entire generation. Beyond the human tragedy, the situation results in steadily rising costs to companies. The companies also suffer sharp decreases in profits, or losses, as a result of the loss of workers and decreased working hours caused by illness, death, overwork and stress, attendance at funerals and home care of ill dependents.

Country: Kenya.

Study area: Five commercial agro-estates in three provinces: Nyanza, Rift Valley and Eastern provinces.

Methodological approach: Review of medical expenses incurred by the estates and survey of households with AIDS patients.

Sample: Five commercial agro-estates.

Control group: No.

Outcomes studied: Absenteeism, labour time lost, medical expenses, funeral expenses.

Key results: Increase of absenteeism, increase in medical costs incurred by the agro-estates as well as in those incurred by individual households.

Shapouri, S., and S. Rosen (2001). Toll on agriculture from HIV/AIDS in sub-Saharan Africa

Summary: The study projects the production of crops in the most affected countries in sub-Saharan Africa and shows a slow growth in agriculture productivity and the overall economy, resulting in growing food insecurity over the last two decades. Even in countries like Uganda where, owing to the decline of HIV prevalence, food supplies are projected to be nutritionally adequate, food insecurity remains a major concern as a result of low incomes and a skewed income distribution. The projections assume that, by reducing the number of farm laborers, the AIDS epidemic could significantly diminish the region's food security. The projections also assume that the marginal productivity of labour remains constant over the projection period.

Countries: Kenya, Malawi, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: National rural population.

Methodological approach: Projections of grain market performance and nutritional vulnerability.

Sample: Not applicable.

Control or comparison group: Not applicable.

Sample size: Not stated.

Outcomes studied: Crop production.

Key results: Decrease in crop production and increase in crop imports.

Topouzis, D. (1998). The implications of HIV/AIDS for rural development policy and programming: focus on sub-Saharan Africa

Summary: The paper examines the implications of the HIV epidemic for rural development policies

and programmes in sub-Saharan Africa and, in particular, the interrelationships between rural development and HIV/AIDS and the broad policy and programming challenges that the epidemic poses for rural institutions. A conceptual framework for the identification of key policy and programming issues for rural development raised by HIV is proposed in the study. It is intended to provide guidance for the design and conduct of a set of four case studies to be carried out in Southern and Eastern Africa. The main objective of the case studies will be to help formal and informal rural institutions generate policy and programme responses to the HIV epidemic (in such areas as land tenure, agricultural research, training and extension, appropriate technology and credit) in each of the four countries.

Countries: Botswana, Kenya, Malawi, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: Rural areas of the selected countries.

Methodological approach: Development of a conceptual framework for the identification of the main policy and programming issues for rural development raised by the HIV epidemic.

Outcomes studied: Not applicable.

Key results: A conceptual framework for the identification of rural development policy and programme issues is proposed.

D. STUDIES ON EDUCATION

NOTE: Some of the studies reviewed in section X.A concern school enrolment.

Badcock-Walters, Peter, Christopher Desmond, Wendy Heard and Daniel Wilson (2003). Educator mortality in-service in KwaZulu Natal: a consolidated study of HIV/AIDS impact and trends

Summary: KwaZulu Natal has the largest provincial education system in South Africa, with 2.7 million learners and 75,000 educators in nearly 6,000 schools. With an antenatal HIV prevalence rate of about 35 per cent, it is also the province in South Africa most affected by HIV/AIDS. The present study reviewed all available data and attempted to establish a basis for estimating future demand for teachers. Data analysis confirmed that mortality among educators of both genders rose significantly from 1995 to 2001, especially among those aged 25 to 40. The overwhelming cause of death among both sexes under 45 was illness/natural causes.

Country: South Africa.

Study area: KwaZulu Natal province.

Methodological approach: Analysis of annual school survey data; a random sample survey of 100 schools to investigate reporting of educator mortality; analysis of educator mortality records, including pension and medical records.

Sample size: 100 schools, sampled randomly, in addition to provincial data on schools and pensions.

Control group: No.

Outcomes studied: Mortality rates of educators over a five-year period; cause of death of educators.

Key results: Mortality among educators of both genders rose significantly over the five years between 1997 and 2001, from 406 in 1997 to 681 in 2000 and 609 in 2001. A by-product of the 100-school random sample survey was an analysis of the quality and dependability of school record-keeping. Data were not available for many educators who took early retirement.

Bennel, P., and others (2002). The impact of the HIV/AIDS epidemic on the education sector in sub-Saharan Africa: a synthesis of the findings and recommendations of three country studies

Summary: The report presents the main findings and recommendations of an international research project, which has focused on assessing the impact of the HIV/AIDS epidemic on primary and secondary schooling in three countries: Botswana,

Malawi and Uganda. Adult HIV prevalence rates were estimated to be 36 per cent in Botswana, 21 per cent in Malawi and 8 per cent in Uganda in 1999. The report explores prevention for students and the impacts on students and teachers.

Countries: Botswana, Malawi and Uganda.

Sample size: A total of 41 schools in the three countries were surveyed.

Methodological approach: A range of qualitative and quantitative methods was employed. Extensive interviews of education managers and teachers were conducted. Representatives of ministries, non-governmental organizations and donor organizations were also interviewed.

Key results: The study found that in Botswana, absenteeism rates were relatively low and, in primary schools, that orphans had better attendance records than non-orphans. Strong school culture may explain the very low dropout rates in both primary and secondary schools. The Government has also introduced a comprehensive programme of material support for disadvantaged orphans. On the other hand, in Malawi and Uganda, absenteeism was very high among all primary school children. The principal causes were mainly poverty-related. While student absenteeism tended to be higher among orphans than non-orphans, the differences were much lower than expected. Illness in the family was not a major reason for absence, except for maternal and double orphans in Uganda. Generally the poorest orphans had the most problems at school.

Burkina Faso. National Committee to Combat HIV/AIDS and Sexually Transmitted Infections (2003). The impact of HIV/AIDS on the social sectors: the case of health care and education

Summary: HIV/AIDS has taken on such significant dimensions in Burkina Faso that it has had major economic and social repercussions. The study is a preliminary attempt to provide guidelines for the closer analyses and further assessments required to improve the general understanding of the impact of HIV/AIDS. It summarizes and evaluates the main impact studies and offers a conceptual framework for understanding the impacts, especially on the education and health sectors. It recommends areas for studies that would provide a better understanding of the impact of HIV/AIDS on households and the various social sectors.

Country: Burkina Faso.

Study area: Education and health sectors.

Methodological approach: Literature review. Analyses were carried out using data available from the health and education sectors and assuming different scenarios about HIV/AIDS prevalence rates. Results of qualitative studies were also considered.

Sample size: Not applicable.

Control group: Not applicable.

Outcomes studied: Impact of HIV/AIDS on demand for and cost of health care; impact on quality of health care; impact on children who lost parents to HIV/AIDS; impact on quantity and quality of educational services and on demand for education.

Key results: HIV/AIDS has already had major impacts on social sectors. In the health sector, 30 to 50 per cent of the hospital beds in Burkina Faso are monopolized by patients living with HIV/AIDS, and the increase in the demand for care was projected at 30 per cent by UNDP in 2000. The increase in resources allocated to HIV/AIDS treatment has resulted in fewer resources available to combat other scourges, such as malaria, malnutrition and tuberculosis. Fear of contracting the HIV virus on the part of health workers has led to a decline in the quality of care. In the education sector, the national goal of universal primary education has stagnated at about 30 per cent of eligible children. Girls constitute only about one third of the student population. Orphans are 50 per cent less likely to receive an education if a parent has died of AIDS and 90 per cent less likely if both parents died of the disease.

Goveia, Jeffrey Joseph (1999). Education and the epidemic: the effects of HIV/AIDS on basic education in Namibia

Summary: The report considers the effects that HIV/AIDS will have on the national education system in Namibia. It also considers the factors that have helped and continue to help the spread of the disease throughout Namibia and throughout Africa. It explores the effects AIDS will have on children and on student enrolments in the Namibian education system. It also considers the effects AIDS will have on the supply of and demand for teachers. Finally, it provides recommendations for addressing the AIDS crisis to leaders of all sectors of Namibian society, national and international aid organizations and education policymakers.

Country: Namibia.

Study area: National.

Methodological approach: Modelling was used to forecast the school-age population and the number of teachers. Data from 1992 to 1998 from the Ministry of Basic Education, Sport and Culture were also used. Projections with and without AIDS were carried out.

Key results: The national education system of Namibia is losing teachers, administrators and students at all levels as a result of AIDS. In 1998, 12,888 students were enrolled in grade 12 throughout Namibia. If Namibia has to produce nearly 2,000 teachers a year, almost one of every six secondary school graduates will need to complete teacher training college and enter the teaching corps to keep pace with the demand.

Kelly, M.J. (2000). The encounter between HIV/AIDS and education

Summary: In the paper the author has conceptualized HIV/AIDS as having the potential to affect education through ten different mechanisms: reduction in demand, reduction in supply, reduction in availability of resources, adjustments in response to the special needs of a rapidly increasing number of orphans, adaptation to new interactions both within schools and between schools and communities, curriculum modification, altered roles that have to be adopted by teachers and the education system, the ways in which schools and the education system are organized, the planning and management of the system, and donor support for education. Nevertheless, in the face of the epidemic, education can generate hope owing to its potential to work at different levels where AIDS-related interventions are needed.

Country: Zambia.

Study area: National.

Methodological approach: Estimation and projection of the school-age population, literature review.

Key results: The study found that HIV/AIDS is affecting pupils, teachers and the curriculum content in Zambia. It is also affecting the organization, management and planning of education and resources for education. It is slowly leading to questions about the very nature, purpose and provision of education. Many of the potential impacts that are outlined are already destroying the system. It is only when civil and public society come to grips with the potential and actual extent of those HIV/AIDS impacts that appropriate actions will be taken to respond to, and possibly even control, the situation.

A study conducted in two high-density areas in Lusaka found that of 1,359 children aged 18 and below, two thirds (67 per cent) had lost one or both parents. Seven per cent of them dropped out of school in the twelve months prior to the study as compared with an overall drop-out rate of 1.4 per cent in Lusaka the same year.

Malaney, P. (2000). The impact of HIV/AIDS on the education sector in Southern Africa

Summary: According to the author, the linkage between the education system and the AIDS epidemic can be seen as a dual one. On the one hand, the school system provides a mechanism for the transmission of information about HIV and hence can play a central role in the prevention effort. On the other hand, the disease undermines the structure and function of the education system itself.

The study focused primarily on the latter effect and developed a framework to assess the various aspects of the burden imposed by the disease.

The author lays out the framework to consider the range of effects that AIDS will have on the education sector. He then develops a model to assess the demand and supply effects of disease on the school system and to project necessary inputs in order to maintain educational quality. The study employs Namibia as a case study, using the model. Quantitative assessments of the extent of the impact on school systems are presented. That information is supplemented by qualitative data derived from focus groups conducted among schoolteachers and from in-depth interviews with principals.

Study area: Southern Africa.

Sample: Not applicable.

Methodological approach: Construction of input-output model, focus group discussions.

Key Results: According to the author, "Attendance is affected both directly and indirectly as a result of AIDS-related morbidity and mortality. Children orphaned by the disease will in many cases simply drop out, as they can no longer afford to attend school. In cases where caretaking responsibilities fall on students, absenteeism is likely to increase, and studies have shown that children who are excessively absent from school tend to perform poorly and drop out prematurely. Studies have also shown that the quality of education influences attendance". Using modelling with a lower enrolment for orphans (assumed at 76 per cent), the study projected that the total enrolment rate would decline to 86.7 per cent in 2005 and 85 per cent in 2010. In the study, the gross enrolment rate in Namibia was estimated at 87 per cent in 1999.

Schaeffer, S., (1994). The impact of HIV/AIDS on education: a review of the literature and experience

Summary: The study reviews the literature on HIV/AIDS and education. It states that the most immediate and visible impact of HIV/AIDS has already appeared in many education systems of the world. Children infected at birth have not lived to enrol in school; some of the children enrolled have dropped out of school in order to earn money for their families and care for ill relatives; and teachers have fallen ill and have died. In addition, as a result of the presence of HIV in the classroom and school, the process of teaching and learning itself has become more complicated and more difficult, and its quality has deteriorated. In some societies, this impact is barely noticeable, hidden by the normal process of change and subsumed by the more obvious and immediately visible problems of poverty, drought, war and other illnesses.

Countries: Not applicable.

Study area: national or regional: Not applicable.

Methodological approach: Literature review.

Key results: Fewer children will be born in societies where HIV/AIDS is present than in those where it is not present. Most children infected perinatally will develop AIDS and die before reaching school age, and many children may not enrol in school or may leave school owing to the direct and indirect effects of AIDS. The decrease is already evident in some areas such as the Rakai district of Uganda, with a drop in enrolment from 1,534 children in 1989 to 950 in 1993.

Studies also show that, in the United Republic of Tanzania, some 14,460 teachers will die by 2010 and 27,000 teachers by 2020. The study estimates that the approximate cost of training replacement teachers will be $37.8 million. In Uganda, between 1993 and 1996, it was estimated that 2,200 teachers were suffering or dying from AIDS, with a replacement cost of 1.1 billion Uganda shillings or $1 million.

The net result of the various kinds of impacts on the demand, supply and process of education may be a loss of both financial and human resources (and thus the quantity of education) and of efficiency and effectiveness (and thus the quality of education).

Izazola, J-A., J. Saavedra, J. Prottas and D. Sheppard (1998). Expenditures on the treatment and prevention of HIV/AIDS in Mexico

Summary: The study presents estimates of the total public and private spending on AIDS prevention and treatment in Mexico and compares the level of subsidy for AIDS treatment with subsidies for curative care in general. It provides background on the AIDS epidemic in Mexico and the health care system, reviews the methodology used to estimate costs and presents the expenditure estimates. It concludes with a discussion of the determinants of those spending patterns.

Country: Mexico.

Study area: National coverage.

Methodological approach: Estimates of AIDS prevention and treatment expenditures were made by using official government budgets and by interviewing physicians, representatives of non-governmental organizations and top officials in social security institutions and major public hospitals. A household survey (ENSA II) was used to estimate private, out-of-pocket expenditures. Most of the documents used for the study contained 1994 expenditures, the latest available data at the time of the analysis (May 1996). The expenditures were then corrected based on 1995 planned spending increases and converted to United States dollars for comparability.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: The results show that Mexico spent $79.1 million on AIDS-related health care and prevention in 1995, or about 1 per cent of its total (private and public) health expenditures. For an estimated 15,800 people with AIDS, that expenditure seems a very heavy burden, according to the authors. About 63 per cent of total AIDS costs went directly to treatment.

Koné, T., A. Silué, J. Agness-Soumahoro, R. Bail and D. Shepard (1998). Expenditures on AIDS in Côte d'Ivoire

Summary: The study analyses the expenditures on AIDS in Côte d'Ivoire in relation to total health care expenditures; the source of funding for treatment, prevention and activities to mitigate the impact of AIDS; and the determinants of those funding patterns. In particular, it shows how government policies result in explicit and implicit subsidies that support hospital care.

Country: Côte d'Ivoire.

Study area: National coverage.

Methodological approach: As insufficient systematic data on costs and expenditures were available, a workshop was organized in May 1996 in Abidjan with AIDS experts, including physicians, leaders of non-governmental organizations, epidemiologists, health economists, a traditional practitioner, and representatives of the National AIDS Control Programme (NACP). Using a structured survey, workshop participants estimated the costs of treatment for various types of patients. In order to improve and adjust the preliminary estimates, additional data were collected from government documents, international institutions, research studies, prescribing guides and non-governmental organizations.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures broken down by public, private and donors.

Key results: AIDS expenditures represented 8.5 per cent of total health spending in 1995. Most AIDS expenditures were financed by private sources (50.3 per cent) as compared with Government (42.0 per cent) and donors (7.7 per cent). Treatment expenditures (92.5 per cent of total expenditures on AIDS) were far in excess of prevention (7.2 per cent) or mitigation (0.3 per cent) expenditures.

Kongsin, S., C.S.M. Cameron, L. Suebsaeng and D. Shepard (1998). Levels and determinants of expenditure on HIV/AIDS in Thailand

Summary: The study examines the level of health expenditures in Thailand. The Thailand National AIDS Control Programme (NACP) has evolved in complex and interrelated ways in response to the changing epidemic and lessons learned about prevention and control. The report focuses on the costs of AIDS prevention and treatment. The authors present an analysis of the NACP budget by programme and by ministry; estimate the costs of caring for persons with AIDS; analyse the combined national costs of AIDS prevention and control by source of funding; and compare AIDS expenditures with expenditures on other health programmes.

Country: Thailand.

Study area: National coverage.

Methodological approach: Household survey, financial reports of public expenditures or budgets and country workshops to estimate treatment costs by type of patient.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: In 1994, $95.5 million was spent on AIDS prevention and treatment by public and private sources. Of that amount, 88 per cent was provided domestically, and the remaining 12 per cent came from official development assistance (ODA), including bilateral aid. As the Government of Thailand provides the vast majority of resources, the Government has significant power to direct how those funds are invested. This situation differs from that observed in many other countries where official development assistance dominates funding of HIV/AIDS-related activities.

Shepard, D.S. (1998). Levels and determinants of expenditures on HIV/AIDS in five developing countries: overview

Summary: The study is based on case studies from five developing countries with moderate to severe AIDS epidemics and a range of economic conditions: Brazil, Côte d'Ivoire, Mexico, Thailand and the United Republic of Tanzania. A common methodology was used across all five case studies. This study found that, with the exception of Mexico, public funding per capita for HIV/AIDS rises with higher gross national product per capita. Brazil, with the highest GNP, also has the highest AIDS expenditures per capita. The prevalence of HIV also affects AIDS expenditures. The United Republic of Tanzania, with the highest prevalence among the countries under study, has moderately high expenditures despite having the lowest GNP per capita.

Countries: Brazil (Sao Paulo only), Côte d'Ivoire, Mexico, Thailand and United Republic of Tanzania.

Study area: National coverage.

Methodological approach: For each country, the study relied on a combination of objective and subjective information. The study used five sources of data on expenditures:

- Financial reports of public expenditures or budgets
- Country workshops to estimate treatment costs by type of patient
- Special health-sector analyses (United Republic of Tanzania only)
- A detailed database of public hospital claims (Brazil only)
- Household surveys (Thailand only)

Detailed estimates of expenditures were obtained according to the use of funds (prevention, treatment and mitigation of the impact of AIDS) and by the source of finance. Where objective in-

formation was missing, incomplete, inconsistent, out of date or of questionable accuracy, informed experts were consulted. Except for countries where public sector health expenditure data were available from special studies, public budgets were used to estimate public expenditures.

Total health expenditures and the breakdown among public, private and donor financing were based on Murray, Govindaraj and Musgrove (1994), using data for 1990. Overall health expenditures were extrapolated to the target year by assuming the same ratio of health expenditure to GDP and the same distribution of expenditure among funders (public, private and donors) as in 1990. The specific sources of data are described in each case study.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: Health expenditures.

Key results: The study found an increase in the HIV/AIDS-related health expenditures in each of the countries studied.

Tibandebage, P., S. Wangwe, P. Mujinja, R. Bail and D. Shepard (1998). Expenditures on HIV/AIDS in Tanzania

Summary: The study examines expenditures on AIDS, their breakdown by source of financing and by intervention, and their major determinants. Both quantitative data from research studies and government documents and secondary qualitative information are used. In addition, the study benefited from information obtained from the proceedings of a workshop attended by experts in clinical, epidemiological, social and economic aspects of HIV/AIDS, and from interviews with officials in the Government and with representatives of non-governmental organizations whose activities include treatment, prevention and/or mitigation of the impact of AIDS.

Country: United Republic of Tanzania.

Study area: National coverage.

Methodological approach: The study relied on a combination of objective and subjective information: financial reports of public expenditures or budgets, country workshops to estimate treatment costs by type of patient and special health-sector analyses.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: Most financial resources in the Tanzanian health sector were allocated to treatment: 59.5 per cent of total health care expenditures went for treatment, whereas prevention interventions received 39.6 per cent of total health expenditures. In contrast, most financial resources for HIV/AIDS and STDs were allocated to prevention (84.1 per cent).

F. STUDIES ON ECONOMIC GROWTH

Arndt, C., and J.D. Lewis (2000). The macro implications of HIV/AIDS in South Africa: a preliminary assessment

Summary: The authors reported the preliminary results from an analysis of the macro implications of HIV/AIDS in South Africa. They constructed an economy-wide simulation model that embodied the important structural features of the South African economy, into which they added major impact channels of the HIV/AIDS epidemic. Using demographic estimates for the impact of the epidemic (on labour supply, death rates and HIV prevalence), along with assumptions about the behavioural and policy responses (household and government spending on health, slower productivity growth), the authors generated two scenarios: no-AIDS and AIDS scenarios. The results showed that over the period 1997-2010, GDP growth rates for the two scenarios would diverge steadily, reaching a maximum difference of 2.6 percentage points by the end of the projection period of 2010.

Country: South Africa.

Methodological approach: Simulation model with two scenarios: hypothetical no-AIDS and the AIDS scenario.

Outcome studied: GDP growth rate and level.

Key results: Gross domestic product level in 2010 is 17 per cent lower in the AIDS scenario than in the no-AIDS scenario. The growth rate of GDP is 2.6 percentage points lower in 2010 than it would have been in the absence of AIDS.

Barnett, T., and A. Whiteside (2000). Guidelines for preparation and execution of studies of the social and economic impact of HIV/AIDS

*Summar*y: The authors propose guidelines for the study of the social and economic impact of HIV/AIDS. The guidelines are intended for policy makers and researchers for those countries with serious HIV/AIDS epidemics. The goal is to place socio-economic impact studies in the planning process of a country in a systematic way. Countries are increasingly adopting strategic approaches to planning and implementation.

Bloom, D.E., D. Canning and J. Sevilla (2001). The effect of health on economic growth: theory and evidence

Summary: Macroeconomists acknowledge the contribution of human capital to economic growth, but their empirical studies have defined human capital solely in terms of schooling. In the paper the authors extended production function models of economic growth to account for two additional variables that microeconomists have identified as fundamental components of human capital: work experience and health. The main result of the study was that good health has a positive, sizeable, and statistically significant effect on aggregate output. Average work experience varied little across countries; therefore, differentials in work experience accounted for little variation in rates of economic growth. The authors also found that the effects of average schooling on national output were consistent with microeconomic estimates of the effects of individual schooling on earnings, suggesting that education creates no discernible externalities.

Countries: National-level data for 104 countries.

Methodological approach: Regression modelling of growth rate of GDP. In the regression, the inputs were physical capital, labour and human capital. Panel data for 1960-1990 were used.

Outcomes studied: Output or gross domestic product.

Key results: The main result of the study was that good health (lower mortality) had a positive, sizeable and statistically significant effect on aggregate output. There was little variation across countries in average work experience; therefore, differentials in work experience accounted for little variation in rates of economic growth.

Botswana Institute for Development Policy Analysis (2000). The macroeconomic impact of HIV/AIDS in Botswana

Summary: The objective was to estimate the impact of HIV/AIDS on macroeconomic indicators, including GDP and unemployment. Under the scenario considered most likely, HIV/AIDS reduced the growth rate of GDP by 1.5 percentage points, so that after 25 years the economy would be 31 per cent smaller than it would otherwise have been. Per capita GDP was, however, virtually unaffected by HIV/AIDS owing to the projected population impact. The model predicted that unemployment among unskilled workers would be lower as a result of HIV/AIDS, and the existing shortage of skilled workers would be exacerbated, causing a 12-17 per cent rise in skilled wages. The model also predicted an 18 per cent rise in the capital-output ratio. The Botswana economy is significantly more capital intensive than most African countries, which offers a shield against the labour impacts of HIV/AIDS. In addition, diamond revenues will continue to ensure that investment is not constrained by savings in the medium term. HIV/AIDS will, however, worsen existing skilled labour shortages and will put pressure on already overburdened systems to import expatriate skills. In the medium term, a shortage of skilled labour may also have a signifi-

cant negative impact on investor confidence. The predictions of the model are sensitive to small changes in investment growth. The results suggest that the key area for government intervention is in skilled labour supply, investment and productivity. Policy efforts should be devoted to maintaining investment, especially in the private sector.

Methodological approach: A two-sector, three-factor equilibrium model for the Botswana economy was constructed to project the growth path of the economy over a 25-year period, from 1996 to 2021, under "with-AIDS" and "no-AIDS" scenarios. The model distinguished between skilled and unskilled labour and between the formal and informal sectors. The impacts of HIV/AIDS operated through the supply of labour and through investment growth.

Output studied: GDP growth, unemployment, wages and capital-output ratio.

Keys results: AIDS is projected to reduce the annual growth rate of GDP by 1.5 percentage points over the 25-year period but to have no effect on the growth rate of GDP per capita. AIDS will worsen the shortage of skilled workers.

Over, M. (1992). The macroeconomic impact of AIDS in sub-Saharan Africa

Summary: The paper was one of the first studies to provide detailed calculations of the probable magnitude of the impact of HIV/AIDS. Growth trajectories of 30 sub-Saharan African countries were projected for the period 1990-2025 under "with-AIDS" and "no-AIDS" scenarios. One purpose was to explore how the economic effects of the epidemic depended on alternative assumptions about its distribution and the financing of its costs. The study found that an AIDS epidemic could reduce the growth rate of per capita income in the average country even when it was evenly distributed across productivity classes of workers, provided that at least half of the treatment costs were extracted from savings. For the assumptions regarded as most plausible—that each education class had double the risk of the one beneath it, and that half of the treatment costs were financed from savings—the net effect of the AIDS epidemic was to reduce the annual growth rate of per capita GDP by about one third percentage point in the 10 countries with the most advanced epidemics.

Methodological approach: A two-sector (rural-urban) partial equilibrium neoclassical economic growth model was constructed, distinguishing three classes of workers (defined by level of education).

Outcomes studied: Growth of per capita GDP.

Key results: During the period 1990-2024, annual growth rate of per capita GDP reduced by about one-third percentage point in the 10 countries with the most advanced epidemics.

Quattek, K., and T. Fourie (2000). Economic impact of AIDS in South Africa: a dark cloud on the horizon

Summary: The study uses the Wharton Econometric Forecasting Associates' time series-based macroeconomic model to derive the impact of HIV/AIDS on the economy of South Africa for the period 2000-2015. The model shows that AIDS will reduce the annual growth rate of GDP by 0.2-0.3 percentage point up to 2005 and thereafter by 0.3-0.4 percentage point. Since AIDS is expected to reduce population growth by a larger proportion, per capita income is projected to be higher, as compared with a no-AIDS scenario.

Methodological approach: Macroeconomic model widely used in commercial forecasting.

Outcomes studied: Gross domestic product, domestic savings, household disposable income, unemployment, trade.

Key results: AIDS is expected to reduce the annual growth rate of GDP by 0.3-0.4 percentage points by 2011-2015. GDP per capita is projected to be higher in the AIDS scenario than in the no-AIDS scenario.

Rühl, C., V. Pokrovsky and V. Vinogradov (2002). The economic consequences of HIV in Russia

Summary: The study examined the impact of AIDS on the economy of the Russian Federation. The HIV prevalence rate was still low, but the authors predicted that the impact of the disease on the Russian economy would be worse owing to the population decline. By 2010, they projected that GDP would be 4.5 per cent lower, and without intervention the loss would rise to 10.5 per cent. The study also projected that investment would decline more than production, around 14.5 per cent in 2020. Negative population growth would impede investment and economic growth by rerouting resource flows towards consumption. HIV/AIDS exaggerated the effect.

Country: Russian Federation.

Methodological approach: The computer model utilized in the study distinguishes between three HIV transmission groups: transmission among drug users; from drug users to non-drug users; and among non-drug users. A total of 26 input parameters were included in the model. The results of model calibration indicated that the set of four parameters to which the economic consequences of HIV reacted the most were the rate of population growth, the rate of growth of drug users, the HIV transmission rates and the multiplier.

Outcomes studied: Gross domestic product.

Key results: By 2010, the authors projected that GDP would be 4.5 per cent lower and that without intervention the loss would rise to 10.5 per cent. The study also projected that investment would decline more than production, by around 14.5 per cent in 2020.

Theodore, Karl (2001). HIV-AIDS in the Caribbean: economic issues—impact and investment response

Summary: The paper estimates the impact of HIV/AIDS on the economies of the Caribbean. The author uses the output of a 1997 study on the impact of HIV/AIDS in Jamaica and Trinidad and Tobago as the starting point and updates the projections of those two countries based on adjustments to some of the underlying assumptions with respect to the epidemiology of the disease. The study identifies four channels through which the HIV/AIDS epidemic can affect the development process and makes the case that HIV/AIDS has the potential to distort that process. Two scenarios are considered based on the medical coverage of AIDS patients.

Countries: Jamaica, Trinidad and Tobago and St. Lucia.

Methodological approach: The analysis employs an econometric model distinguishing agricultural, manufacturing and services sectors, fitted to the economies of the three countries. The model comprises five blocks: labour supply and wages, employment, saving and investment, cost of HIV and output.

Outcomes studied: Gross domestic product.

Key results: Declines of the gross domestic product by 2005 of 4.9 per cent in Jamaica, 2.1 per cent in St. Lucia and 5.6 per cent in Trinidad and Tobago were estimated in the first scenario in which 100 per cent of patients were medically covered. In the second scenario, in which only 20 per cent were covered, the declines were 3.2 per cent, 1.6 per cent and 4.9 per cent respectively.

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