

HIV/AIDS in Kenya: A Review of Research and Policy Issues

Robert K. Nyaga
Diana Njeri Kimani
Germano Mwabu
Mwangi S. Kimenyi

Social Sector Division
Kenya Institute for Public Policy
Research and Analysis

KIPPRA Discussion Paper No. 38
June 2004

KIPPRA IN BRIEF

The Kenya Institute for Public Policy Research and Analysis (KIPPRA) is an autonomous institute whose primary mission is to conduct public policy research, leading to policy advice. KIPPRA's mission is to produce consistently high-quality analysis of key issues of public policy and to contribute to the achievement of national long-term development objectives by positively influencing the decision-making process. These goals are met through effective dissemination of recommendations resulting from analysis and by training policy analysts in the public sector. KIPPRA therefore produces a body of well-researched and documented information on public policy, and in the process assists in formulating long-term strategic perspectives. KIPPRA serves as a centralized source from which the government and the private sector may obtain information and advice on public policy issues.

Published 2004

© Kenya Institute for Public Policy Research and Analysis

Bishops Garden Towers, Bishops Road

PO Box 56445, Nairobi, Kenya

tel: +254 20 2719933/4; fax: +254 20 2719951

email: admin@kippra.or.ke

website: <http://www.kippra.org>

ISBN 9966 949 63 1

The Discussion Paper Series disseminates results and reflections from ongoing research activities of the institute's programmes. The papers are internally refereed and are disseminated to inform and invoke debate on policy issues. Opinions expressed in the papers are entirely those of the authors and do not necessarily reflect the views of the Institute.

KIPPRA acknowledges generous support from the European Union (EU), the African Capacity Building Foundation (ACBF), the United States Agency for International Development (USAID), the Department for International Development of the United Kingdom (DfID) and the Government of Kenya (GoK).

Abstract

This paper examines the magnitude, distribution and causes of HIV/AIDS in Kenya, including responses to fight the disease. An account is also provided of theoretical and empirical economics research approaches used in analysing the impact of HIV/AIDS. On average, statistics show that HIV/AIDS prevalence rates in urban areas are higher than in rural areas, and that HIV/AIDS is imposing heavy costs on the economy, primarily through increased medical care expenditure and labour losses. There are no strong indications that the epidemic is declining, casting doubts on the success of past anti-AIDS efforts. The true impact of awareness-creation campaigns in reducing new infections is still uncertain despite that most funds for intervention are channelled to these efforts. Medical treatment of AIDS patients, which can prolong life and prevent loss of productive labour, has received little attention or funding.

This study suggests a partial policy shift from awareness campaigns to prevention, early diagnosis, treatment, and economic and social support for those infected and affected. To forestall momentous economic losses, we recommend an incentive mechanism that promotes three important inputs to the national AIDS management programme:

- Data on early-diagnosis and follow-up programmes to allow for animation of case-specific interventions, with voluntary counselling and testing (VCT) forming the backbone for medical, economic and social support regimes;
- Collection of incidence and general prevalence data to serve as impact indicators and for impact analysis and long-term planning;
- Favourable and sustainable linkage of all awareness campaigns, VCT drives and follow-up strategies, treatment regimes and social and economic support programmes to the Poverty Reduction Strategy Papers (PRSP) and the budgeting process, i.e. Medium Term Expenditure Framework (MTEF), with greater commitment of government allocations to these programmes rather than dependency on donor funding.

This Discussion Paper is produced under the Umbrella Project for *Improving the Enabling Environment for Businesses in Kenya*. The aim of the Project is to improve the policy, legal, and regulatory environment for businesses. The Project has three components. The **Simplifying the Regulatory Environment for Business (SREB)** component involves research on constraints to operation of business by the private sector in Kenya. The **Private Sector Advocacy** component assists the private sector in advocating for reforms that create a favourable environment for business and investment. The **Capacity Building** component aims to build capacity in line ministries and regulatory agencies to respond to reform proposals made by the private sector and other stakeholders. KIPPRA implements the first and third components while the Kenya Private Sector Alliance implements the advocacy component. The Project is funded by the British Department for International Development (DfID).

Acronyms

ACP	National AIDS Control Programme, Uganda
AIC	AIDS Information Centre, Uganda
AIDSCAP	AIDS Control and Prevention Project
APS	AIDS Programme Secretariat
ARV	Antiretrovirals
CBS	Central Bureau of Statistics
CGE	Computable General Equilibrium
COI	Cost of Illness
FHI	Family Health International
IEA	Institute of Economic Affairs
MTEF	Medium Term Expenditure Framework
NACC	National Aids Control Council, Kenya
NAPCC	National AIDS Prevention and Control Committee, Thailand
NASCOP	National AIDS/STD Control Programme
PRSP	Poverty Reduction Strategy Paper
SID	Society for International Development
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TASO	The AIDS Support Organization
UAC	Uganda AIDS Commission
VCT	Voluntary Counselling and Testing
WHO	World Health Organization
WTP	Willingness to Pay

Table of Contents

1.	Introduction	1
2.	HIV/AIDS in Kenya	4
	2.1 Determinants of HIV/AIDS prevalence	6
	2.2 Impact of HIV/AIDS in Kenya	15
	2.3 Government response to the AIDS epidemic	20
	2.4 Experience of other countries with HIV/AIDS	24
3.	Theoretical Issues and Empirical Evidence	29
	3.1 Micro and meso-level effects	29
	3.2 Macro-level effects	36
4.	AIDS Research Methodologies in Economics	41
5.	A Case for Further Research	48
6.	Priorities and Policy Issues	52
	References	56
	Appendix	60

1. Introduction

Since its emergence in the early 1980s, HIV/AIDS has spread at an alarming rate worldwide with the number of new infections rising each year. Africa continues to bear the brunt of the scourge. Globally 42 million people are infected with HIV/AIDS, 29.4 million of them in sub-Saharan Africa (Appendix table A1). There were 3.5 million new HIV/AIDS infections in sub-Saharan Africa in 2002 out of the 5 million worldwide (Appendix table A2). Furthermore, majority of the more than 21.8 million people who have died from HIV/AIDS since the start of the epidemic from Africa. In addition, AIDS deaths have left over 8 million orphans in sub-Saharan Africa. These high rates of HIV/AIDS incidence make the disease the leading cause of death in Africa (WHO/UNAIDS, 2002).

HIV infection rates in Kenya were low in the 1980s. However, by the end of 1998, almost 14% of Kenya's adult population was living with the HIV virus, or about 2.1 million people (WHO/UNAIDS, 2002). According to the Kenya Economic Survey for 2003 (GoK, 2003). HIV prevalence rates have however declined from about 13% in 2000 to 10.2% in 2002. This is a tremendous decline, which is attributed to vigorous advocacy campaigns against the disease by the government and other organizations.¹

Kenya ranks ninth in Africa in AIDS prevalence, with Botswana leading with an adult infection rate of 35.8%, followed by Swaziland and Zimbabwe with rates of 25.25% and 25.06%, respectively (Loenwenson and Whiteside, 2001).

¹ The adult prevalence data, unlike incidence studies, may potentially be misleading. For instance, falling prevalence rates do not indicate that new infections are declining, which may be of significance in policy.

Whether HIV/AIDS incidence rises or falls in the future does not fundamentally change the understanding that the disease poses grave health and developmental problems in Kenya. Although the HIV/AIDS impact is difficult to measure, it has been shown that growth in economies badly hit by the epidemic may be 25% lower than it would have been in the absence of AIDS. Studies show that the macroeconomic impact of AIDS in terms of declining GDP growth rate is about 0.3 to 1.5% in Africa (Bonnell, 2000; Arndt and Lewis, 2000). The disease affects individuals and households (the human capital stock) resulting in serious negative effects on almost all sectors of the economy, including household and individual welfare.

Despite the many efforts to fight AIDS and the rising awareness of the disease, the epidemic continues to claim lives while imposing heavy costs on the Kenyan economy. Awareness creation campaigns have not developed the tempo necessary to reverse the spread and cushion the economy against the impact of the epidemic. Further, reliable economic research on the actual cost of the disease is lacking, which means that policy on the disease is based on speculative and non-objective data. Much of the research in Kenya is either sector-specific case studies or surveys of specific risk groups, including medical and clinical studies. Some of these may be regarded as doomsday-scenario studies designed to raise awareness or justify funding for the fight against AIDS.² This could have been necessitated by the inherent nature of the AIDS scourge and data problems, which have hindered more scientific and objective research on the economic aspects of the disease. Reliable incidence³ data have been difficult to collect owing to the stigma attached to HIV/AIDS

² Lack of objectivity in research on AIDS may propagate stigmatization against those infected, which goes against the desired public objectives.

³ The Centre for Disease Control (CDC), Central Bureau of Statistics (CBS) and National AIDS/STD Control Programme (NAS COP) are conducting a survey based on actual HIV tests and targeting 8000 households.

infection. Basically, reliability of the sentinel data used to estimate adult HIV prevalence is questionable on many grounds, even with improved demographic and data-collection skills.

Descriptive studies have been conducted on the effects of AIDS on various sectors, households and individuals, but these effects are rarely quantified. The impact of the pandemic on the whole economy and on macro indicators such as economic growth, interest rates, levels of investment and human capital stock has not been assessed in Kenya. However, it is possible to quantify the AIDS impact on these and other indicators using various economy-wide simulation models alongside econometric models. This paper attempts to develop both theoretical and empirical frameworks for such an effort. The paper also briefly reviews the AIDS situation in Kenya and the economic research methodologies used in AIDS research, and identifies areas for research. The paper also discusses various methods and strategies used to fight AIDS. These include the new thinking about AIDS interventions and associated factors concerning funding for interventions, VCT services, and access to antiretrovirals (ARVs) and treatment for opportunistic diseases and other assistance to those infected and affected, all which will help stem possible collapse of human capital and productivity.

The following section presents an overview of HIV/AIDS in Kenya. Section 3 discusses theoretical and empirical accounts of AIDS research, while Section 4 reviews various research methodologies. Sections 5 and 6 identify areas for further research and provide a policy relevant discussion.

2. HIV/AIDS in Kenya

Since the emergence of HIV/AIDS in Kenya in 1984, the epidemic has spread unabated. Fairly reliable estimation techniques put the number of adults and children living with HIV/AIDS at about 2.5 million by year 2001 according to WHO/UNAIDS (2002). Adults aged 15-49 account for 2.3 million of this number, and children account for 0.22 million (table 1). The table also shows that over half of all those infected are women.

Table 1: Estimates of HIV/AIDS situation by 2001

Group	Number infected
Adults and children living with HIV/AIDS	2,520,000
Adults living with HIV/AIDS (15-49)	2,300,000
Women living with HIV/AIDS (15-49)	1,400,000
Children (0-15)	220,000
Deaths in 2001	190,000
Number of orphans below 15 years old =	890,000

Source: WHO (2002); UNAIDS (2002)

HIV prevalence among adults in Kenya was expected to increase from 5% in 1990 to 14% at the end of 1998, pointing to possible negative effects on the countries' human capital base. However, HIV prevalence rates declined nationally from 13.4% in year 2000 to 10.2% in year 2002 (table 2). The rates are higher in urban centres than in the rural areas. Urban infection rates stood at 17.5% in year 2000 compared with 13.5% for rural areas. The rates have declined in both regions. The slight decrease in prevalence rates in year 2000 is mainly due to high mortality rates (GoK 2001a) rather than low infection. However, further decreases to

10.2% in 2002 could be attributed to intervention programmes against HIV/AIDS.

Table 2: Prevalence rates for 1996-2003

Prevalence	1996	1997	1998	1999	2000	2001	2002	2003
Urban	16.3	16.9	18.1	17.8	17.5	17.0	16.5	10.0
Rural	11.0	11.9	13.0	13.0	13.0	13.0	12.5	5.6
National	11.9	12.8	13.9	13.5	13.4	13.0	10.2	6.7

Source: Government of Kenya (2001a, 2003)

For the year 2002, Nyanza Province had the highest prevalence rate of 23%, followed by Eastern and Rift Valley provinces each with 19%. Nairobi had a prevalence rate of 9%, though it has the highest rate among urban areas. North Eastern Province has the lowest rural and urban prevalence rates (Appendix table A3).

Sentinel data for sexually transmitted illnesses (STIs) for 1990-2001 show that prevalence rates have been rising among all categories of marital status. Prevalence is highest among the widowed (implying that their spouses most likely died from AIDS-related ailments) and among people who are separated, followed by people in polygamous unions. It is lowest among single people and those in monogamous unions (Appendix table A4). These variations in rates between monogamous and polygamous unions may be explained by the fact that polygamous unions expose more people to infection from one person, whereas in monogamous unions the spread is limited to two people. The high rates among separated people are likely to be associated with the likelihood that they may engage in risky sexual behaviour following disruption of their normal life and as a way of consoling themselves.

Gender is an important factor in AIDS incidence. Young women aged 15-19 are five times more likely than men in this group to be infected with HIV, and women aged 20-24 three times more likely than men in

the same age group. Various reasons, though devoid of reliable research evidence, have been put forth as to why young women are more at risk than men. These include gender-specific biological factors, the tendency for younger women to have sexual relationships with older men, and the poor economic status of women. Statistics (UNAIDS/WHO, 2000) show that commercial sex workers are the hardest hit group by AIDS, and prevalence among this group has been rising since the first cases of HIV were reported in Kenya in 1984. In Nairobi, HIV prevalence rates among sex workers had reached 62% in 1985 and increased to 86% by 1992 (UNAIDS/WHO, 2000)

The large number of AIDS orphans provides a grim picture of the AIDS epidemic. Since the epidemic was first reported, the number of children who have lost either their mother or both parents to AIDS when they were less than 15 years old had reached about 890,000 in 2001 (table 1). This poses great challenges for the government, since these children need care and schooling to grow into productive citizens.

2.1 Determinants of HIV/AIDS prevalence

There is no consensus on either the major causes of HIV in Africa or why Africa accounts for the overwhelming share of HIV/AIDS cases in the world. The main modes of transmission of HIV are sexual intercourse, re-use of contaminated syringes by drug users, mother to child infection through birth or nursing, re-use of needles in medical settings, and transfusion of contaminated blood or blood products. HIV cannot be transmitted by a sneeze, a handshake or other casual contact.⁴ However, it is believed that heterosexual sex, compounded by the unsafe sex practices dominant in Africa, is the leading transmission mechanism

⁴ HIV can be isolated from the saliva of an infected person. Although there are a handful of cases of transmission through oral sex, there are no confirmed cases of transmission via saliva alone.

of HIV. This may explain why most anti-AIDS campaigns advocate sexual behaviour change and use of safe-sex options such as condoms. However, safe sex options are not widespread in Africa, where condom use is still 'taboo' and where the poor might not afford to spend Ksh 10 on a condom pack.⁵

A survey carried out by the Government of Kenya in collaboration with UNICEF covering the whole country in year 2000 (i.e., Multiple Indicators Cluster Survey (MICS) Report of 2000) shows that knowledge about the key means of prevention is low (Appendix table A5). Only 52% of women and 66% of men said they knew that a condom may be used to prevent transmission of HIV. More urban women than rural women are aware of the use of condoms in AIDS prevention. But the opposite is true for men. At the same time, both men and women claimed knowledge that faithfulness to one's partner or abstaining from sex was an option to prevent AIDS transmission. But knowledge of prevention mechanisms did not differ much with age, although it rose with education. For instance, only 39% of women without education were aware of the use of condoms for HIV prevention compared with 62% of those with secondary school education or higher. Similar trends were observed for other prevention methods. Some 83.3% of women and 93% of men were aware of at least one way of preventing HIV infection (GoK/UNICEF, 2003). The process through which knowledge translates into adoption of safe behaviour is complex and cannot be deduced from these statistics.

Factors that may drive the spread indirectly include lack of treatment for people with HIV/AIDS or lack of access to HIV/AIDS testing facilities. It is argued that individuals who test positive have a high likelihood of avoiding unprotected sex, and those who test negative

⁵ Alexander Cockburn. 'Why Africans get AIDS? Creators Syndicate-www.workingforchange.com

have an incentive to stay that way.⁶ GoK/UNICEF (2003) gives percentages of men and women who knew of a place to take a HIV test and those who have ever taken a test. Women are more likely than men to test for HIV even though men are more knowledgeable about facilities for testing. About 64% of women know of a testing place but only 10.4% have been tested; for men, this is 76% and 8.2%, respectively (Appendix table A6). Further, fewer rural women and men have been tested. For both women and men, the higher the level of education the higher the numbers that have been tested.

Several factors are thought to influence the spread of AIDS in Kenya, though none can be said to be dominant.

Cultural and gender factors

In Kenya, marriage increases exposure to HIV/AIDS, especially if one partner is not faithful. Women are disproportionately more vulnerable to infection. Primarily for them, a marriage may serve as a sure infection trap if the man is not faithful. This is made worse by cultural and socio-economic imbalances that favour men and leave women powerless in most decisions. Women in this context have little control over their own sexual behaviour let alone on that of their partner and cannot demand that their partner use preventive means to reduce chances of infection. Instances of physical violence are common in Kenya, including sexual violence.

An unfaithful partner may endanger the other, but the problems faced by women in general include exposure to infection as they give care to infected people without sufficient protection or information.

⁶ These are behavioural predictions that do not work independently of a maze of other factors; therefore, the direction of behaviour, especially in the long term, may be hard to predict a priori.

The desire by Kenyan women for many children accentuates the HIV/AIDS problem in the country, since it discourages use of preventive options such as condoms. Other risky cultural factors include teenage marriage and forced marriage of young girls to older men. Gender inequities in distribution of wealth and power relations give rise to asymmetric age matching, fostering sexual relations between young women and older men who are likely to be infected (IEA/SID, 2001). Widow inheritance is a risky cultural practice accounting for high HIV/AIDS infection rates. This rite is reinforced by taboos, superstition and fear of bad omen (IEA/SID, 2001).

Studies (NASCOPI 1998, 1999), though inconclusive, show some effect of male circumcision in reducing the chance of infection. This is a controversial issue that cannot fully be settled through studies. In studies at a special treatment clinic in Nairobi on male circumcision and the risk of STIs and HIV, sero-conversion rates were 2.5% for circumcised and 29% for uncircumcised men. For men with genital ulcer disease, the rates were 13.4% for circumcised and 52.6% for uncircumcised (NASCOPI, 1999). Female partners of uncircumcised HIV-positive men also run higher risk of infection. However, being circumcised is not a shield from HIV infection, since in some communities circumcision rituals subtly encourage new initiates to seek sexual encounters as proof of their manhood. In other communities, women are encouraged to secretly consider bearing at least one child from an extramarital affair, to spread the genes of their children⁷.

The collapse of positive traditional cultural value systems takes some of the blame for the spread of HIV/AIDS. For instance, replacement of traditional marriage practices with modern value systems has given rise to prevalence of cohabitation in both rural and urban Kenya. This

⁷ These complex cultural norms and values are not always in the public domain and therefore are hard to stamp out.

also includes degradation of traditional support systems, especially in urban areas, and lack of clear cultural identity among the youth, who are exposed to both traditional and western influences.⁸ Inadequate communication and awareness campaigns about HIV/AIDS and its prevention have also been responsible for the spread of HIV/AIDS⁹. For instance, parents shy away from discussing sex issues with their children. Also, members of parliament, who play a crucial role in policy formulation and advocacy and who can be used to sensitise their constituents on the issues of AIDS are still shying away from discussing issues of HIV/AIDS. A media opinion poll, in which 3,000 people throughout the country were interviewed shows that religious bodies have played a insignificant role in creating awareness about AIDS. Churches and mosques were only responsible for creating awareness among 4.7 per cent of respondents. An analysis by age shows that 15.5 per cent of teenagers were not aware of AIDS (Daily Nation, 2001). Other factors that influence HIV transmission are age at first sexual intercourse, number of partners, drug use, among others (WHO/UNAIDS, 2002).

Biological factors

Some biological characteristics particularly for women increase the risk of HIV infection. Transmission of the virus from men to women is at least four times more likely than from women to men. Women are more vulnerable to infection because the features permit greater mucosal (surface) exposure to seminal fluids. This is coupled with prevalence of non-consensual sex, unprotected sex, and high-risk sex partners. Sex

⁸ Thanks to the media and particularly to the new information and communication technologies, the youth have to cope with vast and diverse information on sexual behaviour.

⁹ We see later how unstable information-based interventions such as awareness campaigns are in predicting effect on infections.

among younger women and forced sex may cause micro lesions that raise efficiency of infection. Biological factors also influence the spread of the epidemic by increasing or decreasing susceptibility to the virus and hastening the progression of infection to disease and likely death. Such factors include the presence of sexually transmitted diseases, viral loads and type of HIV. Such factors should inform response and prevention strategies, which may include seeking use of microbicides in the case of women and antiretroviral therapy, among others.

HIV may be transmitted from mother to child during pregnancy, birth or after birth. This transmission pathway is common but can be minimized using AZT or a combination of antiretroviral drugs. The risk of mother-to-child transmission is increased if the mother is at an advanced stage of HIV, uses drugs or suffers severe inflammation of foetal membranes during birth, or if the period between membrane rupture and delivery is prolonged.

Economic factors

Economic factors play a pivotal role in the spread and control of HIV/AIDS. To start with, globalization and migration have facilitated free movement of people, goods and services across countries, which has led to separation of families for long periods, predisposing people to risky behaviour. In the developing world, increased mobility in search of jobs, rural-urban migration and industrialization have been identified as major factors in the spread of HIV. Mobile workers who are the most vulnerable to HIV/AIDS include those in the transport, fishing and tourism industries and migrant labourers in mines, oil fields, roads and dam projects. Major development projects requiring large migrant labour have increased the rate of the spread of HIV/AIDS.

The economic aspect of the spread of AIDS is not restricted to globalization and migration, but includes indebtedness and high costs

of HIV/AIDS-related drugs and equipment. For a long time, AIDS drugs such as AZT and ARVs, which delay progression of infection to fully blown AIDS have been out of reach of most patients in sub-Saharan Africa. The drugs basically catered for the rich who could afford. A GlaxoSmithKline's (GSK) HIV drug treatment cost USD 12,000 a year, compared with per capita health spending of USD 23 in low income countries. Intense lobbying across the world has helped lower the cost of anti-AIDS regimen considerably. GSK's HIV drug fell to USD 727 per year in 2003 (Bosley, 2003). However, this was still more than double the cost of equivalent generic drugs such Triomune, a three-drug cocktail, manufactured by Cipla of India, which costs \$304 per year (Boseley, 2003). Though willing to lower their prices, the hands of the main pharmaceutical companies are tied by the profit motive. Besides, these firms cannot make cheap generics like the generic companies due to patent restrictions. The plausible route therefore has been for them to argue that the UN buy ARVs in bulk and distribute them to poor and needy countries.

Drugs that prevent mother-to-child transmission of HIV are still in acute shortage in most developing countries. Supporting infrastructure and equipment such as HIV testing kits, which may have no cheaper alternatives, are also not easily available or are inappropriate for Kenya. Shortage of items like blood transfusion equipment, syringes and equipment for medical procedures may pose transmission risks. In countries like Kenya therefore demand for drug therapy within the average person's purchasing power outstrips supply.

Some of the poor, AIDS-ravaged nations are also the most indebted. The Heavily Indebted Poor Countries (HIPC) initiative created by G8 countries provides to waive the debt of some 33 poorest countries, with the reductions in debt commitment used in poverty and HIV/AIDS reduction. However, this misses the point because countries that qualify

for the waiver are not necessarily the most affected by the scourge. For example, although the scourge has heavily affected countries such as Kenya, Botswana and South Africa, these countries are not among the 33 poorest countries. They would therefore not qualify for the waiver.

Other problems that inhibit control and prevention of AIDS are poor access to medical care, inefficiency in delivery of medical services, and inadequate training of medical staff to handle AIDS patients.

Provision of anti-AIDS drugs is a form of public service with high positive externalities, which cannot be left to the markets and cannot be delayed without incurring heavy negative externalities.

Stigmatization

Stigmatization of people with HIV/AIDS leads to their discrimination and rejection at home, at the workplace and in the public. Workers infected with HIV/AIDS may be dismissed from employment or denied common benefits. In the family and community environment, discrimination takes the form of social ostracism and exclusion from the usual family or community networks. In any of the cases, gender biases become accentuated, as infected women face more rejection than men. The GoK/UNICEF (2003) report documents some aspects of discrimination perceptions (Appendix table A7). For example, some 39% of women and 51% of men believed that a “teacher with HIV should not teach” (GoK/UNICEF, 2003). Also, 33% and 42% of women and men, respectively, said they would not buy food from a person with HIV/AIDS. This shows that discrimination is marked among both genders, but is higher among men than women. This also points to clear misconceptions about how HIV is transmitted.

Stigmatization has had a big role in discouraging individuals from going public about their HIV status, which has been associated with avoidance

of risky sexual behaviour. Also, going public about HIV status makes one avoid risky behaviour because one is aware that people know that you are HIV+. In effect, stigmatization may cause dejected HIV positive people to strike back with vengeance, deliberately spreading the virus. Therefore, the costs of stigmatization go beyond psychological and emotional anguish of the infected person; they include the cost of new infections that would have otherwise been prevented if the community were more supportive and caring. It is important to appreciate the difficulty inherent in fighting stigmatization owing to its complex nature and that it is borne by AIDS patients. Many positive messages ostensibly designed to reduce stigmatization or raise awareness about HIV/AIDS and protection for those infected by the disease may subtly chide or torment those infected with HIV/AIDS.

Political and religious factors

There is a marked political dimension to the HIV/AIDS scourge. This mainly relates to disagreement over origins and causes of AIDS and how to tackle it. Sexual intercourse, an epitome of human privacy, is the main avenue through which AIDS is transmitted. Discussion about the role of sexual intercourse in HIV/AIDS transmission causes deep passions in both political and religious arenas. Failure by political and religious leaders to acknowledge the existence of the disease or to allow use of available preventive methods to curb the spread of the scourge attests to this, and has had bad effects on efforts to stop the spread of AIDS. For example, the Kenya government took long to concede to the fact that the HIV/AIDS pandemic was actually an economic, social and security problem. Religious leaders blame it on immorality and consider it a divine punishment for the promiscuous. Such views from opinion leaders influence the choice of prevention and intervention mechanisms for the AIDS problem, notwithstanding politics associated with AIDS drugs and funding for anti-AIDS efforts.

2.2 Impact of HIV/AIDS in Kenya

Available research (Nalo and Aoko, 1993; Forsythe *et al*, 1993; Forsythe and Roberts, 1995) though not exhaustive casts some light on the debilitating effects of AIDS on the Kenyan economy. In this section, we review evidence and studies on the effect of HIV/AIDS on various sectors of the economy. However, we note that much of this evidence is based on sectoral surveys, purposive studies and qualitative or non-quantitative analytical studies.

Health sector

HIV/AIDS affects the health system by undermining its capacity to perform, and by eroding the quality of care and the state of health facilities. AIDS also significantly affects health-related expenditures of households, private organizations and public health providers (Loenwenson and Whiteside 2001). Healthcare services for AIDS patients such as hospitalization and antiretroviral or AZT drugs in Kenya are inadequate given that the annual per capita public health expenditure in Kenya is only Ksh 216. This is a far cry from between Ksh 23,000 and Ksh 43,000 per month considered sufficient for effective management of an AIDS patient (IEA/SID, 2001).

Another problem affecting the health sector, especially the public healthcare system, is distortion of the health referral system as demand for quality care and desire for anonymity force AIDS patients to bypass primary care facilities and choose more expensive tertiary institutions. Also, AIDS has led to overcrowding in public health facilities with patients with AIDS-related illness occupying most beds. In 1992, 15% of hospital beds were occupied by AIDS patients; this rose to about 50% by 2000 (IEA/SID, 2001). The growing number of AIDS cases will aggravate this problem.

Apart from the direct health impacts, the epidemic also affects the health sector's human capital. It reduces the productivity of the health workforce through infection, illness and death of health workers or members of their families. Studies in Thika and Gatundu districts¹⁰ showed that doctors were highly vulnerable to HIV infection because safety standards are poor and there is poor access to post-exposure prophylaxis using ARVs. The reduction in the health sector workforce due to absenteeism and death compounds the already severe human resources problems in the sector.

Education sector

Though education is crucial to national development, income growth, labour productivity and creation of employment, it is severely distressed by the AIDS scourge. First, AIDS affects education demand by lowering school enrolment as AIDS orphans increase and as more children get infected with AIDS. The rise in child labour and child-headed households following the death or incapacitation of the breadwinner prevents such children from attending school (GoK, 2001a). Second, it affects education supply through loss of teaching staff and increasing teacher absenteeism. Third, it affects the quality of teaching and disrupts the organizational stability of schools with the loss of key education officials and headteachers.

Agriculture

Agriculture employs a large segment (80%) of the labour force and accounts for 70% of Kenya's export earnings; it is a major portion of the GDP. As the epidemic progresses, the agricultural sector is forced to adjust to the decrease in adult labour on farms (Rugalema *et al*, 1998). This means productivity will decline and knowledge about indigenous

¹⁰ Otieno J. and M. Mwaniki (Daily Nation, 23 September 2003). "Study highlights risks facing doctors in district hospitals."

farming methods will be lost. The consequences on food security are obvious.

Agricultural companies face steadily rising costs and losses in profits due to loss of workers, absenteeism and increased medical and funeral costs. Labour-intensive agricultural enterprises such as sugar estates, which depend heavily on outgrowers, lose reliable workers and farmers to the epidemic. Consequently, they have to face a decrease in the quantity and quality of inputs, leading to a poor recovery ratio in sugar production (Rugalema *et al*, 1998).

Industry, business and markets

As the HIV/AIDS epidemic spreads in Kenya, it seems to pose the greatest threat to the health and well-being of employees. In some companies such as the agro-industries of the 'sugar belt' in Kisumu District, roughly one in three employees is HIV positive (NASCO, 1998). Direct and indirect costs imposed on industries include lost work hours from worker absenteeism and reduced work effort due to illness. Evidence shows that between 1995 and 1997, one agro-industry lost a total of 8007 labour days due to illness of its employees (IEA/SID, 2001).

Other costs are associated with loss of experience or special skills when highly trained and experienced employees die or are incapacitated. For instance, it takes several years to train a fresh graduate to become a sugar engineer. Loss of such skilled and highly trained persons results in setbacks in sugar processing and production, and in other highly labour-intensive agro-industries.

Loss of workers necessitates recruiting of new employees. This has cost implications relating to advertising, selection and training. In many cases, each death forces the remaining workers to share the tasks previously handled by the dead colleague. In sugar factories, for example, the average working time increased from 1 workday in the

late 1980s to 1.6 workdays in 1998. This may lead to work stress and extra costs in terms of overtime payments (Rugalema *et al*, 1998).

Both morbidity and mortality compromise efficient planning, management and use of human resources in an industry by making it difficult for managers and supervisors to budget time and other resources for a workforce. All these result in reduced labour productivity and affect output and profits in labour-intensive industries. Frequent illness of experienced staff and the consequent long working hours of non-morbid employees partly explain the consistently declining cane-to-sugar recovery ratio in the sugar estates (Rugalema *et al*, 1998).

Apart from productivity losses, firms face medical and funeral costs upfront, with serious effects on profits. Data obtained from company clinics in the sugar belt of western Kenya show that medical expenses have increased 10-fold in the last 10 years due to increasing number of AIDS cases (IEA/SID, 2001). Employers spend an average Ksh 45,000 in funeral costs for each deceased employee. In addition, about 6 other employees get leave and transport to attend the funeral (IEA/SID, 2001).

A study of some Kenyan firms (IEA/SID, 2001) showed that AIDS could increase labour costs by 15% by 2005; on average, the annual costs due to AIDS could reach Ksh 4.3 million per business. The effect of AIDS on small firms and informal firms has not been studied, but it is not impossible to predict. Sole proprietorship firms are likely to simply collapse with infection and eventual progression to death of the owner.

Individuals and households

For married women, inheritance patterns, economic subordination and the absence of restraint on the number of sexual partners a man may have all weaken marriage as a protective institution against HIV transmission (NACC, 2002). While these dimensions of gender inequity are recognized as factors in sustaining the epidemic, many responses

to AIDS do not adequately address unequal power relations that increase women's vulnerability, nor have there been studies to explore the special impact on men.

The problem of AIDS orphans clearly stands out as a major consequence of the increased AIDS cases in households. The number of AIDS orphans grew from an estimated 300,000 in 1995 to 700,000 in 1999 (IEA/SID, 2001). This was expected to rise to more than 1.5 million by 2002. The problems faced by these children mimic a vicious circle going beyond the challenges of household headship to child labour, lost education opportunities, poverty and the likelihood of engaging in risky sexual behaviour and crime (Steinberg *et al*, 2000).

In traditional family settings, AIDS orphans are cared for by members of the extended family or the elderly. But the magnitude of the AIDS problem has overwhelmed these structures in some parts of the country (NASCO, 1999). In 1994 an assessment by Plan International, Embu branch (KIE, 1997), demonstrated that caring for orphans was already a burden in many families. In general, deaths caused by AIDS have led to dissolution of some households in parts of Western Kenya.

Population size

Using various demographic models, it has been predicted that AIDS will slow the rate of population growth in Kenya by approximately one percentage point by 2005. However, the population is expected to grow by 1.3% by 2005. It should be noted that changes in the total fertility rate will have a greater impact on the population growth rate than would AIDS deaths (FHI/AIDSCAP, 1996). In a 'no-AIDS' scenario, the total population would increase from 29 million in 1996 to 37 million by 2005. With AIDS, the population is expected to reach 34 million by 2005.

Macroeconomic impact

HIV has greater economic impact than other endemic diseases such as malaria because it primarily affects adults in their most productive years. There are many channels through which AIDS affects macro indicators such as GDP per capita, economic growth and level of investment, but the main channel is through reduced labour productivity as a result of absenteeism and loss of experienced workers, possible changes in labour supply and demand, reduced industry profits, and falling domestic savings. Further, since the wealthier owners of capital and the more skilled and better educated subsets of the population have higher levels of consumption and investment, command higher wages and are more likely to be employers, AIDS is likely to have a great negative impact on the Kenyan economy.

Using a 'macro AIDS'¹¹ model, the total cost of AIDS to the country as a whole was projected to reach Ksh 4.1 billion in 2000 and Ksh 5.5 billion by 2005 (FHI/ AIDSCAP, 1996). This is expected to reduce Kenya's GDP by 14.5% within the next 10 years from levels expected if there were no AIDS. At the same time, per capita income is projected to drop by 10%. In other words, the economy will not only lose valuable members of its workforce but will also witness diminished resources available to the survivors.

2.3 Government response to the AIDS epidemic

Recognising the seriousness of AIDS, the Government of Kenya has come up with various policy initiatives to stem the scourge. The Sessional Paper No. 4 of 1997 on AIDS in Kenya (GoK, 1997) recognised the main response measures by the government as the establishment of

¹¹ Adopted from that developed by Cuddington, J. and J. Huncocock, 1994.

the National AIDS Committee and the development of strategic plans to deal with the scourge. Initially, the government established the AIDS Programme Secretariat (APS) in 1985, which became the Kenya National AIDS Control Programme in 1987. The 1987-1991 national medium term plan emphasised the need for creation of awareness about AIDS, blood safety, clinical management of AIDS and capacity building for the management of AIDS control programmes at the national level. The second medium term plan (1992-1996) stressed the need to involve all sectors in HIV prevention in order to mobilise broader national response against the epidemic (GoK, 1997). Also, Kenya's Health Policy Framework identified five goals in the fight against the spread of AIDS (GoK, 1994):

- Prevention of HIV infection through information campaigns;
- Prevention of transmission through blood by effectively screening blood;
- Prevention of perinatal transmission;
- Healthcare, counselling and social support for AIDS patients; and
- National coordination and mobilization of funds to cope with the disease.

The government went further to recognise AIDS as a development issue. This led to AIDS issues being incorporated into the Seventh National Development Plan, the Fifth District Development Plans and other succeeding policy documents. In 1999 the government declared AIDS pandemic a national disaster. This allowed more government spending and involvement in its fight, while creating opportunity for greater AIDS related donor funding. The government's response to the AIDS scourge also involved resource mobilization to finance control and treatment of AIDS-related opportunistic diseases. Apart from bilateral donors and the World Bank, non-governmental organizations have been in the forefront in providing financial support for the fight against HIV/AIDS.

The National Aids Control Council (NACC) in the Office of the President now coordinates AIDS prevention and control activities in the country, and is also the structure through which donor funds to fight AIDS are channelled (mainly funding from the Global Fund). NACC's National Strategic Plan has five priorities for the prevention and control of HIV/AIDS:

- Prevention and advocacy;
- Treatment, continuation of care and support;
- Mitigation of socioeconomic impacts;
- Monitoring, evaluation and research;
- Management and coordination.

The principle objective of the strategic plan is to stop the epidemic and reduce its impact on the Kenyan society and economy by lowering HIV prevalence in Kenya by 20 to 30% among people aged 15-24 years by 2005, increasing access to care and support for people infected and affected by HIV/AIDS, and strengthening response capacity and coordination at all levels (NACC, 2000).

The government has approved publication of the HIV/AIDS Prevention and Control Bill, 2003, which seeks:

- To regulate education and information on AIDS;
- Safe clinical practices and procedures;
- Regulations on screening, testing and access to healthcare;
- Regulations on confidentiality such as on disclosure of information and penalties for breach of confidentiality;
- Stemming discrimination in the workplace, schools and in provision of services to HIV/AIDS people;
- Regulations on AIDS research.

In 2001 the government published a National Condom Policy and Strategy (GoK, 2001c) whose purpose was to improve access to affordable quality condoms. This also includes effective assessment of condom demand, social marketing of condoms and raising of funds to finance condom supply and distribution. The targeted groups include the youth, mothers attending antenatal and other mothers, commercial sex workers, people living with HIV/AIDS and people who frequent bars and drinking places.

With regard to gender aspects of the HIV/AIDS epidemic, the government has published a strategic plan on mainstreaming gender into the Kenya National HIV/AIDS Strategic Plan, 2000-2005. This takes into account most concerns that are gender specific in the exposure to AIDS and response mechanisms. This approach aims to empower women and remove gender inequality at all levels of anti-AIDS programmes (NACC, 2002).

Through these activities, the government has registered several achievements, particularly in establishing systems to stem the steep rise of the disease and in alleviating suffering of AIDS patients through provision of medication.

Another important segment of AIDS intervention involves workplace programmes and practices. The most common prevention activity is education through distribution of reading materials, discussions on AIDS, presentations and peer education programmes. Out of 16 companies surveyed in 1994 (FHI/AIDSCAP, 1996), 11 offered some form of AIDS education and 94% of them provided condoms. Some offered education, and STD testing and treatment, and others counselling services. A few of them encouraged voluntary HIV testing.

2.4 Experience of other countries with HIV/AIDS

Uganda

Now considered one of the world's earliest and best success stories in overcoming HIV, Uganda has experienced substantial declines in HIV/AIDS prevalence and incidence during the past decade. According to Uganda's Ministry of Health data, seroprevalence among 15-19-year-old pregnant women, which is believed to reflect HIV incidence, fell sharply from the early 1990s to around 1996 and has remained low (Marum and Madraa 1999). Estimates show that national HIV prevalence peaked at around 15% in 1991, and had fallen to 5% by 2001. This dramatic decline is unique worldwide, and has been the subject of curiosity since the mid 1990s and recent and intense scientific scrutiny.

Uganda's HIV prevalence has been observed over time and across different geographic and demographic populations. Uganda's falling HIV prevalence is likely to be associated mainly with a number of behavioural changes. Changes in age of first sexual encounter, declining casual and commercial sex trends, partner reduction and condom use all appear to have played key roles in the decline. Although HIV knowledge, risk perception and risk avoidance options can ultimately lead to reduced HIV incidence, there is a complex set of epidemiological, sociocultural, political and other factors that are likely to affect the course of the epidemic in Uganda.

High-level political support with multi-sectoral participation set the tone for the fight against HIV/AIDS. In 1986, Uganda's new head of state, Yoweri Museveni, responded to the epidemic with a proactive commitment to prevention, emphasizing that fighting AIDS was a patriotic duty requiring openness, communication and strong leadership from the village level to the state house. In 1992, the multi-sectoral

Uganda AIDS Commission (UAC) was created to coordinate and monitor implementation of the national AIDS strategy. The UAC prepared a National Operational Plan to guide implementing agencies, sponsored task forces and encouraged the establishment of AIDS control programmes in other ministries including Defence, Education, Gender and Social Affairs. By year 2001 there were at least 700 governmental and non-governmental agencies working on HIV/AIDS issues across all districts in Uganda.

In 1986 Uganda established a national AIDS control programme (ACP), which launched an aggressive public media campaign that included print materials, radio, billboards and community mobilization for a grassroots offensive against HIV. The ACP became the STD/AIDS Control Programme in 1994 and has since trained thousands of community-based AIDS counsellors, health educators, peer educators and other types of specialists. Spreading the word involved not just information and education but also emphasis on fundamental behaviour change-based approach to communication and motivation. Decentralization was actually a type of local empowerment process that involved local allocation of resources – in itself a motivating force (Green, 2002).

Since 1989 Ugandan teachers have been trained to integrate HIV education and sexual behaviour change messages into curricula. At the same time the government has been working to empower women and the youth by allowing them more political voice. In addition, since 1988 respect and protection of the rights of those infected by HIV have been inspired by a number of prominent Ugandan citizens and by public events such as candlelight memorials and observance of the World AIDS Day. The AIDS Support Organization (TASO) was established in 1987, and has worked in advocacy against discrimination and stigmatization while pioneering a community-based approach to the care of people living with HIV/AIDS.

Religious leaders and faith-based organizations have been active in the frontlines of the response to the epidemic. Mission hospitals were among the first to develop AIDS care and support programmes in Uganda. In 1990, the Islamic Medical Association of Uganda piloted an AIDS education project in rural Muslim communities that evolved into a larger effort to train local religious leaders and lay community workers. The Protestant Church of Uganda organized a workshop for bishops and other religious leaders in 1991, and implemented an extensive AIDS education project in many of its dioceses. The Catholic Church and mission hospitals provided leadership in designing mobile home care projects for AIDS victims and special programmes for AIDS widows and orphans.

Uganda was the first country in Africa to launch confidential VCT services. In 1990, the first AIDS Information Centre (AIC) for anonymous VCT opened in Kampala. By 1993, AIC was active in four major urban areas as more and more people became interested in knowing their serostatus. AIC pioneered in providing same-day results using rapid HIV tests, and the concept of 'post test clubs' to provide long-term support for behaviour change to all those tested, regardless of their serostatus.

In demographic health surveys, the 'ever use' of condoms as reported by women increased from 1% in 1989 to 6% in 1995 and 16% in year 2000. For males, this was 16% in 1995 and 40% in year 2000. Modelling suggests that very high levels of *consistent* condom use would be necessary to achieve significant reductions of prevalence in a generalized-level epidemic (Stover, 2002).

The most important determinant in the reduction of HIV incidence in Uganda appears to be the decrease in sex partners and networks. In general, Ugandans now have considerably fewer non-regular sex partners across all ages. Population-level sexual behaviour, including

the proportion of people reporting more than one partner in Kenya (1998), Zambia (1996) and Malawi (1996), for example, appears comparable to that reported in Uganda in 1988-1989.

The experience of Uganda suggests that a comprehensive behaviour change-based strategy ideally involving high level political commitment and with a diverse spectrum of community-based participation may be the most effective prevention approach.

Thailand: the Phayao experience¹²

Phayao is a relatively small province in Thailand. Its main source of income is agriculture, employing 44% of the workforce. The main crop grown is rice. Low household incomes forced men to migrate in search of employment leaving women behind. For women, one common option was commercial sex work. HIV spread gradually since the late 1980s turning Phayao Province the region with the highest reported AIDS cases in Thailand. By 1994, AIDS, representing 11.3% of all deaths, had become the leading cause of mortality in the province. The population growth rate declined to almost zero.

The Phayao people countered HIV individually and collectively, mainly through sexual behaviour change. Previously, the Phayao people considered commercial sex as normal, and young men normally had their first sex experience with a prostitute. This changed dramatically when they came to understand that AIDS is a killer. For example, in 1990 there were 78 commercial sex establishments in Phayao with 449 commercial sex workers; these had dropped to 12 and 76, respectively, by 1996. Also, condom use by male sex clients rose in most of the brothels.

¹²This section borrows from UNAIDS (2000).

Attitudes towards people with HIV/AIDS also changed from fear to compassion. Adjustments were made to customs and lifestyles to accommodate people living with HIV/AIDS. For example, infected people were invited to participate in social events and to help in non food-related chores. Twenty-four groups of people with HIV/AIDS were established in Phayao with 1609 people. In addition, people started dealing with the factors that made them vulnerable to HIV. Rather than sending their daughters to town to make money, they started keeping them in school with the help of the education ministry.

The government and NGOs also got involved. When HIV was first detected in Thailand, the government appointed the sexually transmitted diseases (STD) clinics as the main agencies to deal with the new disease. They were put in charge of a prevention campaign focusing on risk groups, mainly sex workers and their clients. In 1991, the government created the National AIDS Prevention and Control Committee (NAPCC) chaired by the prime minister. At the end of that year, the NAPCC launched the '100% condom use campaign' for commercial sex establishments. The government has provided strong media support for this campaign and also organizes condom distribution.

From 1993 to 1996, the response to HIV/AIDS by Phayao institutions steadily increased in intensity. In 1996, public and private institutions in the province started 75 projects aimed at reducing HIV risk and building capacity for dealing with HIV/AIDS. Many sectors were involved in the projects, particularly at district level. Project funding came mainly from the Ministry of Public Health. The projects benefited many categories of people in Phayao.

3. Theoretical Issues and Empirical evidence

Studies on the impact of HIV/AIDS may be either at the macro or micro level. At the macro level, HIV/AIDS affects growth through its impact on macro variables such as interest rates and investment flows; physical, human and social capital; and fiscal and revenue factors. Micro-level economic effects are felt through reduction in household savings and lowered labour incomes. Conversely, reduction in economic growth may help fuel the pandemic. The direction of the impact of these factors on the pandemic is largely an empirical issue yet to be resolved.

We start by looking at the micro impact aspects of the scourge together with some empirical evidence on the health and agricultural sectors, households and household economies, industry and population.

3.1 Micro- and meso-level effects

Industry and labour force

The main costs from the perspective of the firm may be classified as direct or indirect costs. The direct costs include: 1) loss of hours of work and specialised labour such as managers, entrepreneurs or those with special modern technical skills, and 2) increased medical, insurance and funeral costs (Steinberg *et al*, 2000). The indirect costs pertain to increased cost emanating from: 1) absenteeism due to illness or funeral attendance, 2) provision of care to the ill, 3) lost skills, 4) training and recruitment, 5) reduced work performance, and 6) lower productivity.

Other factors influencing costs include the risk profile of the employees, risk modification expenses of firms, and the degree to which work processes are planned to accommodate people infected with HIV. For most enterprises, costs associated with HIV/AIDS among employees

are unlikely to be devastating in any one year but can be substantial over time and may affect international competitiveness in particular. Illness or death of owners or key managers may be disastrous in some firms. Small and medium-size enterprises reliant on local skilled people are probably particularly susceptible.

Vulnerability to HIV/AIDS varies depending on factors such as type of company and production processes. Labour-intensive firms may appear to be at higher risk of lost production. The impact depends on the ease with which employees can be substituted (Steinberg *et al*, 2000). High-skill, labour-intensive industries such as those in education find it very costly to retrain replacement staff, but low-skill industries such as commercial cleaning can replace staff easily. Enterprises that offer comprehensive benefits to employees are bound to suffer increased costs as a result of AIDS.

The impact of AIDS extends to the marketing of goods and services. Vulnerability of particular markets generally depends on the nature of the good or service and the demographic and risk profiles of the consumers. Certain markets, such as those providing private healthcare services actually benefit from the epidemic.

Various studies (Steinberg *et al*, 2000; Morris *et al*, 2000; FHI/AIDSCAP, 1996) have shown evidence of possible detrimental effects of AIDS on industry. Steinberg *et al* (2000) observes that the impact on business would vary depending on the type and the production processes. The labour-intensive firms will lose if labour lost is not easily substitutable, while capital-intensive firms will suffer if they lose specialised labourers. Practically, the costs of the disease on the firm may be felt over the long term, affecting both domestic and international competitiveness of the firm. In a study in South Africa, Morris *et al* (2000) assessed the economic impact of HIV infection in a cohort of rural agricultural workers from the perspective of industry. The study found that HIV/AIDS seemed

to affect mostly people in the lower wage band, contradicting other studies that show all workers are infected equally.

Impact on consumption spending

The main impact on consumption is likely to be in distributional terms. This means that more income may go to treatment of AIDS-related illness, while demand for luxury goods with high-income elasticities will suffer. Therefore, the effect of AIDS depends on the extent to which it depletes a household's wealth and income base. There is general agreement that the poor are hardest hit, and it is possible that AIDS will increase the number of people below the poverty line. The sum effect is lower consumer purchasing power, which will affect aggregate demand. Other effects will be on banks and other lenders of credit. The risk on loans is likely to be higher, which may have the effect of increases in bank lending interest rates, leading to greater credit rationing and, in effect, lower investment (Steinberg *et al*, 2000).

Agriculture

AIDS affects agriculture in as far as the poor and those mostly affected depend on agriculture. It causes diversion of labour to the care (homecare) of the sick or the total loss of farm labour, with the net effect of lowering agricultural production and increasing food insecurity. In general HIV/AIDS reduces food availability by lowering production; reducing family labour, land and other resources allocated to agriculture; and reducing livestock assets and implements. It also affects food acreage and the stability and quality of food supplies as farmers shift to less labour intensive production (Rugalema *et al*, 1998).

Illness and death can disrupt the farming cycle and reduce the ability of households to produce and buy food. Sale of assets and weakened

social networks leave households vulnerable to production losses. With lost labour, nutritional leafy crops and fruits may be replaced with starchy root crops, such as cassava and maize, while livestock losses reduce both manure and food supplies such as milk. AIDS also causes farms to switch from export to food crops, with implications for export earnings. Also, fertile land belonging to families hard hit by the epidemic may remain idle due to labour shortage. In the late 1980s in Uganda people reduced their work on coffee, which required pruning and marketing, in favour of their staple bananas. They then cut down labour on bananas and vegetables and concentrated on easily cultivated, easily stored and starchy cassava. This shift to lower quality foods is associated with chronic food insecurity, high levels of protein-energy malnutrition and deficiencies in micronutrients such as iron, zinc and vitamins. This further undermines the nutritional requirements of AIDS sufferers to fight opportunistic infections and prolong survival (Loenwenson and Whiteside, 2001).

Labour losses due to AIDS deaths have led to significant productivity losses in much of Africa. In Ethiopia, for example, labour losses due to AIDS reduced time spent on agriculture from 33.6 hours to 11.6 hours per week. In Zimbabwe AIDS led to declines in maize outputs of 61%; for death from other causes this was 45% (Loenwenson and Whiteside, 2001).

Impact on households and household economies

The initial impacts of HIV/AIDS on the household pertain to loss of insurance and medical benefits, increases in medical and other costs, and loss of the ability to work once one develops full-blown AIDS. This means that ailing family members, who are usually at their most productive age, become more dependent on the elderly or young uninfected members of the household.

Death in the household from AIDS can have profound implications for resource allocation, production, consumption, savings, investment and the well-being of survivors (Steinberg *et al*, 2000; Arndt and Lewis, 2000). AIDS comes with disruption of normal social relationships within the family. This refers to the breakdown of usual relationships and support systems, especially when the head or key members of the household die. The threat of poverty becomes real as medical bills lead to a depletion of income and savings. The survivors may be left with little income to spend or wealth to inherit.

The costs to a household with an AIDS patient can be divided into three components: direct costs associated with medical expenses, indirect costs of foregone earnings, and indirect costs to other households who contribute to funeral expenses and care for the orphaned children.

Studies in Côte d'Ivoire, Burundi and Haiti (UNAIDS, 1995) identified socioeconomic impacts of AIDS that included cessation of paid employment, increased borrowing, sale of possessions, low levels of seeking care even when care was available, and ostracism and discrimination of those affected by the disease. In Tanzania, India and Thailand, the immediate impacts of AIDS were a noticeable drop in income, an increase in debt and mortgaging, withdrawal of children from school, early entry of children into the labour market, continued presence of older household members in the labour market, and effects on the form and patterns of employment of care providers.

Contrary to common expectation, a study by Bertozzi and Aggleton (1995) found that based on aggregate data, there was no direct link between HIV/AIDS and poverty. But Arndt and Lewis (2000) found in Botswana that: 1) a quarter of all households would lose income for over a decade as a result of death from AIDS of an income-earning member, 2) there would be tremendous increase in the number of families without income, and 3) the epidemic would cause a decrease

of between 8 and 10% in household per capita income over the next 10 years. Though income inequality was unlikely to be affected by AIDS, the percentage of people living in poverty is likely to increase by between 4-6% as a result of AIDS. We should, however, note that the number of poor people would in fact be much higher if the poverty line was redefined to take into account the preservation of life itself as a basic need. This would require us to factor in the total cost of HIV treatment.

Another factor in the impact of AIDS is the ability of households to cope with the disease, the key channels available for insurance from risk and sources of assistance or credit. Research has shown that vulnerability to shocks varies among households, and this may significantly affect the path of development and distribution of welfare (Lundberg *et al*, 2000). Households respond in various ways to shocks such as an AIDS shock. Wealthier households seem to be better insured than the poorer households against shocks, owing to their access to credit and richness in social capital, i.e. they have a larger, broader and presumably wealthier network of friends and relatives on whom they depend in times of crisis. Poor households normally tend to rely on private transfers rather than on credit.

A bereaved family may cope with economic shocks caused by death by 1) seeking financial assistance from friends and relatives, or a formal government or NGO agency, 2) changing the mix of crops grown on the family plot, 3) altering members' time allocation between labour market participation and work at home or school, 4) selling assets, 5) recruiting or shedding household members, or 6) reducing consumption of some or all household members. Research shows (Lundberg *et al*, 2000) that households that suffer an AIDS death receive more net private transfers and assistance from NGOs and the government than do households that have not suffered such a calamity; but the difference is not significant (Lundberg *et al*, 2000).

Private transfers provide by far the greatest assistance, but not all households rely on them (Lundberg *et al*, 2000). The dependence of some households on assistance from public institutions and NGOs could crowd out private assistance. Estimates of this crowding-out effect range from negative one-for-one to positive, where public assistance actually stimulates private transfers. In the long run, the ability of a household to cope with an AIDS shock diminishes as the 'autocorrelation' in shocks rises or as the shock is repeated over time. This indicates that households with repeated AIDS attacks have the least ability to cope.¹³

Impact on health sector

The AIDS epidemic has increased the demand for public health about seven times in most African countries, doubling bed occupancy rates and crowding out the needs for other health conditions. The annual direct costs for AIDS (excluding antiretroviral therapy) is estimated at about \$30 per capita, while most African countries spend less than \$10. Inadequate resources for AIDS have put health systems under pressure, eroding the quality of care (Loenwenson and Whiteside, 2001). The health sector workers may obtain infection in the line of duty as they come into contact with infected patients. They are also stressed up in cases where health centres are poorly funded due to the magnitude of the epidemic.

But there is also a possibility that non-AIDS related health spending might be declining as a result of demographic changes (Steinberg *et al*, 2000). For example, early in the epidemic, a decrease in the number of women of child bearing age will lead to a decrease in pregnancy and birth related expenditure, and also due to the number of old people

¹³ In a well-established epidemic, households may learn from experience or from other affected households to insure from frequent AIDS deaths.

entering old age. Therefore, as the HIV related expenditure (on antiretroviral, bed occupancy, etc) rises, the non-HIV related expenditure would be declining.

Education system

AIDS affects both the availability and use of schooling in terms of the number of children enrolled in school and the number of teachers and education officials (Loenwenson and Whiteside 2001). School-age children are forced to take care of their sick parents or relatives, and most cannot afford fees, lack parental care and face hunger and emotional stress. The situation is particularly bad for AIDS orphans and HIV-positive children.

Studies in Guatemala show that more than a third of children orphaned by HIV/AIDS drop out of school (Loenwenson and Whiteside, 2001). The World Bank estimates that by year 2020, Tanzania will have lost some 27,000 teachers to the disease, and their replacement will cost USD 37.8 million (World Bank 1992). UNICEF estimates that 860,000 children in Africa have already lost their teachers to HIV/AIDS (Loenwenson and Whiteside, 2001). In Botswana, death rates among primary school teachers rose from 0.7 per 1000 in 1994 to 7.1 in 1999 (Loenwenson and Whiteside, 2001). At the same time, the total population paying for education will increase more slowly than in a no-AIDS scenario.

3.2 Macro-level effects

Although some studies (Nicholls *et al*, 2000; Bonnel, 2000; Arndt and Lewis, 2000) posit that the economic cost of AIDS at the macro level will be great, more conservative research shows that the actual impact of HIV will be small, not catastrophic (World Bank, 1997)¹⁴. However,

¹⁴ The World Bank (1997) report on confronting AIDS contains a sub-section entitled "AIDS has little net macroeconomic impact".

there is general agreement that the socio-economic cost will be big. This is in terms of loss of life, family dissolution and crime increase, among other costs. The pandemic has been seen to have effects on macro variables such as physical, human and social capital.

HIV/AIDS also affects the macro outcomes through its effect on fiscal deficits (Bonnell 2000; Arndt and Lewis, 2000). This is through increasing government health expenditure on its own employees and on the public health budget. All these worsen the fiscal deficit of a country and reduce domestic savings. This will most often be the case in a developing country such as Kenya, which cannot offset such deficits through cutting expenditure or raising taxes. Note also that as production falls, or as shifts occur in the private sector due to HIV/AIDS, the government revenue base, especially the VAT and corporate taxes, and trade taxes will also be affected negatively. AIDS forces households to deplete their assets and savings, which also affects government revenue collected through income taxes.

Whether savings rise or fall in affected households is ambiguous. Evidence shows that savings fall in the face of the disease (FHI/AIDSCAP, 1996; Bonnell, 2000; Arndt and Lewis, 2000). Household savings may fall due to death of adult family members and depletion of assets and savings. However, savings could increase in a well-established AIDS epidemic, where households are forced to save more in anticipation of increased spending when AIDS infection strikes, or if HIV/AIDS leads to rise in per capita income. This may only happen where skilled labour is in short supply.

Generally, evidence (FHI/AIDSCAP, 1996; Arndt and Lewis, 2000; Nicholls *et al*, 2000; Bonnell, 2000) shows that an HIV/AIDS epidemic would cause a fall in savings. The combined effect of decreased domestic savings is lower investment, assuming that there is not enough external financing to offset the fiscal deficit. Initially HIV/AIDS has negligible

effect on physical capital, but over time, as the epidemic takes its toll, the reduction in domestic savings affects investment. Physical capital is also affected through worsening fiscal deficit resulting from increased health expenditure on AIDS and related illnesses, pension payments for AIDS-related deaths of civil servants, and training of new employees. This affects the government's ability to invest.

The impact of HIV/AIDS on human capital is stronger in the short term than in the long term. The initial effect of HIV/AIDS is to destroy human capital, affecting both the high and low-income groups. In the long term, the high income groups can lower their susceptibility to AIDS through larger investment on prevention of the scourge. The initial decline in labour supply associated with AIDS infection leads to increase in return to skilled labour and in wages for skilled labour (if there is no surplus labour). This may not work in countries like Kenya with excess labour). To the extent that the wages of skilled labour rise relative to those of unskilled labour, the return to schooling would increase. This would be especially relevant for the youth who are not yet HIV positive. So far, available evidence (Bonnell, 2000) suggests that formal education is adversely affected by HIV epidemic.

Social capital has emerged as an important determinant of growth. For example, Bonnell (2000) notes that trust and civic cooperation matter in economic growth. HIV affects the social structure of local communities and erodes existing social networks and traditional support systems. Other effects are increased insecurity, especially in terms of increased crime resulting from the increased numbers of orphans with no adult guardians or income sources (Bonnell, 2000).

HIV/AIDS generally worsens poverty at the macro level. A study in Botswana (Greener *et al*, 2000), for example, showed that about 26% of poor households surveyed would lose their income as a result of death of an income earner, while small households would be wiped out over

a ten-year period because all of the household members are infected (Greener *et al*, 2000). Generally, poverty levels would increase and per capita incomes would decline by 10% over the next 10 years. Though it is widely agreed that HIV/AIDS would generate a fall in output, the impact on per capita incomes is indeterminate *ex ante* (Bonnel, 2000). Early analysis of impact of HIV/AIDS on per capita incomes in Botswana (Greener *et al*, 2000) show that the epidemic could increase per capita income as population declined. However, evidence generally shows that increased public and private AIDS-related health expenditure would lower the stock of capital in many African countries through a fall in investment, caused by a fall in domestic savings. This in effect lowers per capita incomes. Botswana, whose per capita incomes may increase due to the big national savings and dependence on diamonds for export, would be an exception in this case.

Cross-country studies confirm the negative effects of HIV/AIDS on economic GDP and average growth rate per capita (Bonnel, 2000). It has been found that had the HIV prevalence not reached 8.6% in 1999, Africa's income per capita would have grown at 1.1% per year. In the case of sub-Saharan Africa, for a nation with a prevalence rate of 20%, the rate of GDP growth over 20 years would be 67% less than would have otherwise (Bonnel, 2000). Nicholls *et al* (2000) show that in Trinidad, Tobago and Jamaica, a sustained increase of 20% in the number of people infected between 1997 and 2005 would lead to contractions in GDP of between 4.2 and 6.4%, and AIDS may slow down capital accumulation, assuming that investment is financed from domestic savings, health spending is drawn from domestic savings and there are no external grants. Normally, the effects of AIDS are likely to be felt over time in terms of reduced rate of accumulation of knowledge (in terms of reduced total factor productivity) and falling rate of accumulation of capital through erosion of human capital and switching of domestic savings to

finance current health spending (Nicholls *et al*, 2000; Arndt and Lewis, 2000).

Most of the studies have also focused on the effect of AIDS on certain sectors, the fiscal position and demographic outcomes. Using a computable general equilibrium model and incorporating the impact of AIDS, comparison was made of a hypothetical 'no-AIDS scenario' to a more likely 'AIDS scenario', and the decomposed model was used to determine the factors that contributed to the different growth levels. Using this kind of modelling, real GDP was about 17% below the level attained in the no-AIDS scenario. However, the differential or the size of GDP as a measure of economic welfare may not be satisfactory, because it may not be an adequate measure of welfare in the context of an epidemic that lowers the average life expectancy by 20 years (Arndt and Lewis, 2000).

Many of the predictions on the impact of AIDS on the economy differ greatly in methodologies chosen and assumptions used. Many aspects of the direction the impact will possibly take are not clear, but there is agreement that AIDS bears heavily on the economy in the short and long term.

4. AIDS Research Methodologies in Economics

Macro growth models

Macro modelling of the impact of AIDS on the economy was pioneered by Cuddington and Huncock (FHI/AIDSCAP, 1996). The macro model they developed has been used to assess the impact of HIV/AIDS on the economies of Tanzania, Zambia and Malawi, a modified version in Kenya (FHI/AIDSCAP, 1996). The model makes projections of some economic indicators based on time series data of economic performance with AIDS epidemic. The projections made, based on the assumption of the presence of AIDS, are compared with those made under the assumption of its absence. Past information on the economic performance before the AIDS epidemic is required to make projections.

The series data used to build an AIDS scenario for Kenya spanned nine years, from 1985 to 1993, when interventions on AIDS were still rudimentary and prevalence rates low, and would not be adequate to justify projections to 2010. This model is good for predictions used to bring attention to possible effects of the AIDS scourge but would be unrealistic in attributing real economic costs, since the model is based on many strong assumptions.

The impact of HIV/AIDS can also be estimated using a growth model with the prevalence rate of HIV as an explanatory variable. Though a biased estimate of the impact of HIV on the economy, GDP per capita over time is usually used. The per capita GDP neglects the welfare of those who have died of the scourge. In modelling the impact of AIDS on the economy, it is important to take into account identification problems. It is unclear whether HIV affects growth or growth affects HIV. A plausible solution to the identification problem is to use various equations to address various interactions. Bonnel (2000) used three

equations in a cross-country study. One equation expressed growth as a function of macroeconomic policy ratings, institutional variables and other determinants of growth. Basically, the average rate of growth of GDP per capita was expressed as a function of initial per capita income of a country, level of infrastructure (per capita number of telephones) and index for legal framework, macro policy ratings for the country, human capital and other variables used for their significance in the model (such as malaria prevalence).

The second model expressed policy ratings as a function of initial macroeconomic ratings, natural logarithms of initial per capita income, infrastructure, and HIV prevalence and its square. In the third equation, the natural logarithm of prevalence rate of HIV/AIDS was expressed as a function of the main determinants of HIV/AIDS. These include infrastructure, average growth of GDP per capita, extent to which different (ethnic) languages are used, share of female labour in industry in 1990 (representing gender), share of receipts in exports in 1990 (representing migration), share of the Muslim population, malaria morbidity in 1990, number of years since the first HIV/AIDS case was reported, and secondary school enrolment in 1990. The OLS estimation procedure was used together with three stage least squares, which takes care of endogeneity problems (Bonnel, 2000).

Interesting as this approach may seem, data for a single country may limit to some extent the usage of endogenous growth models. However, assuming that time series data on HIV prevalence rates and per capita GDP were available, Bonnel (2000) defines the following specification:

$$G = f(H, H^2, HC, D, Z, LAW, M).....1$$

Where: G is the GDP per capita in year t , H is HIV prevalence in year t , H^2 is the square of HIV prevalence for year t , HC is the human capital stock in year t , LAW is a measure of the rule of law (proxied by the corruption index), M stands for sound fiscal and monetary policies (may

be proxied by the budget deficits or the rate of inflation), D is malaria prevalence, and Z are variables tested for their significance (these would include an index for the development of the financial system and dummies for civil unrest, among other variables).

Since HIV prevalence is suspected to be endogenous in the model, we may estimate it separately before using it as an explanatory variable in the model above. Covariates entering the HIV prevalence model were infrastructure per capita each year (e.g. number of phones per capita), a gender equality index, secondary school enrolment in year t , and number of years since the first case of HIV was reported for each year.

Experimental approaches: impact of HIV/AIDS on poverty and inequality

The impact of HIV on poverty levels may be investigated using an experimental survey where a random number, say 0 or 1, based on the prevalence rates, is assigned to an experimental sample (Greener *et al*, 2000). The simulated infection pattern should resemble the age, sex and geographical distribution of HIV/AIDS in the target population. Normally, data from sentinel surveillance would do. Using a predetermined poverty line and a hypothetical period within which an AIDS patient would die, the monetary costs of AIDS can be computed. This methodology also allows analysis of the expenditure and income effects. The poverty line can be adjusted to reflect additional medical and funeral expenses, therefore raising the likelihood that a family with an HIV/AIDS patient would be poor, and at the same time taking into account possible benefits across the whole sample of higher employment and higher wages for skilled workers with increased AIDS deaths (Greener *et al*, 2000). This method seems attractive in estimating the HIV/AIDS effects on institutions, specific districts or regions.

Economy-wide CGE models

A Computable General Equilibrium (CGE) model is based on a consistent and balanced social accounting matrix (SAM) that requires that key behavioural and accounting constraints and balance of payments equilibrium be maintained. These models are rich in sectoral and income distributional data. They are widely used to evaluate trade and fiscal policies affecting taxation and expenditure, since these have varying impacts on different productive sectors and income classes. They are underutilised even though they are best suited to analyse the economy, and are specially adapted to the economic analysis of the impact of AIDS. A CGE model can be used to simulate the impact of HIV/AIDS on all sectors of the economy. Arndt and Lewis (2000) have used a CGE model. The model assumed that HIV/AIDS spending is deficit-financed and net foreign savings are exogenously determined, and allowed for varying fixed and exchange rates to achieve external balance (Arndt and Lewis, 2000).

Production function approach

HIV/AIDS, just like malaria, reduces the amount of labour available to industry, therefore reducing output. AIDS mortality and morbidity affect production in firms owing to its effect on quantity and productivity of labour. For skilled labour or workers with special skills, the loss is significant because the cost and time involved in replacing such labour are high. The effect of HIV on household production, for instance, can be investigated using a production function.¹⁵ The effect of HIV/AIDS on production can be captured using a specification with HIV prevalence as an explanatory variable. The nature of the production function, whether Cobb Douglas or flexible type, should depend on our objective

¹⁵ See the draft paper on "Impact of malaria on crop production in Kenya" (2003), KIPPRA.

and data type (Berndt and Christensen, 1974; Douglas, 1976; Denny and Fuss, 1977).

Cost of illness approach

The cost of illness approach (COI) incorporates the direct and indirect costs of illness with direct costs consisting mainly of medical treatment costs, and indirect costs consisting of the value of productive time lost due to illness. Following Malaney (2000), the COI approach adapted for AIDS cost analysis would involve summing private medical costs, non-private medical costs or government spending on anti-AIDS treatment, labour loss due to mortality and morbidity, risk-related behaviour change costs, investment losses, and non-economic personal burden, which includes a costing of intangible losses occasioned by pain or suffering and other inconveniences due to AIDS.

The COI may also incorporate the value individuals attach to labour and the way households form their expectations about future illness costs (Cropper *et al*, 1998). Households may form their expectations by assuming that their future illness costs will exactly equal previous year's costs. This means that $COI = COI^*$. The alternative involves their looking beyond their experiences and calculating their chances of contracting HIV/AIDS using both the relative frequency of the disease in the population and the average COI. Consequently, the chance of an individual contracting the disease is the relative frequency of the disease in the sample. Note, however, that due to the stigma attached to AIDS the innate chance of infection could be overstated.

Willingness to pay approach

The willingness to pay (WTP) approach entails eliciting from households or individuals the amount they would like to pay for hypothetical

prevention or eradication of HIV/AIDS. One practical way of doing this is to carry out a survey on amounts individuals would pay for a hypothetical and effective AIDS vaccine.¹⁶ Such a study would need to be carried out in a place with high AIDS prevalence. A few caveats may suffice in an AIDS study as opposed to a study on malaria, for example. One, AIDS is stigmatised and, two, people do not like enquiries on their sexual behaviour, which they consider private. Therefore, the values that may be attached to preventive methods such as special condoms or a vaccine may be either highly understated or overstated, depending on individual opinion.

Another conceptual issue points to the possible aggregation of WTP across the population. This will not pass, owing to the shortcomings mentioned above and due to the reason that we cannot sum individual welfare functions to obtain a social welfare function. Further, values attached to prevention programmes (such as vaccines) may differ from values households would attach to total eradication of AIDS. Finally, implementation of COI and WTP approaches requires expensive survey data. Survey studies may also incorporate situational and impact assessment in certain sectors or among certain groups of people affected by AIDS.

Micro studies: Institutions and AIDS patients

We have extensively reviewed various constraints and problems industries and institutions such as schools, colleges and hospitals face due to HIV/AIDS. Worker absenteeism, medical and insurance costs, loss of experienced staff and funeral costs are some of the costs that firms deal with. This clearly means that most of these firms must be

¹⁶ This kind of study has been carried out to quantify the burden of malaria (Cropper *et al*, 1998). This study envisaged a hypothetical malaria vaccine and a bed net scenario in prevention of malaria in the sample survey.

taking direct or indirect steps to curb the impact of this disease. Key among such interventions are specific programmes for worker sensitization, provision of preventive materials to workers, among other mechanisms. Therefore, there is need to study what actually the top managers of various firms do about the scourge. Their opinions and intervention mechanisms may help in funding further AIDS control and prevention measures. A study may therefore be necessary to collect the views of management on the scourge and document different programmes that are in place, sources of funding, and the programmes' effectiveness and problems. This could be supplemented directly by, say, a workers' questionnaire module to elicit their opinions about the disease and their role in reducing its spread.

Such a study may not be complete without a module on those living with HIV/AIDS, who most likely are found in various homes or hospitals. This may help in understanding various problems these people undergo and in identifying ways of reducing the burden of the disease. Another important area of research is the economic burden from children orphaned by the disease and the economic and social cost of family break-up.

5. A Case for Further Research

From the research review we can surmise that studies on the economic impact of HIV/AIDS have focused on macroeconomic, household and industry levels. In Africa, macroeconomic impact studies have been carried out in Tanzania, Cameroon, Zambia and Kenya among other countries; household studies in Cote d'Ivoire, Uganda and Ethiopia (Arndt and Lewis, 2000), and industrial studies in Tanzania, Malawi, Zimbabwe, Zambia and Kenya. Though these studies are breakthroughs in AIDS impact research, their use of incomplete epidemiological data heavily affects their reliability in policy analysis.

Despite the large scale of the epidemic, data are scanty on the impact of the scourge at the individual, community and national level (Steinberg et al. 2000). This is associated with inherent difficulties in collecting complete and unbiased data owing to the nature of AIDS and the fact that anonymous sentinel surveillance data are used. Further, predictions regarding the impact of the epidemic are mainly based on the mathematical simulation models (such as the Doyle simulation model) that use sentinel surveillance data. These data are largely biased, since they exclude children and the elderly from the study, and the fact that they are collected from antenatal clinics indicates that they seldom capture the lower risks of men. Since women are at higher risk of getting infected with HIV than men, using antenatal clinics data implies that we are assuming that both men and women are at the same level of risk of getting HIV.

Owing to the nature of data available for AIDS research, most studies of the epidemic are rather speculative. Besides, precedent exists in health economics of studies of an epidemic of this magnitude. Nevertheless, given the inertia of the problem to subvert economic gains, sometimes hasty, theoretical or predictive studies are necessary insofar as far as they broaden our understanding of the problem and can help us plan.

Some salient factors point to the need for economic research on AIDS in Kenya. For instance, what are the main channels through which HIV/AIDS impacts on the economy in Kenya? How do we use the poor or non-representative data to make robust predictions of the economic and social cost or impact of HIV/AIDS on the economy? Given the prevailing HIV/AIDS situation and in the light of the current economic slowdown, what are the policy options for the government and the private sector to arrest the scourge and absorb the predictable and inevitable impacts of the disease? How will this be done in the light of unforeseen economic shocks or national or global crisis? What is the best policy mix, or what combination of programmes achieves the best outcomes in terms of minimized AIDS costs and reduced infections?

It is also important to understand the role of intergenerational aspects of the AIDS impact and stigmatization in the spread of the disease. Stigmatization may help fuel the scourge in addition to affecting the welfare of those affected. Therefore, it is could be worthwhile to estimate the economic benefit of eliminating stigmatization on reducing new infections, for example.

Intergenerational aspects refer to the impact of AIDS on a household and a community in the long term. The aftermath of AIDS will undoubtedly lead to increased number of orphaned children and poverty dynasties with depletion of household savings and death of key income earners. More research is needed focusing on the true loss to a household from an AIDS death at the present and across future generations. This should also include enquiries into household responses to the disease and how the scourge affects household consumption choices and saving preferences in both the short and the long term. The research should also note that each new infection places certain demand on current and future healthcare and social welfare

resources based on current estimates for the cost of treating an AIDS patient and cost of economic aid to such individuals, among other costs.

Studies on the impact of AIDS at the workplace and on firms need to take into consideration infection by skill or income class. This can help in implementing workplace interventions. Investigation of AIDS impact on the upper income classes, owners of capital and high-ranking managers, would be extremely valuable, owing to the importance of this class in investment and economic growth. Also, AIDS studies in Kenya may need to take into account the welfare impact on the individual and households. Nicholls *et al* (2000) for example suggest that further research should incorporate the welfare impact of the epidemic through a social welfare function.

Research on the macro impact of HIV/AIDS in Kenya is scanty. There is need, therefore, to assess the effect of the scourge on macro variables such as growth and interest rates, employment levels, physical and human capital and savings. These should be seen as different from sectoral or micro studies that focus on a particular industry such as agriculture, or on effect on households, individuals or AIDS patients. We note, however, that sectoral effects feed into macro impacts, which means that analysis always should be twofold: 1) analysis of the impact of AIDS at the 'local' level, for example at the household, community, individual, single-business, a particular industry, or an industry-group level, and 2) analysis of the sum of the individual impact on macro variables or indicators at the national level.

The literature reviewed in this study provides various approaches employed to model the impact of AIDS at the macro level. We have appraised the production function and WTP approaches to cost estimation, alongside economy-wide models and the growth equation approach. Sectoral and workplace studies serve to open up information

on the situation on the ground and inform on the best interventions necessary to curb the spread of AIDS. The impact of various anti-AIDS interventions also needs to be measured and justified.

6 Priorities and Policy Issues

In the shadow of the sustained AIDS problem in Kenya, the very important but two-pronged policy question is how the government can minimize cost of AIDS while reducing new infections. Programmes designed to reduce economic costs of AIDS cannot be de-linked from those that help reduce new infections. Both kinds are interlinked and reinforce each other. First, costs of AIDS may be reduced by taking steps to reduce labour losses (destruction of human capital) and therefore increase productivity. Since the greatest economic impact of AIDS is through destruction of human capital, efforts to offer life-prolonging treatment will reduce this loss and minimize total loss to the economy. Therefore, the economy can incur the costs of providing life-prolonging medication since the benefits in terms of human capital saved and other benefits are greater than the cost of the intervention. Other interventions targeted at cutting economic losses may include economic and food aid for the infected or affected, social support and retention of infected people in their jobs.

Efforts designed to reduce new infections mainly through prevention, awareness campaigns and VCT services should be intensified. Taking the test is a very important outcome of awareness and prevention campaigns, therefore the significant place that these campaigns (should) occupy in the war against AIDS. VCT services have gained prominence worldwide as a keystone for all anti-AIDS activities. Great benefits accrue from early diagnosis of HIV status, since those affected can promptly start taking life-prolonging ARVs and adopting other steps to improve their lives. For the government, VCT data are invaluable; they form a backbone for planning and spending on healthcare, and economic and social support for those affected. Most targeted AIDS interventions should be centred on the outcomes of correct data on

diagnosis of individuals in Kenya. Even awareness campaigns should be anchored on data from VCT services.

Policies and interventions that gravitate around and are informed by VCT services, however, may not be sustainable owing to the low number of people willing to be tested for HIV/AIDS. Therefore, there is need to promote testing through creating appropriate incentive mechanisms. This means incentives must be put in place to encourage obstinate people to know their HIV status. Primarily, the choice to take the test will depend on implications of the results of the test and incentives available to the individual.

Awareness campaigns, though indispensable, are likely to be widely accepted if they can show proof that VCT centres are accessible and that there is a clear support mechanism regardless of the test outcome. Adequate numbers of VCT centres and proper individual follow-up mechanisms after the test must be in place, providing services such as specific treatment regimes, care, social support assurances and legal protection for those testing positive, and means of and opportunities for prevention, random follow-up and aid to offset risky behaviour for those testing negative.

Although VCTs are the loci for HIV/AIDS interventions and campaigns, chances to obtain desired behavioural reaction, that is, deliberate choice to take a test, greatly depend on the incentives available. The incentives can broadly be categorized as economic, social support, treatment availability, prevention, and proper laws to protect HIV-positive people and test takers (HIV/AIDS Prevention and Control Bill, 2003).

Medical care should be top on the menu of incentives. The government should ensure that those who test positive receive appropriate life-prolonging medication and are treated for opportunistic infections. Economic support may include food and nutrition aid, job security and support to educate orphans. There should also be a way for ensuring

family or community support, including support for children and protection from domestic violence. Further, HIV-positive persons can be provided with protection to prevent their re-infection or infection of others. All these interventions could be coordinated by an integrated response centre that would hold databases on all positive tests, real and simulated, according to regions and that would allocate resources accordingly. Such a centre could be replicated at any administrative level including the village. The data may also be used for future economic impact programming. There should be clear and tangible mechanisms to help HIV-negative people to remain that way. This could include provision of prevention aids, counselling and a deliberate attempt to offset aspects that put them at risk. A risk factor such as unemployment or prostitution may be offset by employment creation, which itself is entrenched in the government's Economic Recovery Strategy paper.

These proposals are a logical organization of ideas and current practices that governments and NGOs espouse but that are so fragmented that a vibrant intervention system would not be discernible. Further, owing to the nature of the AIDS pandemic—that the epidemic is stigmatised and that most interventions tend to shake strongly held cultural and traditional values—programmes against AIDS must be well thought out. They must involve all stakeholders and be credible, until a point is reached where there is a sustained momentum nationwide to fight all aspects of AIDS.

Issues of governance and management of programmes need greater attention, particularly with regard to use of funds. Monitoring and evaluation systems and analysis of cost-effectiveness of anti-AIDS projects should be mainstreamed into national NGO or government intervention drives.

People who show compassion for those affected by the scourge—not opportunists and profiteers who infiltrate this humane war against AIDS—may also be allowed to run Anti-AIDS projects. There should be a system of vetting those who run such programmes, since their credibility influences the perception of the public, and especially those affected, of anti-AIDS messages and whether they support the projects, drives or strategies to fight the scourge.

The key inputs to what could be called a national anti-AIDS programme are:

- Data on early-diagnosis and a follow-up programmes, to allow for animation of case-specific interventions, with voluntary counselling and testing (VCT) forming the backbone for medical, economic and social support regimes;
- Collection of incidence and general prevalence data to serve as impact indicators and for impact analysis and long-term planning;
- Favourable and sustainable linkage of all awareness campaigns, VCT drives and follow-up strategies, treatment regimes and social and economic support programmes to the PRSP and the budgeting process (MTEF), with greater commitment of government allocations to these programmes rather than dependency on donor funding.

References

- Arndt C. and J.D. Lewis (2000). The macro implications of HIV/AIDS in South Africa: a preliminary assessment. *The South African Journal of Economics*, 68(5):856-887.
- Berndt E.R. and L.R. Christensen (1974). Testing for the existence of a consistent aggregate index of labour inputs. *The American Economic Review*, 64(3): 391-404.
- Bertozzi S.M. and P. Aggleton (1995). Report from a consultation on the socio-economic impact of HIV/AIDS on households, Chiang Mai, Thailand, 22-24 September 1995.
- Bonnel R. (2000). HIV/AIDS and economic growth: a global perspective. *The South African Journal of Economics*, 68(5): 820-855.
- Boseley S. (2003). Africa's deadliest battle: saving grace. *Africa Today*, 9 (5): 19-36.
- Cropper M., H. Mitiku, J. A. Lampietti, C. Poulos, and D. Whittington (1998). *The value of preventing malaria in Tembien, Ethiopia*. World Bank.
- Cuddington J. and J. Hancock (1994). "Assessing the impact of AIDS on the growth path of the Malawian economy". *Journal of Development Economics*, 43:363-368.
- Daily Nation (2001). AIDS campaign setback: many Kenyans stick to their sexual habits, says survey. 24 September 2001. Nairobi: Nation Media.
- Daily Nation (2003). New push for mass AIDS testing: compulsory HIV/ screening a good plan. *Horizon, Daily Nation*, 20 March 2003. Nairobi: Nation Media.
- Denny M. and M. Fuss (1977). The use of approximation analysis to test for separability and the existence of consistent aggregates. *The American Economic Review*, 67(3): 404-418.
- Douglas P.H. (1976). The Cobb-Douglas production function once again: its history, testing and some new empirical values. *Journal of Political Economy*, 84(5): 903-91.
- Family Health International/UNAIDS (2001). Effective prevention strategies in low prevalence settings. Family Health International, USA.
- Family Health International/AIDSCAP (1996). AIDS in Kenya: Socioeconomic impact and policy implications. Family Health International, USA.

- Forsythe, S., D. Sokal, L. Lux, T.D.N. King (1993). An assessment of the economic impact of AIDS in Kenya." Family Health International AIDSTECH/AIDSCAP.
- Forsythe, S., M. Roberts (1995). "The financial impact of HIV/ AIDS on Africa's commercial sector: A case study from Kenya." *AIDScaptions*, Vol. 2, No.1.
- GoK (Government of Kenya) (1994). *Kenya's health policy framework*. Nairobi: Government Printer.
- GoK (Government of Kenya) (1997). *Sessional Paper No. 4 of 1997 on AIDS in Kenya*. Nairobi: Ministry of Health.
- GoK (Government of Kenya) (2001a). *Economic Survey, 2001*. Nairobi: Government Printer.
- GoK (Government of Kenya) (2001c). *National condom policy and strategy*. Nairobi: Ministry of Health and National AIDS Control Council.
- GoK (Government of Kenya) (2003). *Economic Survey, 2003*. Nairobi: Government Printer.
- GoK (Government of Kenya)/UNICEF (2003). Multiple indicator cluster survey (MICS) Report, 2000. Nairobi: Central Bureau of Statistics and Ministry of Planning and National Development.
- Green E.C. (2002). What happened in Uganda? What are the lessons from Uganda for AIDS prevention? Presentation to USAID, Washington DC, 5 February 2002.
- Greener R., K. Jeffris and H. Siphambe (2000). The impact of HIV/ AIDS on poverty and inequality in Botswana. *The South African Journal of Economics*, 68(5): 888-915.
- IEA (Institute of Economic Affairs)/(SID) Society for International Development (2001). *Kenya at the crossroads: scenarios for our future*. Nairobi: IEA and SID.
- KIE (Kenya Institute of Education) (1997). "AIDS education for youth action programme" Facilitator's handbook, Nairobi: AIDS education project. Nairobi: Kenya Institute of Education.
- Leighton, C. (1993). "Economic and social impacts of the HIV/ AIDS epidemic in African and Asian settings: Case studies of Kenya and Thailand" Abt Associates.
- Lonwenson R. and A. Whiteside (2001). HIV/ AIDS: implications for poverty reduction. Background paper prepared for the UNDP for the General Assembly, Special Session on HIV/ AIDS, 25-27 June 2001.

- Lundberg M., M. Over and P. Mujinja (2000). Sources of financial assistance for households suffering and adult death in Kagera, Tanzania. *The South African Journal of Economics* 68(5):947-984.
- Malaney P. (2000). Microeconomic approaches to evaluating the burden of malaria. Cambridge, Mass.: Harvard University, Center for International Development. Mimeo.
- Marum E. and E. Madraa (1999). A decade of an effective national response to AIDS: a review of the Ugandan experience (Draft).
- Morris C. N., D. R. Burdge and E.J. Cheevers (2000). Economic impact of HIV infection in a cohort of male sugar mill workers in South Africa. *The South African Journal of Economics*, 68 (5): 933-946.
- NACC (National Aids Control Council) (2002). *Mainstreaming gender into the Kenya National HIV/AIDS Strategic Plan 2002-2005*. The Gender and HIV/AIDS Technical Sub-committee of the National AIDS Control Council.
- NACC (National Aids Control Council) (2000). *The Kenya National HIV/AIDS Strategic Plan 2000-2005*. Popular Version. Nairobi: NACC.
- Nalo D. and M. Aoko (1993). "Economic impact of AIDS in Kenya." Nairobi: Ministry of Planning and Development, Long Range Planning Division.
- NASCOP (1994): *AIDS in Kenya: background projections, impact, interventions, policy*. Nairobi: Ministry of Health.
- NASCOP (1998): *AIDS in Kenya: background projections, impact, interventions, policy*. Nairobi: Ministry of Health.
- NASCOP (1999): *AIDS in Kenya: background projections, impact, interventions, policy*. Nairobi: Ministry of Health.
- Nicholls S., R. Mc Lean, K. Theodore, R. Henry, B. Camara (2000). Modeling the macroeconomic impact of HIV/AIDS in the English speaking Caribbean. *The South African Journal of Economics* 68(5): 916-932.
- Rugalema G., S. Weigang and J. Mbwika (1998). HIV/AIDS and the commercial agricultural sector of Kenya: impact, vulnerability, susceptibility and coping strategies. Consultancy Report KE95/100. Rome: FAO.
- Steinberg M., A. Kinghorn, N. Soderlund, G. Schierhout, S. Conway, Abt Associates (2000). HIV/AIDS facts figures and the future: capacity of traditional coping mechanisms. SARH 2000.
- Stover J. (2002). The effects of behaviour change on trends in HIV incidence in Uganda and Kenya. Presentation to USAID, Washington DC, 5 February 2002.

- UNAIDS (2002). Epidemiological fact sheet: 2002 update Kenya. Geneva: UNAIDS.
- UNAIDS (2000). "HIV and healthcare reform in Phayao: From crisis to opportunity". Geneva: UNAIDS.
- UNAIDS (1995). Report from a consultation on the socio-economic impact of HIV/AIDS on households. UNAIDS.
- UNAIDS/WHO (2000). Epidemiological fact sheet on HIV/AIDS and sexually transmitted infections - Kenya. Geneva: UNAIDS.
- WHO (World Health Organization)/UNAIDS (2002). *Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections: Kenya*. Geneva: WHO.
- World Bank (1997). *Confronting AIDS: Public priorities in a global epidemic*. New York: Oxford University Press.

Appendix

Table A1: Estimated number of people living with HIV/AIDS worldwide, 2002

Region	Adults and children	Children (<15)	% women
Sub-Saharan Africa	29,400,000	2,800,000	58
East Asia and Pacific	1,200,000	4,000	24
Australia & New Zealand	15,000	<200	7
South and Southeast Asia	6,000,000	240,000	36
Eastern Europe and central Asia	1,200,000	15,000	27
Western Europe	570,000	5,000	25
North Africa and Middle East	550,000	40,000	55
North America	980,000	10,000	20
Caribbean	440,000	20,000	50
Latin America	1,500,000	45,000	30
Total	42,000,000	3,200,000	50

WHO/UNAIDS (2002)

Table A2: Estimated number of new infections and deaths from HIV/AIDS, 2002

Region	New HIV infections, 2002			Deaths from HIV/AIDS, 2002		
	Adults & children	Adults	Children (<15)	Adults & children	Adults	Children (<15)
Sub-Saharan Africa	3,500,000	2,700,000	720,000	2,400,000	1,800,000	550,000
East Asia and Pacific	270,000	270,000	3,000	45,000	43,000	2,000
Australia and New Zealand	500	500	<100	<100	<100	<100
South and South East Asia	700,000	640,000	60,000	440,000	400,000	43,000
Eastern Europe and central Asia	250,000	250,000	1,000	25,000	25,000	<100
Western Europe	30,000	30,000	<500	8,000	8,000	<100
North Africa and Middle East	83,000	70,000	13,000	37,000	30,000	6,800
North America	45,000	45,000	<500	15,000	15,000	<100
Caribbean	60,000	50,000	7,000	42,000	35,000	7,000
Latin America	150,000	140,000	10,000	60,000	55,000	5,000
Total	5,000,000	4,200,000	800,000	3,100,000	2,500,000	610,000

WHO/UNAIDS (2002)

Table A3: Regional distribution of HIV, 2002

Province	Urban		Rural		Total	
	Number	%	Number	%	Number	%
Central	32,113	7	204,383	14	236,496	12
Coast	61,509	13	71,771	5	133,280	7
Eastern	47,823	10	330,316	23	378,139	19
Nairobi	174,747	36	-	-	174,747	9
Northeastern	2,620	1	12,188	1	14,808	1
Nyanza	63,681	13	382,712	26	446,393	23
Rift Valley	80,989	17	285,431	19	366,419	19
Western	16,194	3	178,884	12	195,080	10
National	481,364	100	1,465,685	100	1,945,363	100

Source: Government of Kenya (2003)

Table A4: HIV prevalence rates among STI patients by sentinel year and marital status

Year	Monogamous	Polygamous	Separated	Single	Widowed
1990	13.9	0.0	34.5	15.3	16.7
1991	22.0	0.0	40.9	20.9	16.7
1992	28.9	0.0	41.7	29.8	50.0
1993	21.8	25.0	35.7	25.4	37.5
1994	25.7	13.9	28.6	28.4	42.9
1995	25.8	0.0	0.0	25.0	0.0
1996	21.5	30.9	20.7	20.2	50.0
1997	39.2	54.5	65.7	38.1	73.9
1998	30.9	48.8	68.8	23.0	50.0
1999	28.6	66.7	25.0	23.4	33.3
2000	31.2	54.0	40.0	30.1	68.2
2001	25.5	37.1	40.2	20.3	66.7

Source: Government of Kenya (2003)

Table A5: Percentage of men and women aware of methods of preventing HIV transmission, 2000

Category	Women				Men			
	Have one faithful uninfected partner	Use of a condom every time	Abstaining	Knows at least one way	Have one faithful uninfected partner	Use of a condom every time	Abstaining	Knows at least one way
Province								
Nairobi	78.6	61.6	78.4	85.7	86.0	62.7	86.7	91.7
Central	81.9	56.2	77.9	83.4	94.5	71.4	88.7	95.7
Coast	78.0	56.1	75.6	81.6	89.5	71.1	88.7	93.2
Eastern	81.8	46.9	77.6	84.6	93.2	65.7	87.0	95.4
Northeastern	53.2	29.0	51.6	53.7	75.4	38.7	71.5	76.9
Nyanza	77.4	45.7	70.9	84.5	89.1	62.2	82.2	95.7
Rift Valley	79.5	51.7	72.6	82.6	90.6	67.8	84.6	94.7
Western	76.0	49.9	71.7	81.4	85.6	69.6	81.3	91.1
Rural	79.0	49.6	73.6	82.9	90.7	66.8	84.5	94.3
Urban	78.7	59.0	77.6	84.4	86.9	65.4	87.4	92.3
Education								
None	68.0	39.3	63.9	71.9	83.6	59.9	78.5	88.3
Primary	78.5	50.8	73.3	83.2	88.7	66.2	83.5	92.7
Secondary+	85.9	62.2	83.6	89.9	93.0	68.8	90.0	97.4
Total	78.9	52.2	74.7	83.3	89.7	66.4	85.2	93.9

Source: Government of Kenya (2003); Government of Kenya/UNICEF (2003)

Table A6: Percentage of women and men who know of prevention method, a place to take a test and who have been tested

Category	Women					Men				
	Have one faithful uninfected partner	Use of a condom every time	Abstaining	Know a place to be tested	Have been tested	Have one faithful uninfected partner	Use of a condom every time	Abstaining	Know a place to be tested	Have been tested
Age										
15-19	70.7	47.3	66.6	50.3	4.8	80.0	62.6	75.1	56.8	2.0
20-24	80.1	57.8	76.7	65.9	10.9	87.6	68.5	84.2	75.7	4.7
25-29	83.3	57.7	78.1	73.5	14.2	91.7	73.8	86.5	80.8	10.2
30-34	80.6	52.6	77.0	69.6	15.7	93.4	71.4	88.7	84.0	12.9
35-39	80.5	48.4	76.0	65.0	9.7	94.8	63.2	89.0	85.7	9.6
40-44	82.0	52.5	77.5	59.8	10.7	94.8	69.1	91.9	84.5	10.0
45-49	79.2	38.9	73.5	62.4	5.5	90.1	62.1	88.6	79.4	11.6
Region										
Rural	79.0	49.6	73.6	59.8	5.7	90.7	66.8	84.5	73.8	5.7
Urban	78.7	59.0	77.6	73.9	23.1	86.9	65.4	87.4	83.2	15.4
Education										
None	68.0	39.3	63.9	47.4	6.3	83.6	59.9	78.5	64.5	8.7
Primary	78.5	50.8	73.3	60.8	8.1	88.7	66.2	83.5	72.5	5.2
Secondary+	85.9	62.2	83.6	78.5	17.6	93.0	68.8	90.0	85.6	12.9
Total	78.9	52.2	74.7	63.6	10.4	89.7	66.4	85.2	76.3	8.2

Source: Government of Kenya (2003); Government of Kenya/UNICEF (2003)

Table A7: Percentage of women and men reporting discriminatory behaviour against persons with HIV/AIDS, 2000

Category	Women		Men			
	Believe a teacher with HIV should not teach	Would not buy food from a person with HIV/AIDS	Agree with at least one of these	Believe a teacher with HIV should not teach	Would not buy food from a person with HIV/AIDS	Agree with at least one of these
Province						
Nairobi	49.5	35.1	56.5	62.5	40.6	66.3
Central	38.4	32.4	45.8	46.3	41.6	53.3
Coast	42.2	38.0	50.3	55.7	44.2	61.5
Eastern	35.2	29.7	41.8	44.8	37.8	52.2
Northeastern	28.3	22.7	32.5	58.2	56.7	63.3
Nyanza	37.2	38.5	48.6	50.2	45.4	60.7
Rift Valley	36.6	26.0	42.8	46.6	37.4	54.2
Western	37.9	32.4	47.2	54.8	46.3	63.2
Rural	35.7	30.9	43.9	46.1	39.8	54.4
Urban	49.0	36.7	55.9	65.1	46.3	69.7
Education						
None	26.9	24.3	33.7	43.1	35.8	48.6
Primary	36.3	29.9	44.7	44.3	36.0	52.7
Secondary+	52.7	42.5	59.9	64.2	51.9	70.2
Total	39.3	32.5	47.2	51.1	41.5	58.4

Source: Government of Kenya (2003); Government of Kenya/UNICEF (2003)

KIPPRA PUBLICATIONS

Conference Proceedings

Report of the proceedings of the AERC-KIPPRA World Trade Organization (WTO) Workshop, 2000

Report of the proceedings of the International Conference on Finance and Development: Evidence and Policy Issues, 2001

Discussion Papers

Njuguna S. Ndung'u (2000). *The exchange rate and the interest rate differential in Kenya: a monetary and fiscal policy dilemma*. KIPPRA DP No. 1

Karingi, S. N. and Njuguna S. Ndung'u (2000). *Macro models of the Kenyan economy: a review*. KIPPRA DP No. 2

Ronge, E. E. and H.O. Nyangito (2000). *A review of Kenya's current industrialization policy*. KIPPRA DP No. 3

Nyangito, H.O. (2001). *Delivery of services to smallholder coffee farmers and impacts on production under liberalization in Kenya*. KIPPRA DP No. 4

Njuguna S. Ndungu and R. W. Ngugi (2000). *Banking sector interest rate spread in Kenya*. KIPPRA DP No. 5

Karingi, S.N., M.S. Kimenyi and Njuguna S. Ndung'u (2001). *Beer taxation in Kenya: an assessment*. KIPPRA DP No. 6

Ikiara, M.M. (2001). *Vision and long term development strategy for Kenya's tourism industry*. KIPPRA DP No. 7

Geda, A. and Njuguna S. Ndung'u (2001). *Specifying and estimating partial equilibrium models for use in macro models: a road map for the KIPPRA-Treasury Macro Model*. KIPPRA DP No. 8

Geda, A., Niek de Jong, G. Mwabu and M.S. Kimenyi (2001). *Determinants of poverty in Kenya: household-level analysis*. KIPPRA DP No. 9

Were, M., A. Geda, S.N. Karingi and Njuguna S. Ndungu (2001). *Kenya's exchange rate movement in a liberalized environment: an empirical analysis*. KIPPRA DP No. 10

Huizinga, F., A. Geda, Njuguna S. Ndung'u and S.N. Karingi (2001). *Theoretical base for the Kenya macro model: the KIPPRA-Treasury macro model*. KIPPRA DP No. 11

Mwabu, G., M. S. Kimenyi, P. Kimalu, N. Nafula and D. K. Manda (2002). *Predicting household poverty: a methodological note with a Kenyan example*. KIPPRA DP No. 12

Manda, D.K., G. Mwabu, M. S. Kimenyi (2002). *Human capital externalities and returns to education in Kenya*. KIPPRA DP No. 13

Bedi, A., P.K. Kimalu, D.K. Manda, N.N. Nafula (2002). *The decline in primary school enrolment in Kenya*. KIPPRA DP No. 14

-
- Odhiambo, W. and H. Nyangito (2002). *Land laws and land use in Kenya: implications for agricultural development*. DP No. 15
- Were, M. and S. Karingi (2002). *Better understanding of the Kenyan economy: simulations from the KIPPRA-Treasury Macro Model*. KIPPRA DP No. 16
- Nyangito, H., M. Ikiara and E. Ronge (2002). *Performance of Kenya's wheat industry and prospects for regional trade in wheat products*. DP No. 17
- Nyangito, H. and L. Ndirangu (2002). *Impact of institutional and regulatory framework on the food crops subsector in Kenya: 1990-1999*. KIPPRA DP No. 18
- Ikiara, M. (2002). *Impact of tourism on environment in Kenya: status and policy*. KIPPRA DP No. 19
- Ronge, E., L. Ndirangu and H. Nyangito (2002). *Review of government policies for the promotion of micro and smallscale enterprises in Kenya*. KIPPRA DP. No. 20
- Kiringai, J., Njuguna S. Ndung'u, and S.N. Karingi (2002). *Tobacco excise tax in Kenya: an appraisal*. KIPPRA DP No. 21
- Were, M., Njuguna S. Ndung'u, A. Geda and S.N. Karingi (2002). *Analysis of Kenya's export performance: an empirical evaluation*. KIPPRA DP No. 22
- Mwangi S. Kimenyi (2002). *Ethnicity, institutions og governance and conflict avoidance*. KIPPRA DP No. 23
- Ikiara, M.M., L. Ndirangu (2003). *Prospects of Kenya's clothing exports under AGOA after 2004*. KIPPRA DP No. 24
- Nyangito, H. (2003). *Agricultural trade reforms in Kenya under the WTO framework*. KIPPRA DP No. 25
- Odhiambo, W. and H. Nyangito (2003). *Measuring agricultural productivity in Kenya: a review of approaches*. KIPPRA DP No. 26
- Ngugi, R.W. (2003). *Development of the Nairobi Stock Exchange: a historical perspective*. KIPPRA DP No. 27
- Njuguna, A. E., S.N. Karingi and M.S. Kimenyi (2003). *Alternative methodologies for measuring Kenya's potential output and output gap*. KIPPRA DP No. 28
- Ngugi, R. W. (2003). *What defines liquidity of the stock market? The case of the Nairobi Stock Exchange*. KIPPRA DP. No. 29
- Nafula, N.N. (2003). *Bank portfolios and bank earnings in Kenya: an econometric analysis*. KIPPRA DP No. 30.
- Manda, D.K. (2004). *Globalisation and the labour market in Kenya*. KIPPRA DP. No. 31.
- Bedi, A., P. Kimalu, M.S. Kimenyi, D.K. Manda, G. Mwabu and N. Nafula (2004). *User charges and utilisation of health services in Kenya*. KIPPRA DP. No. 32.

- Oiro, M. W., G. Mwabu and D.K. Manda (2004). *Poverty and employment in Kenya*. KIPPRA DP No. 33
- Odhiambo, W., H. O. Nyangito and J. Nzuma (2004). *Sources and determinants of agricultural productivity in Kenya*. KIPPRA DP No. 34
- Muthaka, David I, Diana N. Kimani, Stephen Mwaura, Damiano K. Manda (2004). *A review of the regulatory framework for private healthcare services in Kenya*. KIPPRA DP No. 35
- Kamau, A., S. Karingi, Njuguna S. Ndung'u, S. Mwaura. *Capital requirements and bank behaviour in Kenya: Empirical evidence*. KIPPRA DP No. 36
- Nafula, N. N., P. K. Kimalu, J. Kiringai, R. Owino, D. K. Manda, S. Karingi. *Budget mechanisms and public expenditure tracking in Kenya*. KIPPRA DP No. 37.

Occasional Papers

- Gitu, K. W. (2001). *Strengthening the link between policy research and implementation*. KIPPRA OP No. 1
- Kimenyi, M.S. (2001). *Effective private sector representation in policy formulation and implementation*. KIPPRA OP No. 2
- Kimenyi, M.S. (2002). *Agriculture, economic growth and poverty reduction*. KIPPRA OP No. 3
- Nyangito, H. (2002). *Post-Doha African challenges in the sanitary and phytosanitary and trade related intellectual property rights agreement*. KIPPRA OP No. 4
- Mwabu, G. (2004). *Principles of research*. KIPPRA OP No. 5

Policy Papers

- Nyangito, H.O. (2001). *Policy and legal framework for the tea subsector and the impact of liberalization in Kenya*. KIPPRA PP No. 1
- Nyangito, H.O. (2001). *Policy and legal framework for the coffee subsector and the impact of liberalization in Kenya*. KIPPRA PP No. 2
- Ikiara, M.M. and H. Nyangito (2001). *Effects of visa waiver and increase in airport tax on Kenya's tourism industry*. KIPPRA PP No. 3

Special Reports

- Legal and other constraints on access to financial services in Kenya: survey results*. KIPPRA Private Sector Development Division. SR No. 1, 2001
- Thinking about regulating? The better regulation guide*. KIPPRA Private Sector Development Division. SR No. 2, 2002
- Policy timeline and time series data for Kenya: an analytical data compendium*. KIPPRA Macroeconomics Division, SR No. 3, 2002

Tax analysis and revenue forecasting in Kenya. KIPPRA Macroeconomics Division, SR No. 4, 2003

Data compendium for Kenya's agricultural sector. KIPPRA Productive Sector Division, SR No. 5, 2003

Working Papers

Wasike, W.S.K. (2001). *Road infrastructure policies in Kenya: historical trends and current challenges.* KIPPRA WP No. 1

Ikiara, M.M. (2001). *Policy framework of Kenya's tourism sector since independence and emerging policy concerns.* KIPPRA WP No. 2

Manda, D.K., M.S. Kimenyi and G. Mwabu. *A review of poverty and antipoverty initiatives in Kenya.* KIPPRA WP No. 3

Kimalu, P.K., N. Nafula, D.K. Manda, G. Mwabu and M.S. Kimenyi (2001). *Education indicators in Kenya.* KIPPRA WP No. 4

Geda, A., S.N. Karingi, Njuguna S. Ndung'u, M. van Schaaijk, M. Were, W. Wassala and J. Obere (2001). *Estimation procedure and estimated results of the KIPPRA-Treasury macro model.* KIPPRA WP No. 5

Kimalu, P., N. Nafula, D.K. Manda, G. Mwabu and M.S. Kimenyi (2002). *A situational analysis of poverty in Kenya.* KIPPRA WP No. 6

Kiringai, J. and G. West (2002). *Budget reforms and the Medium-Term Expenditure Framework in Kenya.* KIPPRA WP No. 7

Ikiara, M. and L. Ndirangu (2003). *Developing a revival strategy for Kenya's cotton-textile industry: a value chain approach.* KIPPRA WP No. 8

Ng'eno, N.K., H.O. Nyangito, M.M. Ikiara, E.E. Ronge, J. Nyamunga (2003). *Regional integration study of East Africa: the case of Kenya.* KIPPRA WP No. 9

Manda, D. K., P.K. Kimalu, N. Nafula, Diana K. Kimani, R. K. Nyaga, J.M. Mutua, G. Mwabu, M.S. Kimenyi (2003). *Cost and benefits of eliminating child labour in Kenya.* KIPPRA Working Paper No. 10

Kimalu, P.K., N.N. Nafula, D.K. Manda, A. Bedi, G. Mwabu, M.S. Kimenyi (2004). *A review of the health sector in Kenya.* KIPPRA Working Paper No. 11

