

IBRAHIMA COULIBALY

The impact of HIV/AIDS on the labour force in Sub-Saharan Africa: a preliminary assessment



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on the labour force in Sub-Saharan Africa:
a preliminary assessment**

Ibrahima Coulibaly

ILO Programme on HIV/AIDS and the world of work, Geneva, October 2005

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EXECUTIVE SUMMARY

HIV/AIDS is not simply a health issue but a substantial threat to socio-economic development, imposing a heavy burden on families, communities and economies. The pandemic has affected most countries in the world: UNAIDS estimated that 38 million persons were HIV-positive worldwide in 2003. Almost 26 million were workers between the ages of 15 and 49—the most productive age group. This has implications for families and economies in terms of employment and labour market changes.

It is becoming clear that interventions designed to support employment, or economic policy, or a national HIV/AIDS strategy cannot be implemented without considering the particular impact HIV and AIDS are having on the economically active population. As little is known about the impact of HIV/AIDS on the labour force structure, this macro-quantitative study seeks to fill some of the gaps in this knowledge. The study's aim is to construct a database of statistics on HIV/AIDS and the labour force, and to analyse the probable effects of HIV/AIDS on labour force characteristics considered to be indicators of its impact.

Despite data limitations, the research allows a number of conclusions. HIV/AIDS has changed some of the main labour force characteristics of those countries most affected by the disease since the pandemic began, although the size of the labour force itself has not declined. HIV/AIDS was found to have:

- 1. reduced the rate of growth of the labour force**, although the effect on overall size is not yet quantifiable in absolute values, i.e. the economically active population is still growing but at a decreasing rate in hardest-hit countries;
- 2. modified the sex distribution of labour force participation rates** in countries severely affected by HIV/AIDS - in these countries, the study shows a decline in the male participation rates and a slight increase in female participation (suggesting the entry of widows into the labour market);
- 3. altered the age distribution of labour force participation:** the 15-24 age group records the highest increase in labour force participation in countries with high HIV prevalence rates, indicating that many young people have joined the labour force to replace workers who leave as a result of illness or death;
- 4. reduced average school enrolment** for countries deeply affected by HIV/AIDS - for example, the number of children enrolled in primary school in Zambia, Zimbabwe and Namibia decreased by 42.5 per cent, 17.9 per cent and 13.2 per cent respectively between 1986 and 2003;
- 5. reduced the rate of growth of the agricultural labour force:** although there was no decline in the absolute number of workers in agriculture, the rate of growth declined, particularly in countries most seriously affected by HIV/AIDS; and
- 6. reduced the average age of the labour force** and thereby the average years of experience. The average in the group of countries most heavily affected by HIV/AIDS fell from 34.1 to 32.8 years.

1. Introduction

HIV/AIDS has become one of the most complex development challenges the world has faced. Current statistics starkly demonstrate the severity of the pandemic¹:

- by the end of 2003 an estimated 38 million adults and children were living with HIV
- Sub-Saharan Africa is the region most affected with 25 million persons living with HIV (two-thirds of the global estimate)
- by the end of 2003, the total number of deaths attributed to AIDS since the first cases were identified was about 20 million, with 3 million estimated deaths in Sub-Saharan Africa for 2003 alone
- over 13,800 people become infected worldwide each day, and 8,000 of them live in Sub-Saharan Africa
- at the end of 2003, 15 million children were estimated to have been orphaned as a result of HIV/AIDS, and 80 per cent of them (12.1 million) live in Sub-Saharan Africa.
- 57 per cent of adults living with HIV in Sub-Saharan Africa are women.

Although many actions have been undertaken to halt the progression of the pandemic, it is still expanding, in terms of deepening impact as well as new infections. To better address the epidemic and implement targeted programmes and strategies, it is crucial that policy-makers understand the severity of the national situation. HIV/AIDS impact assessments can be important analytical tools for advocacy and planning for both prevention and impact mitigation.

The majority of studies on HIV/AIDS state that the size of the labour force has not been reduced and it will continue growing, albeit at a slower rate than it would have done without HIV/AIDS. Additionally, pilot studies show that the structure and characteristics of the labour force have changed in countries with high prevalence rates. The objective of this study is to further examine the impact of HIV/AIDS on changes in the structure and composition of the labour force, by correlating changes in HIV prevalence with changes in indicators viewed as susceptible to the impact of HIV and AIDS, and drawing conclusions based on that analysis.

This study was one of the background papers for the 2004 report, *HIV/AIDS and work: global estimates, impact and response*. The reader is referred to the ILO report for elaboration on the impact of the epidemic and its country-specific effects (see ILO, 2004).

¹ The Joint United Nations Programme on HIV/AIDS (UNAIDS), 2002 and 2004.

2. Methodology

Many studies have attempted to measure the impact of HIV/AIDS (see for example Over, 1992; ILO, 2000; Ruhl et al., 2002; United Nations, 2003 and Vass, 2003). Most have focused on the probable impact of the pandemic on different demographic and macro-economic indicators in the long term—generally from 10 to 30 years. Given the lack of time series data and accurate trends, impact assessments have generally been based on hypothetical estimates and projection models under scenarios of ‘no AIDS’ and ‘AIDS’ rather than investigation of past and actual conditions.

This study relates changes in HIV prevalence to changes in the relevant variables of the structure and composition of the labour force between 1986 and 2003. One of its challenges is to isolate the effects of AIDS on the structure of the labour from other influences. For example, the age structure of the workforce is a consequence of population ageing but it is also influenced by conflicts, war casualties, and population movements (particularly in some African countries). In certain cases, also, HIV/AIDS may simply be an acceleration factor rather than a direct cause of a given socio-economic change. Conducting full econometric analysis would be very demanding in data requirements.

This study aimed therefore to analyse changes in the composition and characteristics of the labour force of countries deeply affected by HIV/AIDS, and compare them with those that are less affected, in order to arrive at conclusions concerning the impact of HIV/AIDS on the labour force.

This was done by dividing the countries into three groups according to the change in estimated national HIV prevalence between 1986 and 2003:

Group 1: countries with a change in the HIV prevalence rate of more than 11 per cent

Group 2: countries with a change in HIV prevalence of 2 to 7 per cent

Group 3: countries with a change in HIV prevalence of less than 2 per cent.

Countries in Group 3 were used as the ‘control group’ to assess the likely HIV/AIDS impact on Group 1, whereas countries in Group 2 helped to confirm this effect. Additionally, scatter plots on the groups of countries and a ‘line of best fit’ estimation were designed to see if a systematic pattern of association exists between change in HIV prevalence and change in labour force indicators over time. It should be noted that countries covered by the study included those for which recent data was available. Thus, the study includes 31 of 53 countries for which the demographic impact of HIV/AIDS is explicitly incorporated in the 2002 United Nations revision of world population estimates and projections (UN, 2003a).

3. Data collection

The most common indicator used to measure the effect of the HIV/AIDS epidemic is the prevalence of HIV infections in the adult population, i.e. the 15-49 age group. HIV prevalence data at national level are virtually non-existent for the early stages of the epidemic (end 1970s – beginning 1980s). The first step was to collect HIV prevalence data from the earliest year available to the latest year. The second step was to conduct a thorough search of labour force information corresponding in time as closely as possible to HIV data collected previously (in order to compare changes between the two types of variables). As data on both HIV and labour force have not often been compiled or updated at international level, much data was obtained through national surveys and reports.

4. Sources of data

The study used a variety of sources to collect and analyse data on HIV/AIDS and labour force characteristics. The Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) database provided information on HIV prevalence rates for recent years (1997 to 2003). UNAIDS and WHO estimates used in this study are from sequential reports on the epidemic and the *HIV/AIDS Epidemiological Surveillance Update* of the WHO African Region. These reports give descriptions of recent data on the epidemic and present the current global HIV/AIDS state and trends. The HIV/AIDS Surveillance Database developed by the US Bureau of Census and other data sources such as the MEASURE DHS+, Demographic and Health Surveys, country HIV/AIDS/STI surveillance reports, and HIV Surveillance Reports from the Centers for Disease Control and Prevention (CDC) provided useful HIV estimates for the earliest years. The recently updated HIV/AIDS database produced by the US Bureau of the Census compiles all HIV survey data for every country in the world since the mid-1980s. These data were supplemented where and when necessary with national HIV/AIDS survey information.

Different sources were used to assemble data on labour force characteristics. The ILO labour force statistics database (LABORSTA) and the ILO's *Key Indicators of the Labour Market* database (KILM) were used to provide information on labour force statistics. In addition, national surveys, including the *Core Welfare Indicators Questionnaire* (CWI) and the *Household and Income Survey* (IES), were used to compile and complete labour force data. LABORSTA and KILM compile data from censuses and labour force surveys as well from international organizations, and attempt to make them comparable over time and across countries.

The exact period covered in each analysis depends on data availability in the countries studied for the years between 1985 and 2003, which corresponds to the earliest and the latest data available on HIV-prevalence.

As data were collected from diverse sources and different methodologies were used to compile them, there are recognized limitations to the strict comparability of observations, estimations and data over time and across countries. The study has nevertheless succeeded in demonstrating the salient features of the impact of HIV/AIDS on the labour forces of certain economies.

5. Indicators of the impact of HIV/AIDS on the labour force

Several quantitative and qualitative indicators were used to assess the impact of HIV/AIDS on the structure and composition of the labour force. These indicators can be affected by the epidemic either directly (i.e. the size of the labour force) or indirectly (i.e. unemployment rate). It should be noted that in either case the indicators utilized here are in no sense exhaustive.

The hypotheses regarding the sensitivity of indicators to the HIV/AIDS impact on the labour force are:

The size of the labour force

Unless specified otherwise, the term "labour force" refers in this paper to all persons of working-age (i.e. 15-64 years) who are in paid employment, gainful self-employment, or unemployed, but available for and seeking work.

The effect of HIV/AIDS on the size of the labour would be through a withdrawal of workers or unemployed persons from the labour market. This effect is not yet visible in terms of absolute values. However the labour force is anticipated to continue growing at a slower rate than it would without AIDS.

The average age of the labour force

HIV/AIDS would cause the early entry of orphans and the retention of older workers in the labour force, as well as the early retirement of workers living with HIV/AIDS. As a consequence, the average and the median labour force age may change, depending on the level of labour turnover over a given period of time (the number of persons entering and leaving the labour market).

The average years of experience of the labour force

The average experience level of the labour force is the difference between the average age of workers and the average age at entrance into the labour force. As the average age of workers both inside the labour force and entering it may change due to HIV/AIDS, the average years of experience of the labour force may also be altered.

The labour force participation rate

A change in the labour force participation rate would be expected to result from a change in the size of both the working age population and the labour force. Also the entry of women into the labour force due to the number of widows seeking work would change the gender distribution of labour force participation.

The age-specific distribution of the labour force

The combination of new entries of children and older workers into the labour market as well as loss of workers ill or dying from HIV/AIDS would modify the structure of the labour force and change the age-specific labour force participation rates, e.g. the labour force participation rate of the 15-24 year age group may increase.

Unemployment rate

Initially the labour force supply would be reduced due to the withdrawal of workers with AIDS. Although previously inactive persons would start to replace those leaving the labour market, the skills, qualifications and/or experience required would not always match the new labour supply available. In the case that key workers or essential management cannot be replaced, additional job losses would result from lay-offs due to enterprise failure. Thus, the unemployment rate may rise.

Labour productivity

A large proportion of HIV-positive workers, both skilled and unskilled, die in their most productive years. As younger and less experienced people replace them, productivity decreases. Also, the morale of healthy workers may be affected due to problems associated with family members or co-workers who are HIV-positive. Another factor that affects productivity is the withdrawal of or decline in investment in technology due to rising costs and falling profits.

Working hours

Increased absenteeism due to illness and attendance at funerals is the major factor that would reduce actual working hours. But early retirement of workers living with HIV/AIDS would also decrease the total working hours due to turnover time losses associated with their replacement.

Human capital / quality of the labour force

HIV/AIDS destroys the human capital that represents the accumulation of life experiences, and of human and job skills and knowledge, that are built up over years through schooling, formal education, learning on the job and training. The loss of qualified workers due to HIV/AIDS would lead to a lowered level of skills and experience of the labour force. Moreover, the loss of adult workers would interrupt the informal transfer of skills and knowledge to younger generations, thereby diminishing the quality of the labour force. Additionally, de-schooling of orphans and other children as well as premature or late entry of unqualified workers into the labour force results in a reduction of the quality of human capital supply in the longer term.

Level of education of the labour force

The level of education is affected by lowered enrolment rates due to increased drop-out of pupils and students as a result of the disease or economic needs (e.g. entering the labour force to support relatives living with AIDS). Additionally, fewer students in tertiary education, fewer children able to complete school and a decline in the number of teachers can adversely impact the educational level of the labour force.

Labour costs

Labour costs are affected by AIDS-related illnesses and deaths: health care, insurance costs, shortage of labour and working hours, wages for substitute workers, costs of recruitment of replacement employees, additional training costs, etc. This would lead to a rise in labour costs.

Employment to population ratio

The decreasing numbers both of the working-age population and of employed persons as a result of HIV/AIDS would change the employment to population ratio.

Full-time/part-time employment

Healthy workers may switch from full-time to part-time employment in order to care for relatives living with AIDS. This would have an impact on the distribution of full/part time employment and the number of hours worked. Similarly, workers living with HIV/AIDS may switch to part-time employment for a period before fully leaving employment.

Type of contract or employment

Employment can be on a permanent, short-term or seasonal basis. Where seasonal workers record higher incidence or prevalence rates because of exposure to HIV related to their mobility, the loss of their labour will adversely affect sectors relying on it.

Sector-specific impact

The impact of HIV/AIDS varies across sectors and can be very severe in its nature and intensity in particular sectors of an economy. Agriculture, transport, construction and tourism have been found to be especially affected when taking into account the higher risks of HIV transmission associated with the mobility of seasonal and short-term workers. Agriculture is the largest sector in most African economies, and the loss of agricultural labour is crucial in countries with high prevalence rates. Mining and other industries such as manufacturing that are dependent on migrant and contract labour are also particularly affected by HIV/AIDS. In the health sector, there is increased demand for health care at the same time as HIV prevalence among health workers is rising, as in the general population.

On the demand side, there is lowered availability of hospital beds as numbers of persons living with HIV/AIDS rise, an increased workload for health workers, a reduction in the overall quality of health services and care, as well as rising medical costs. On the supply side, the health sector in Africa in particular is losing valuable human resources due to HIV/AIDS morbidity and mortality which includes health planners, managers, nurses and physicians. In the education sector, also, both demand and supply are affected. The impact of the epidemic on the education sector is seen in the loss of teachers, principals and educational planners and policymakers, with accompanying sharp increases in pupil-teacher ratios and, paradoxically, in declines in school enrolment and increased drop-out rates where children must enter the labour force urgently or provide care and services in the home.

Skills profile

Low income and unskilled employees would have a higher risk of exposure to HIV transmission than high income and skilled employees for socio-economic reasons, because of their lower level of education, and their generally greater mobility for work (e.g. seasonal workers).

Child labour

Children whose parents are living with HIV/AIDS or have died would enter the labour force early to support their parents or relatives, or themselves, increasing child labour in some countries.

6. Evidence of HIV prevalence in Sub-Saharan Africa

HIV transmission is recognized to have first occurred in the late 1970s and the early 1980s. Since then, HIV prevalence has intensified in many countries, mainly in Sub-Saharan Africa. Despite apparent declines in very recent years, the most recent estimates of HIV prevalence in parts of this region remain extraordinarily high. Table 1 presents estimates of adult HIV-prevalence rates for 31 countries, classified according to overall changes in prevalence rates between 1986 and 2003.

Although in most cases the data in Table 1 suggest a uniform rise in prevalence to an apparent peak year (number in grey) followed by a subsequent decline, these changes do not yet allow the conclusion that the epidemic is receding in the African region. Over the period covered, methodology of measurement of HIV prevalence has improved, and estimates for 2003 and 2001 were recently revised downward by UNAIDS and WHO (UNAIDS and WHO, 2003; UNAIDS, 2004). There is no indication for Sub-Saharan Africa as yet, therefore, that the proportion of persons becoming HIV-positive is truly

declining, nor that the numbers of persons living with HIV/AIDS is lower than at any time in the past, with the exception of Uganda that has been well documented (see below).

Consequently, although the changes in prevalence are more detailed in Table 1, the analysis carried out is based on the simple assumption that true change in HIV prevalence between 1986 and 2003 is better reflected by the overall increase between the earliest and latest HIV prevalence estimates. This assumption overcomes the possibility that the apparent peak merely reflects overestimation in the earlier years of HIV prevalence methodology.

The data in the table confirm that southern and eastern African countries consistently remain the worst affected. In these countries, the epidemic expanded rapidly, and the overall change in the prevalence rate was an increase of over 18 per cent on average (Group 1); by 2003, on average over 19 per cent of persons in the productive age group (15-49) were living with HIV in this group of countries. At the other end, the average prevalence level in countries with an average overall increase of 0.5 per cent (Group 3) has remained relatively low (the average prevalence was 4 per cent in 2003). Whereas estimates of HIV prevalence were roughly the same in 1986 for the three groups of countries, the average prevalence for countries in Group 1 had grown to be nearly five times greater than in Group 3 by the end of 2003 (i.e. 19.2 and 4 per cent respectively, see Figure 1).

Country-specific analysis confirms the record of growth in HIV prevalence rates for all countries, despite wide differences in prevalence across countries. The proportion of adults who are HIV-positive has increased far more in some countries while remaining relatively stable or suggesting decline in others.

Table 1: Trend in HIV prevalence rates in adults, selected countries

Year	1986 ^a	1995	1997	1999	2001	2003	Change ^b			
Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)							Prior to apparent peak	After apparent peak	Overall change 1986-2003	Average annual growth rate ^c
<i>Group 1: Countries with overall change of more than 11 per cent</i>										
Botswana	0.2	18.0	25.1	35.8	38.0	37.3	37.8	-0.7	37.1	12.2
Swaziland	2.6	na	18.5	25.3	38.2	38.8	na	na	36.2	12.0
Lesotho	0.0	4.4	8.3	23.6	29.6	28.9	29.6	-0.7	28.9	28.0
South Africa	0.0	10.5	12.9	19.9	20.9	21.5	na	na	21.5	20.8
Zimbabwe	3.2	17.1	25.8	25.1	24.9	24.6	22.6	-1.2	21.4	5.5
Namibia	0.0	na	19.9	19.5	21.3	21.3	na	na	21.3	19.8
Zambia	3.9	na	19.1	20.0	16.7	16.5	16.1	-3.5	12.6	1.9
Malawi	1.7	13.6	14.9	16.0	14.3	14.2	14.3	-1.8	12.5	4.1
Mozambique	0.4	na	14.2	13.2	12.1	12.2	13.8	-2.0	11.8	6.6
Central African Rep.	2.0	6.9	10.8	13.8	13.5	13.5	11.8	-0.3	11.5	6.5
Weighted average	1.0	11.9	15.7	19.2	19.1	19.2	18.2	0.0	18.2	7.8
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>										
Cameroon	0.4	4.8	4.9	7.7	7.0	6.9	7.3	-0.8	6.5	6.9
Nigeria	0.3	2.2	4.1	5.1	5.5	5.4	5.2	-0.1	5.1	9.6
Ethiopia	0.1	8.7	9.3	10.6	4.1	4.4	10.5	-6.2	4.3	1.0
Côte d'Ivoire	2.8	7.7	10.1	10.8	6.7	7.0	8.0	-3.8	4.2	0.9
Angola	0.5	na	2.1	2.8	3.7	3.9	na	na	3.4	8.1
United Rep. of Tanzania	5.5	6.4	9.4	8.1	9.0	8.8	3.9	-0.6	3.3	2.5
Rep. of Congo	2.3	7.2	7.8	6.4	5.3	4.9	5.5	-2.9	2.6	-0.5
Burkina Faso	2.0	6.7	7.2	6.4	4.2	4.2	5.2	-3.0	2.2	-1.1
Rwanda	3.0	na	12.7	11.2	5.1	5.1	9.7	-7.6	2.1	-5.9
Burundi	3.9	7.6	8.3	11.3	6.2	6.0	7.4	-5.3	2.1	-1.0
Sudan	0.3	na	1.0	1.0	1.9	2.3	na	na	2.0	9.2
Weighted average	1.2	4.4	6.1	6.8	5.3	5.3	5.6	-1.5	4.1	3.6
<i>Group 3: Countries with overall change of less than 2 per cent</i>										
Kenya	4.8	11.6	11.6	14.0	8.0	6.7	9.2	-7.3	1.9	-1.4
Sierra Leone	1.1	na	3.2	3.0	na	na	2.1	-0.2	1.9	na
Ghana	1.7	na	2.4	3.6	3.1	3.1	1.9	-0.5	1.4	2.6
Mali	0.7	na	1.7	2.0	1.9	1.9	1.3	-0.1	1.2	2.7
Benin	0.8	2.0	2.1	2.5	1.9	1.9	1.7	-0.6	1.1	2.4
Somalia	0.0	na	0.2	na	na	na	na	na	1.0	na
Senegal	0.1	na	1.8	1.8	0.8	0.8	1.7	-1.0	0.7	-2.5
Congo, Dem. Rep.	3.7	3.7	4.4	5.1	4.2	4.2	1.4	-0.9	0.5	0.8
Equatorial Guinea	0.3	0.9	1.2	0.5	na	na	0.9	-0.7	0.2	na
Uganda	9.0	10.4	9.5	8.3	5.1	4.1	1.4	-6.3	-4.9	-6.1
Weighted average	3.5	4.8	5.6	6.5	4.5	4.0	3.0	-2.5	0.5	-0.8

na: not applicable

0.0: apparent peak

^a Data are for 1985 in the case of Botswana, Lesotho, South Africa, Central African Republic, Ethiopia, Rwanda, Burundi, Somalia, and Democratic Republic of Congo; for 1988 in the case of Mozambique; and 1990 in the case of Swaziland, United Republic of Tanzania, Kenya, Sierra Leone and Benin

^b Change is the difference between earliest prevalence estimate and apparent peak; apparent peak and most recent prevalence estimate. Overall change is the difference between earliest and most recent prevalence estimate

^c The average growth rate is derived as the geometric mean using the following formula:

Average growth rate =

$$\left(\left(\prod_{i=1}^n (Growth\ rate_i + 100) \right)^{\left(\frac{1}{n} \right)} \right) - 100$$

where n is the number of years

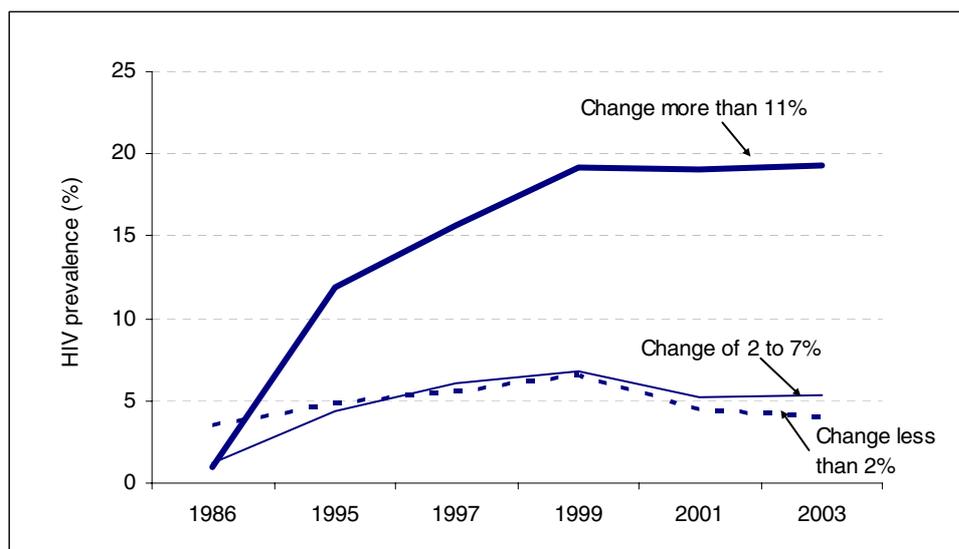
Sources:

CDC, various years; Demographic and Health Surveys, various years; MEASURE DHS+, various years; National survey reports, various years; UNAIDS & WHO, 1998; idem 2000; idem 2004; U.S. Census Bureau, 2003

Uganda is often cited because of its successful efforts to reduce HIV prevalence levels². Early in the epidemic, in 1986-87, the prevalence rate was among the highest in the world at the time (9 per cent) and was increasing. The declining trend began in 1993 after a peak in 1992³. The rate fell from 14.4 per cent in 1994 to 4.1 per cent in 2003, which represents an average decline in prevalence rate of about 1 percent per year over the period. Other countries - Burkina Faso, Burundi, Kenya, Republic of Congo, Rwanda and Senegal - also show apparent decreases in the prevalence of HIV between 1997 and 2003, but the scope and certainty of these declines need confirmation.

The level of HIV prevalence rate has stagnated in some countries at a high or low level since 1997. In Group 1, for example, the rate of adults living with HIV in Zimbabwe has remained around 25 per cent whereas in Group 3, prevalence in Mali has remained at a constant 2 percent. In Group 2, the HIV prevalence rate in the United Republic of Tanzania has been estimated to be steady at around 9 per cent.

Figure 1: Average estimated HIV prevalence rate for 3 groups of countries, 1986-2003 (weighted by population)



² See UNAIDS Best Practice Collection: *A measure of success in Uganda*. Thailand, Senegal and the United States of America have also been quoted as successful in their national programme in response to the HIV/AIDS epidemic (Kamenga,(2001)).

³ Uganda AIDS Commission Secretariat, 2002.

However, these differences should not be allowed to hide the serious progression of the epidemic in Sub-Saharan Africa. As has been mentioned, southern Africa bears the heaviest burden of the epidemic. In Botswana and Swaziland, well over a third of the adult population – virtually 4 of every 10 adults - lives with HIV, and in Lesotho nearly a third of adults are HIV-positive. Over the period 1985 to 2003, the estimated proportion of people living with AIDS in Botswana and Lesotho increased sharply, from virtually nothing to 37.3 and 29 per cent respectively.

South Africa has also experienced a very rapid increase in the transmission of HIV in the last decade. In 1985, there was no record of persons infected by HIV. The prevalence rate was below 1 per cent (0.7 percent) in 1990. By 2003, the HIV prevalence rate among adults was over 20 per cent. As a result, and because of its size, South Africa now has more people living with HIV than any other country in the world (5.3 million persons at the end of 2003) (UNAIDS, 2004).

7. The impact of HIV/AIDS on labour force characteristics

This section compares changes in HIV prevalence with changes in labour force indicators by country groupings (Groups 1 to 3) to see if there is a pattern of relationship between level of HIV prevalence rates and changes in labour force indicators. As mentioned previously, the groupings are based on the country's overall per cent change in HIV prevalence rate.

It is well to bear in mind that analysis of the HIV/AIDS impact should take into account various factors contributing to change in labour force characteristics other than HIV/AIDS.

7.1 The size of the total labour force

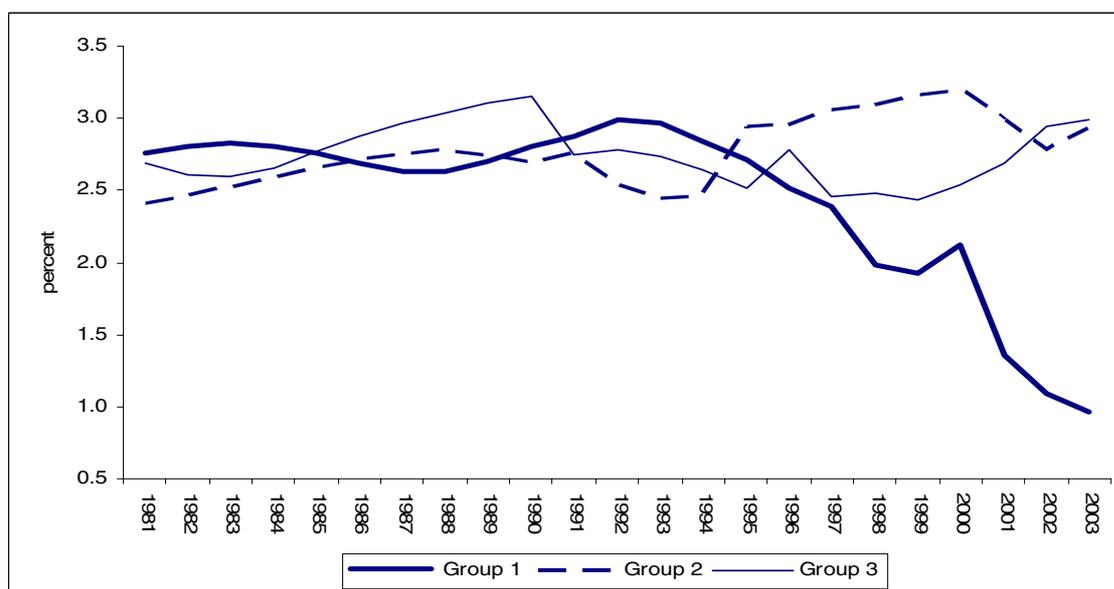
Changes in labour force characteristics are summarized in Table A1 in Annex 1. Over the period, the size of the total labour force increased in all countries, regardless of the level of change in HIV prevalence. The average number of people in the workforce grew by almost 70 per cent or more in all groups of countries. The exception was Sierra Leone where the economically active population declined by 3.7 percent between 1990 and 2003, most probably because of the conflict that began in 1991.

Consequently the effect of HIV/AIDS on the labour force size was not quantifiable over the period in absolute values. It is expected that the size of the economically active population will continue growing, but at a slower rate than it would have in the absence of HIV/AIDS. For the time being, demographic factors still have greater effects on the growth of the labour force than either HIV/AIDS or changes in participation rates, even in the hardest-hit countries. Figure 2 illustrates the trend in labour force annual growth rate in the three groups of countries.

The effect of HIV/AIDS on labour force growth is not observable from the beginning of the epidemic until the early 1990s in all groups of countries (see Figure 2). Growth rates then ranged between 2.5 and 3.0 per cent thereafter. The effect of the disease on the most productive labour force participants (15-49 age group) became apparent in the mid-1990s as a larger proportion of workers were affected by the epidemic. Whereas the rate of growth of countries less affected by the epidemic (Group 3) continued to fluctuate in the

same range (2.5 to 3.0 percent), the rate of growth in highly affected countries (Group 1) decreased sharply after 1993. Indeed, the rate of growth of the labour force for the overall group of countries fell from about 3.0 to about 1.0 per cent by 2003, which is a 2.0 per cent loss in growth by the end of the period.

Figure 2: Annual growth rate of labour force aged 15 to 49 years for each group of countries, 1981-2003 (per cent)



7.2 Youth labour force

The youth labour force (age 15-24 years) has virtually doubled in the three groups of countries. Only Sierra Leone shows a sizeable reduction of its youth labour force. These observations underscore the large effect of demographic factors, notably earlier prevailing high fertility rates. A scatter plot of HIV prevalence and youth labour force size for the period (see chart 2 in Annex 2) shows a positive relationship supporting the assumption that more young people join the labour force to replace the older workers where they have been removed because of HIV/AIDS.

7.3 Average age of the labour force

HIV/AIDS affects the age distribution of the labour force as a result of three factors: (a) it stimulates greater entry of young people and children into the labour market; (b) it causes the withdrawal of older workers who are HIV-positive and become ill and (c) it causes more retention of older workers who are not ill, and may stimulate the entry of older workers who are newly having to support families. As AIDS affects the composition of each age group, the average age of the economically active population is changed, and the overall change will result from the different weights of the different age group effects.

The average age⁴ of the labour force has declined in most countries, regardless of prevalence (see table A1). The average age of the workforce of countries in Group 3 increased slightly, by 0.6 per cent (from 33.4 to 33.5 years), whereas countries in Group 1 declined by nearly 4 per cent (from 34.1 to 32.8 years) and the average age in Group 2 countries declined by nearly 6 per cent. The decrease in average age in all countries in Groups 1 and 2 is directly related to the increasing number of young people joining the labour force, and the overall decline in the supply of older workers. Table A1 also shows that countries with a larger increase in the youth labour force tend to show a larger decline in average age (in absolute values). The decline of the average age in hardest-hit countries would be even more marked if the analysis included children, but this issue is examined in another section (see section 7.13, on child labour).

7.4 Average years of experience of the labour force

The analysis of this indicator is analogous to the one in the previous section. The average number of years of experience is positively associated with the average age of the labour force. If the proportion of the young age group in the labour force increases, there is a decline in both average age and average years of experience in the total labour force. Changes may not occur on the same scale, however. As Table A1 shows, changes in years of experience were always greater than changes in age in terms of absolute values. This systematic difference implies that additional years of experience are lost to the labour force, hence reducing its quality, when older workers are replaced by younger workers because of urgency and necessity rather than on the basis of a strategy that provides opportunities for planning and training.

Countries in Group 1 show a 6.5 percent fall in average years of experience, and countries in Group 3 a small increase, whereas the countries of Group 2 show a loss on average of nearly 10 years of experience. These observations support the contention that in lowering the age of the labour force, HIV/AIDS reduces the average years of experience in countries significantly affected by the epidemic.

7.5 Labour force participation rates

One could assume that the labour force participation rate would remain unchanged as both the working-age population and the labour force are reduced in size. But it is not strictly the case when the population and the labour force do not decline (or increase) at the same rate. Also, workers leaving the labour force (or the labour market) as a result of HIV/AIDS die later, after a period of survival lasting from a few months to about 2 years even in the absence of treatment, and the losses to the population therefore lag behind the losses to the labour force. Table A2 shows decreases in participation rates for some countries regardless of the levels of infection. Comparing the average change between the three country groups it appears that participation rates increased slightly, however, for all three. The increase is higher overall in the intermediate countries of Group 2 (15.6 per cent) than in those more affected by HIV/AIDS (10.2 per cent), which is largely explained by the increased participation of the youngest workers in the intermediate countries (44.5 and 17 percent respectively). Changes in participation of young people in the labour force are the highest component of overall changes, which is a further indication that more

⁴ Estimate based on the mid-points of the age groups weighted by the number of workers in each age group.

young people have supplied the labour demand in affected economies, and remarkably so in some countries at all levels of HIV prevalence.

With respect to the sex distribution of participation in the labour force, although the gap between male and female participation has been narrowing in most economies since 1980, the downward trend is expected to become more marked in the countries most affected. Comparing the labour force participation rate of males and females in countries deeply affected (Group 1), it emerges that the male labour force was more affected by HIV/AIDS than the female labour force. This is because the employment rate of men in the formal economy is generally much higher than that of women in these countries. Moreover, female participation increased far more in Groups 1 and 2 than in Group 3, suggesting that it represents in some measure the replacement of lost male labour, and a household-level compensation, perhaps by widows, for the loss of income due to illness and death of the former breadwinner or head of household. All countries in Group 1 with a decrease in male participation show an offsetting rise in the female participation rate. A specific country analysis indicates that countries among the most seriously affected, such as Lesotho, South Africa and Zambia, have recorded a significant rise in their female participation rates. In Zambia, female participation has virtually doubled in 16 years (97.5 per cent). In Lesotho where male participation has fallen by nearly 6 per cent there is an increase in female participation of 17 per cent.

Scatter plots were generated to illustrate the likely trend in HIV prevalence and labour force participation rates (see Annex 2, charts 3 and 4). The regression line shows a general decrease in male participation rates along with HIV prevalence rate. However, there is a slightly positive trend for female participation supporting the fact that women increasingly joined the labour market in response to the epidemic, to replace those who have lost their jobs, who are too ill to provide an income, or who have died as a result of AIDS.

HIV/AIDS is assumed to affect the age distribution of the labour force participation rate through the ages at which people enter and leave the labour market. Table A2 shows that many young people joined the labour force despite a negative change in participation in some countries. Comparing participation rates for all ages in the three groups of countries, it emerges that the 15-24 age group showed the highest increase in labour force participation in Groups 1 and 2, the countries with high prevalence rates. The average increase in participation for the 15-64 age group was 10.2 and 15.6 per cent respectively whereas the increase for persons aged 25 to 34 years was 7.7 and 6.0 per cent. The oldest workers (those aged 55 to 64 years) significantly lowered their participation in the labour market over the period. Changes in participation by age did not show a detectable pattern in Group 3 countries, significantly less affected by HIV/AIDS. The overall results suggest that young people participate more in the labour force in countries with high HIV prevalence than those in countries not so affected, and this may reflect the effects of HIV/AIDS on the labour force as well as other factors such as national youth employment policy.

7.6 Unemployment

In theory, unemployment is indirectly linked to HIV/AIDS. Other factors such as the economic situation (economic growth/decline) are strongly correlated with rates of unemployment. Table A3 shows that the number of unemployed persons increased in most countries regardless of level of HIV prevalence. In South Africa, for example, the number of people seeking employment increased sharply, from 110,700 to 4.5 million, between 1990 and 2003. Uganda, which recorded a decrease in HIV-prevalence rate over the period 1986 to 2003 (the prevalence fell from 10.4 percent - apparent peak- to 4.1 percent), experienced an increase in the number of unemployed of more than 500 per cent. Over the same period, the trend was similar in Nigeria with intermediate HIV prevalence.

Although there is no apparent pattern across groups of countries in terms of unemployment, the average per cent change in numbers of unemployed is most intense in the high prevalence countries.

There are few data on youth unemployment, but scatter plot 6 suggests a positive relationship between HIV prevalence and the number of youth unemployed. It shows a slightly positive trend but this could not be directly attributed to HIV/AIDS; there is a possibility, however, that the effect of the epidemic may be to act as an acceleration factor in increasing the level of the unemployment rate.

7.7 Labour productivity

In general, labour productivity would be affected by HIV/AIDS because of the loss of skilled workers, an increase in absenteeism and the entry into the labour market of less experienced young people and older persons who have not worked before. Table A3 shows productivity changes for countries where data were available. Nevertheless, because of lack of data for the majority of countries, no consistent conclusion may be drawn from the data shown.

At micro level, the impact is more apparent as results are based on surveys of enterprises. In a study they conducted on Zambian businesses, Baggaley et al. (1994) found that HIV/AIDS may have reduced productivity in 48 per cent of companies surveyed between 1987 and 1992. Moreover, a study in Kenya examined the impact of HIV/AIDS on productivity of 54 tea-estate workers who died from of HIV/AIDS between 1997 and 2002 (Fox et al., 2003). The study showed that their productivity declined as AIDS progressed, especially in the last years before death. In their last two years of life, those who ultimately died of AIDS produced roughly one third less than the other workers. Additionally, the earnings of HIV-positive workers declined by more than 18 per cent during their last year of life. They also took significantly more leave in the three years preceding death.

7.8 Impact on education

AIDS affects the supply and demand sides of education. The supply of teachers is reduced by AIDS-related illness and death, and children may be kept out of school if they are needed at home to care for sick family members or may drop out of school for economic reasons. Thus, declines in the number of teachers and in school enrolment are the most visible effects of the epidemic on education. To estimate the impact of AIDS on education, the change in pupil-to-teacher ratio and primary, secondary and tertiary school enrolment were compared with the change in HIV prevalence rate. Again, HIV/AIDS might be only one among several reasons for changes in school attendance and teacher absenteeism, but significant shifts over a long period of time are likely to be attributable, at least in part, to conditions arising from the impact of HIV/AIDS.

The pupil-to-teacher ratio addresses both the supply and demand for education, corresponding to the average number of pupils per teacher. A positive change denotes either a decrease in the number of teachers or an increase in the number of pupils (all things being equal). See table A4 for the impact on education indicators.

In South Africa, the number of pupils per teacher rose from 27 in 1990 to 37 in 2002, an increase of 37 per cent, which, given the large size of its population, is consistent with the finding by UNICEF in 1999 that it was the country in Sub-Saharan Africa in which the largest number of children (100 000) had lost their teacher to AIDS (UNICEF, 2000). The rise was smaller in Zambia, where the pupil/teacher ratio rose by nearly 14 per cent between 1985 and 2002. The Zambian Ministry of Education reported that in 1996 alone

680 teachers (2.2 per cent) died from AIDS. This number is expected to rise to approximately 2000 a year by the year 2005—equivalent to the death of 5-6 teachers every day (Kelly, 1998). In Zimbabwe, where the ratio rose by over 6 per cent, a recent study found that 19 per cent of male teachers and nearly 29 per cent of female teachers were HIV-positive (UNAIDS, 2002). Consequently, high morbidity and mortality, especially among experienced and well-qualified teachers, poses a major organizational challenge, calling for appropriate measures.

Paradoxically, the data in Table A4 suggest that the average pupil-to-teacher ratio shows a more marked decrease in Group 3 countries than in Group 1 countries, which does not support the information on the impact of teacher loss. On the other hand, this counterintuitive observation may in fact be due to the greater adverse impact HIV/AIDS has on pupil enrolment than on the attrition of teachers.

HIV/AIDS can affect school attendance at different levels of education at all levels of prevalence, but it appears to have the greatest impact on primary school enrolment in the higher-prevalence countries. Table A4 reveals that more than half of the most intensely affected countries showed a negative change in primary school enrolment. For example, the proportion of children enrolled in Zambia, Namibia and Zimbabwe has decreased by 42.1, 18 and 14.5 per cent respectively even if, on average, there is a general increase in primary school attendance for Group 1 countries. Thus, the result suggests that a high level of HIV/AIDS prevalence does impact primary level enrolment. Survey-level research in South Africa confirmed that the number of pupils enrolling in the first year of primary school in parts of KwaZulu-Natal Province was 20 per cent lower in 2001 than in 1998. In the Central African Republic and in Swaziland, school enrolment is reported to have fallen by 20-36 per cent due to AIDS and orphanhood, with girls being most affected.

This impact of HIV/AIDS on the demand side of education is also revealed in scatterplots 8 to 10 (see Annex 2) that show a negative relationship between AIDS and school attendance at both primary and tertiary level, and a flat relationship at secondary level.

7.9 Impact on health services

AIDS affects the health sector mainly by increasing the number of persons seeking health services, and through the costs of health care for AIDS patients. The rising demand for treatment of AIDS-related diseases leads to a shortage of hospital beds. The loss of hospital capacity is estimated to be in the order of 50 per cent in the most heavily affected countries (UN Population Division 2003). A study conducted in Rwanda found that HIV-positive outpatients visited a hospital 11 times on average, in contrast to less than once (0.3 times) for the general population (Nandakumar et al., 2000).

AIDS increases health expenditures in many countries. For example, a study in Zimbabwe showed that hospital care for HIV/AIDS patients was twice as expensive as that for non-HIV/AIDS patients. In Côte d'Ivoire, the Government allocated a budget of US\$636,000 for HIV/AIDS out of total Government expenditure for 1995 of US\$100 million (of which three-quarters was spent on care and one quarter on prevention), indicating that AIDS-related health expenditures already represented 8.5 per cent of total health spending (Koné et al., 1998). Moreover, a study in Rwanda reveals that annual per capita health expenditure in households was US\$63 for HIV/AIDS patients compared to US\$3 for households on average (Nandakumar et al., 2000).

7.10 Impact on agriculture

The economy of Africa is primarily agrarian. The consequences of HIV/AIDS for agriculture are the loss of labour supply and diminished labour productivity. A reduction in the agricultural labour force has significant effects on the size of harvests and so reduces household production and income, and inability to work or diversion of agricultural labour to care for sick household members reduces labour productivity

The agricultural labour force increased over the period in all countries except South Africa and Zimbabwe, both of which have high levels of HIV infection (see Table A5). In South Africa, the agricultural labour force fell from 1.9 million to 1.7 million over the period, a decrease of over 13 per cent. The far larger decline in Zimbabwe is due to the land reforms undertaken by the Zimbabwean Government as well as to the effect of HIV/AIDS. The data in the table suggest that countries with smaller changes in HIV prevalence (Groups 2 and 3) have higher increases in agricultural labour than Group 1 countries.

Studies suggest the general increase in the economically active population in agriculture in the other countries, despite the epidemic, may still cover a decline in the rate of increase of the agricultural labour force, particularly in the most affected countries. If these shortfalls in growth continue, there will be an eventual negative impact in the longer term. Indeed, according to projections for the agricultural labour force in nine high-prevalence countries, AIDS will reduce the labour supply by 2020 (FAO, 2000). If no action is taken some countries, for example Namibia, will lose a quarter of the labour force due to the pandemic, whereas in Botswana and Zimbabwe the loss will reach 23 per cent by 2020. Over the same period, Kenya, Tanzania and Mozambique will each lose well over a million workers from their agricultural labour force (see table 2 below).

Table 2: Impact of HIV/AIDS on the agricultural labour force in selected African countries, 1985-2020

	Namibia	Botswana	Zimbabwe	Mozambique	South Africa	Kenya	Malawi	Uganda	United Republic of Tanzania
HIV prevalence rate 2001	22.5	38.8	33.7	13.0	20.1	15.0	15.0	5.0	7.8
Projected loss in agric. LF (%)	-26.0	-23.0	-23.0	-20.0	-20.0	-17.0	-14.0	-14.0	-13.0
Projected number lost * (000)	62.7	58.0	624.5	1,186.0	383.0	1,287.6	439.3	897.0	1,256.6

* Calculated on the basis of the data provided by FAO

Sources: FAO 2000, UNAIDS 2002

The scatterplot 11 in Annex 2 shows the negative relationship between HIV/AIDS and the labour supply in agriculture.

With respect to agricultural productivity, labour remains an important component of productivity in Sub-Saharan Africa because of the generally limited use of machinery and the inability to purchase other farm inputs. As HIV/AIDS affects adults in their prime productive years, labour shortages can contribute to reduced productivity.

The figures in Table A5 show that productivity in the agriculture sector of all groups of countries increased over the period. South Africa (where mechanization may have

advanced more than in other countries) shows the highest increase, at more than 500 per cent, followed by Uganda and Sudan with 173 and 109 per cent increases respectively. Data are not available, however, for many countries, and no clear pattern emerges. It may furthermore be the case that the rate of increase in agricultural productivity is slower than it would have been in the absence of HIV/AIDS in some countries.

7.11 Skills profile

How HIV/AIDS affects the skills profile of the labour force is a key issue affecting a country's economic performance, as well as its labour costs. The socio-economic impact of HIV/AIDS is assumed to be greater for an economy if the epidemic affects skilled workers more than those with fewer skills. The debate on how AIDS has an effect on the skills profile is ongoing (Cohen, 2002). On the one hand, some studies argue that skilled workers are likely to be more susceptible than those who are unskilled. According to them, skilled workers with a high level of education are generally at higher risk of HIV transmission, essentially because improvements in socio-economic status (i.e. increasing disposable income) and changes in lifestyle that higher educational attainment make possible may be associated with behaviours that increase risk of HIV infection (UNAIDS, 1998). On the other hand, other research has found the highest HIV-infection levels among unskilled and semi-skilled workers, for economic reasons and also, it is argued, because higher levels of education may improve a person's ability to act on prevention messages (Bureau for Economic Research., 2001).

Thus, the level of education is probably a determining factor in explaining the skill profile of the workforce, although there is no simple correlation between educational levels and the distribution of HIV prevalence. A study conducted in developing countries found that prior to 1996, a higher level of education was associated with an increased risk of HIV transmission (Hargreaves, 2002). The pattern was, however, changing and there was now an increasing burden of HIV among less-educated persons in Uganda and Zambia. This result matches a similar study done in South Africa, in which higher prevalence rates were found at lower educational levels, with the exception of black Africans, where prevalence rates increased at matriculation level (Mandela/HSRC, 2002).

7.12 Type of contract / employment

According to the limited research available, contract workers who are engaged to work on a short-term and precarious basis have among the highest prevalence levels of HIV/AIDS. One study shows that, compared to permanent workers at all skill levels, contract workers had the highest overall rate of HIV infection (Evian et al., 2001). The difference is ascribed to high risk factors such as low skill levels, age, gender profile, and the seasonal or 'unstable' nature of contract employment which entails high levels of mobility.

7.13 Child labour

Child labour is a complex phenomenon, and HIV/AIDS is just one of several factors that contribute, but it is clear that the need for child labour may increase in countries experiencing severe HIV/AIDS epidemics. At the end of 2003, an estimated 12.1 million children in Sub-Saharan Africa had been orphaned due to the loss of one or both parents to AIDS. Nigeria accounted for about 2 million, followed by South Africa with more than one million orphans. Tanzania, Uganda and Zimbabwe were each estimated to have about a million orphans. Orphaned children, and those whose parents are already sick, often need to care for younger siblings and other family members as well as contribute to family

income, in addition to having to care for themselves. Exposed to the need to work without benefit of parental protection, they are vulnerable to exploitation. Table A5 shows a decrease in the child labour force over the period in all countries despite the change in HIV prevalence, largely due to the success of national programmes to reduce child labour and to raise school enrolment. The extent to which child labour would have declined further in the absence of HIV/AIDS is an unknown.

Although the effects do not appear at macroeconomic level, HIV/AIDS is generally considered likely to exacerbate the extent of child labour. One study conducted in Zambia concluded that HIV/AIDS increased the child labour force from 23 to 30 per cent (Mushingeh, A.C.S. et al. (ILO 2002). Other research in South Africa showed that about one-third of working children sampled for a survey had been orphaned by HIV/AIDS (Mturi and Nzimande, 2003). Yet another study in Tanzania investigated the level of child labour and found significantly more orphans than non-orphans engaging in paid labour. AIDS orphans were found to have rates of participation in paid labour an average of 9 per cent greater than non-orphans (Sulliman, 2003).

Conclusion and recommendations

This paper constitutes preliminary research on the impact of HIV/AIDS on the labour force, as very little is known to date about how the pandemic has affected the structure and composition of the economically active population. The research has focused on the impact of HIV/AIDS at aggregate level, which is difficult to measure since the effect of the pandemic starts at micro level (household and enterprises) and builds upwards. The study found that the macroeconomic impact of HIV/AIDS is not yet as visible with respect to all the labour force characteristics as one might imagine it would be.

Despite data limitations, the study permits a number of conclusions. HIV/AIDS has altered some of the main labour force characteristics of those countries most affected by the disease. Although the effect on the size of the labour force is not yet obvious in absolute values, HIV/AIDS has reduced the rate of growth of the economically active population. Although the effect on the total labour force participation rate is uncertain, the pandemic has modified the sex and age distribution of the labour force participation rate in severely affected countries. In these countries, the study tends to confirm the hypothesis regarding the decline of the male participation rates and a slight increase in female participation (suggesting the entry of widows into the labour market). With regards to the age distribution of labour force participation, 15-24 year olds recorded the highest increase in countries with high prevalence rates, confirming that young people tend to join the labour force to replace workers leaving it.

The sectoral impact of HIV/AIDS is mixed. While the educational impact is revealed through decreases in primary school enrolment for high-prevalence countries, the agricultural effect is not evident, even if the rate of growth of its labour force has declined.

In spite of there being no apparent pattern showing a negative effect of HIV/AIDS on unemployment and labour productivity, the study found that the average age of the labour force has reduced more significantly in the most affected countries. Indeed the average age in these economies showed a decline of nearly 4 per cent, from 34.1 to 32.8 years over the period 1986 to 2003.

The consequences of HIV/AIDS for child labour are not yet noticeable at the macro-level, although there is evidence from many small-scale studies.

The results of this research require further exploration with a more consistent database. In this regard, initial work on a new database encompassing both HIV/AIDS and labour market indicators for the period of interest (late 1970s to 2003) has begun. More information is needed on the social and economic costs of the HIV/AIDS epidemic. The paucity of current data is due in part to several overlapping problems: a lack of comprehensive and systematic data collection, problems with data collection methodology, and the insufficiency of micro-surveys undertaken. Much further work is required to improve the availability and quality of data on HIV prevalence and aspects of the labour force in regard to the informal and formal economies, persons in part-time and temporary employment, women and men, workers of different ages, occupation groups, labour productivity and sources of income. This would make it possible to shed more light on the relationship between HIV and labour force characteristics.

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Annex 1: Tables on changes in HIV prevalence rate and labour force characteristics, 1986-2003

Sources:

Adapted from ILO, various years; ILO, 2003; and National Labour Force surveys and censuses

Legend for tables:

AGRIC: Agriculture

AGE LF: Average age of the labour force

CHILD: Age group 0-14 years

EXPER LF: Average years of experience of the labour force

LF: Labour force

LFPR: Labour force participation rate

PRIMARY: Gross primary school enrolment

PROD: Labour productivity

PTRATIO: Pupil-to-teacher ratio

SECOND: Gross secondary school enrolment

TERTIARY: Gross tertiary school enrolment

UNEMP: Number of unemployed

UN RATE: Unemployment rate

YOUTH: Age group 15-24 years

na: not applicable

Table A1: Proportional change in labour force, age and years of experience, 1986-2003 (per cent)

Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)	TOTAL LF	YOUTH LF	AGE LF	EXPER LF
<i>Group 1: Countries with overall change of more than 11 per cent</i>				
Botswana	116.7	137.6	-4.7	-8.4
Swaziland	47.7	56.0	-1.3	-2.4
Lesotho	13.8	47.7	-5.5	-9.9
South Africa	119.0	128.7	-0.5	-0.8
Zimbabwe	67.3	108.9	-6.0	-10.7
Namibia	45.6	48.0	-1.3	-2.3
Zambia	112.1	137.1	-5.0	-9.2
Malawi	49.4	102.0	-9.7	-16.4
Mozambique	31.6	39.6	-2.0	-3.7
Central African Republic	51.3	61.7	-0.9	-1.6
Weighted average	77.3	99.8	-3.7	-6.5
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>				
Cameroon	68.7	84.2	-5.7	-9.9
Nigeria	50.7	123.9	-10.3	-17.2
Ethiopia	113.3	101.2	-6.5	-10.7
Côte d'Ivoire	67.2	85.2	0.1	0.1
Angola	44.0	53.5	-2.2	-4.0
United Republic of Tanzania	46.3	49.3	4.3	7.9
Congo	129.7	158.1	-4.1	-6.9
Burkina Faso	62.3	83.7	-6.8	-12.3
Rwanda	40.2	20.4	-5.5	-10.2
Burundi	24.2	28.6	-1.3	-2.5
Sudan	117.3	64.7	0.3	0.6
Weighted average	70.4	96.8	-5.8	-9.6
<i>Group 3: Countries with overall change of less than 2 per cent</i>				
Kenya	55.9	60.7	-0.5	-0.9
Sierra Leone	-3.7	-16.0	1.9	3.3
Ghana	92.7	135.8	-0.4	-0.6
Mali	96.5	142.4	-0.8	-1.5
Benin	51.9	61.2	5.7	10.5
Somalia	11.7	14.4	-1.2	-2.1
Senegal	59.7	63.9	-0.5	-1.0
Democratic Republic of Congo	20.6	16.9	2.1	3.8
Equatorial Guinea	37.0	41.3	-1.3	-2.2
Uganda	45.2	56.1	-1.1	-2.0
Weighted average	69.3	85.5	0.6	1.1

Table A2: Proportional change in age- and sex-specific participation rates, 1986-2003
(per cent)

Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)	Age groups					MALE LFPR	FEMALE LFPR
	15-24	25-34	35-54	55-64	15-64		
<i>Group 1: Countries with overall change of more than 11 per cent</i>							
Botswana	0.7	1.3	-4.6	-13.9	-2.2	-7.1	1.6
Swaziland	2.8	8.9	-2.3	-8.7	1.3	-5.0	1.3
Lesotho	11.3	4.5	-4.7	-6.6	4.7	-5.8	17.0
South Africa	26.3	9.7	4.9	-3.7	11.0	-1.7	8.7
Zimbabwe	17.6	1.4	-0.6	-1.4	11.7	6.6	-5.1
Namibia	-0.4	3.6	0.2	-4.2	2.0	-3.1	3.2
Zambia	26.7	38.3	28.4	-2.7	25.9	-3.0	97.5
Malawi	24.7	0.7	-0.2	-1.7	11.2	4.9	8.5
Mozambique	-1.2	-1.5	-0.6	-2.3	1.6	-2.2	1.6
Central African Republic	-0.8	-4.0	-1.1	-3.1	3.8	-4.1	-3.5
Weighted average	17.0	7.7	4.5	-3.0	10.2	-0.1	15.8
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>							
Cameroon	19.3	-2.8	-5.7	-4.3	8.4	10.5	6.5
Nigeria	83.9	4.2	3.2	-3.3	23.5	13.0	31.2
Ethiopia	32.7	18.5	10.4	-3.9	15.7	-7.3	27.0
Côte d'Ivoire	2.9	0.3	0.4	-3.4	5.0	-2.1	8.7
Angola	-1.5	-1.7	-0.9	-2.4	-0.4	0.2	-0.8
United Republic of Tanzania	-2.5	-2.2	-0.9	-2.0	2.0	4.0	0.3
Congo	96.1	1.9	0.0	-0.9	28.0	26.5	27.8
Burkina Faso	-6.8	1.2	1.1	-1.1	-0.5	-1.1	0.3
Rwanda	11.5	-2.7	-3.2	-15.0	-0.6	-4.7	-7.3
Burundi	-1.1	-0.9	-1.6	-1.9	-2.4	0.3	-4.3
Sudan	27.7	13.6	9.7	-8.1	22.0	15.9	37.6
Weighted average	44.7	6.0	3.7	-3.7	15.6	6.4	22.1
<i>Group 3: Countries with overall change of less than 2 per cent</i>							
Kenya	-2.6	-0.7	-0.2	-2.1	2.0	1.7	2.8
Sierra Leone	-32.6	-11.0	-11.1	-19.9	-13.9	-12.3	-16.0
Ghana	53.0	17.4	-0.1	27.0	34.7	33.4	35.7
Mali	20.1	22.7	21.3	19.2	22.6	1.4	-2.0
Benin	-3.5	5.3	-0.1	-1.0	1.0	3.5	-0.8
Somalia	-1.5	-1.8	-0.5	-2.5	1.7	2.6	0.6
Senegal	-3.2	-0.8	1.1	-9.6	-2.5	-2.8	-1.3
Democratic Republic of Congo.	-22.6	-11.6	-9.9	-13.9	-10.7	-8.4	-13.6
Equatorial Guinea	0.8	-2.1	-1.3	3.8	2.9	3.2	3.3
Uganda	-3.0	-1.8	-0.5	-1.6	0.8	0.9	0.7
Weighted average	0.5	0.4	-1.2	-0.4	3.7	3.5	1.4

Table A3: Proportional change in unemployment and productivity, 1986-2003 (per cent)

Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)	TOTAL UNEMP	YOUTH UNEMP	TOTAL UN RATE	PRODUCTIVITY
<i>Group 1: Countries with overall change of more than 11 per cent</i>				
Botswana	-2.6	41.2	-37.5	na
Swaziland	na	na	na	na
Lesotho	51.4	na	47.6	na
South Africa	3,590.9	96.8	79.9	-9.5
Zimbabwe	27.3	40.3	69.4	na
Namibia	140.4	169.3	77.9	na
Zambia	na	na	21.0	na
Malawi	na	na	na	na
Mozambique	na	na	na	na
Central African Republic	-7.9	4.0	na	na
Weighted average	2,036.7	77.6	57.5	na
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>				
Cameroon	na	na	na	na
Nigeria	3,172.9	na	na	12.6
Ethiopia	-54.4	-54.7	na	16.6
Côte d'Ivoire	24.8	na	na	-30.7
Angola	-72.6	na	na	na
United Republic of Tanzania	150.1	na	41.7	4.4
Congo	na	na	na	na
Burkina Faso	-79.3	na	na	na
Rwanda	-74.7	na	na	na
Burundi	na	na	na	na
Sudan	43.6	na	na	na
Weighted average	1,402.3	na	na	na
<i>Group 3: Countries with overall change of less than 2 per cent</i>				
Kenya	na	na	na	-15.6
Sierra Leone	na	na	na	na
Ghana	57.0	na	na	25.0
Mali	na	na	na	na
Benin	na	na	na	na
Somalia	na	na	na	na
Senegal	-0.2	na	na	na
Democratic Republic of Congo	na	na	na	-70.6
Equatorial Guinea	na	na	na	na
Uganda	506.7	na	311.1	na
Weighted average	na	na	na	na

Table A4: Proportional change in education indicators, 1986-2003 (per cent)

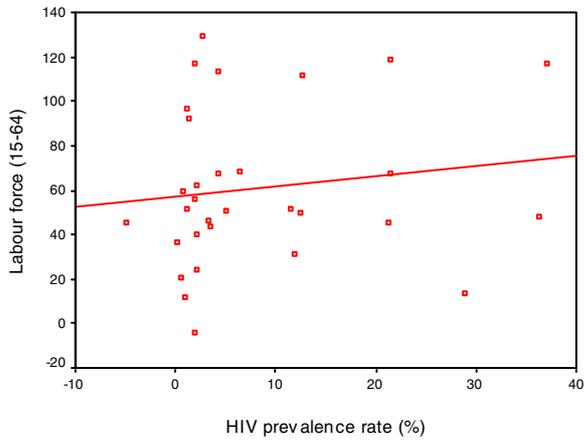
Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)	PTRATIO	PRIMARY	SECOND	TERTIARY
<i>Group 1: Countries with overall change of more than 11 per cent</i>				
Botswana	-16.8	-1.9	150.7	161.6
Swaziland	-1.7	-9.8	2.1	26.0
Lesotho	-14.5	11.4	44.5	85.6
South Africa	37.4	-13.5	16.3	10.8
Zimbabwe	6.4	-14.5	-13.4	-18.7
Namibia	na	-18.0	40.1	na
Zambia	13.9	-42.1	-43.5	-35.9
Malawi	-7.7	127.4	495.0	na
Mozambique	21.0	47.8	74.5	100.0
Central African Republic	12.0	-12.0	-88.2	58.3
Weighted average	16.7	17.4	91.7	22.9
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>				
Cameroon	19.7	4.4	43.1	135.6
Nigeria	-6.0	-6.9	na	na
Ethiopia	18.2	69.5	51.2	145.6
Côte d'Ivoire	20.9	12.0	17.8	169.2
Angola	12.5	-30.9	37.3	0.0
United Republic of Tanzania	33.3	0.4	18.4	133.3
Congo	-8.5	-42.0	-57.6	-41.5
Burkina Faso	-18.0	61.4	126.7	50.0
Rwanda	-12.7	34.9	197.7	201.9
Burundi	-8.5	85.4	129.0	325.0
Sudan	-23.1	13.8	51.4	na
Weighted average	3.4	14.5	49.1	105.9
<i>Group 3: Countries with overall change of less than 2 per cent</i>				
Kenya	1.1	1.0	32.7	120.2
Sierra Leone	28.9	84.9	53.2	61.0
Ghana	38.4	8.5	-4.7	129.5
Mali	65.9	132.9		173.3
Benin	46.3	79.2	118.3	33.3
Somalia	na	na	na	na
Senegal	5.1	33.5	34.4	na
Democratic Republic of Congo	-35.0	-33.4	-15.2	-41.7
Equatorial Guinea	na	na	na	na
Uganda	112.8	86.3	-84.0	305.3
Weighted average	26.8	28.0	-9.0	112.0

Table A5: Proportional change in agricultural sector and child labour force, 1986-2003 (per cent)

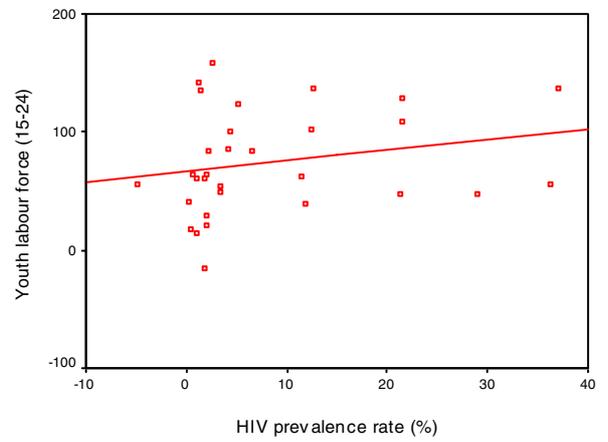
Countries grouped by overall change in prevalence 1986-2003 (countries in descending order of change in each group)	AGRIC PROD	AGRIC LF	CHILD LF
<i>Group 1: Countries with overall change of more than 11 per cent</i>			
Botswana	na	40.1	-30.5
Swaziland	na	14.2	-24.0
Lesotho	na	9.0	-14.2
South Africa	509.7	-13.3	na
Zimbabwe	-7.7	-87.2	-17.9
Namibia	na	25.9	-39.8
Zambia	5.6	37.4	-9.1
Malawi	34.5	41.8	-22.8
Mozambique	57.5	32.3	-9.5
Central African Republic	na	15.0	na
Weighted average	181.3	4.5	-16.3
<i>Group 2: Countries with overall change of 2 to 7 per cent</i>			
Cameroon	33.8	24.3	-19.9
Nigeria	61.5	4.7	-16.0
Ethiopia	na	41.6	-6.5
Côte d'Ivoire	30.2	16.7	-18.9
Angola	na	38.3	-8.4
United Republic of Tanzania	24.2	30.6	-14.7
Congo	na	31.9	-17.6
Burkina Faso	na	41.8	-31.2
Rwanda	-13.3	27.4	-2.2
Burundi	5.1	40.8	-2.1
Sudan	108.9	30.4	-15.1
Weighted average	56.4	22.0	-14.4
<i>Group 3: Countries with overall change of less than 2 per cent</i>			
Kenya	-20.5	37.7	-11.6
Sierra Leone	na	5.6	-21.7
Ghana	4.1	51.1	-21.0
Mali	16.2	34.3	-14.1
Benin	56.7	16.4	-8.7
Somalia	na	22.8	-11.1
Senegal	-77.6	39.1	-27.5
Democratic Republic of Congo	-17.5	40.3	6.1
Equatorial Guinea	na	29.0	-12.7
Uganda	172.9	43.9	-7.8
Weighted average	26.2	38.9	-8.5

Annex 2: Scatterplots of change in HIV prevalence rate and labour force characteristics, 1986-2003

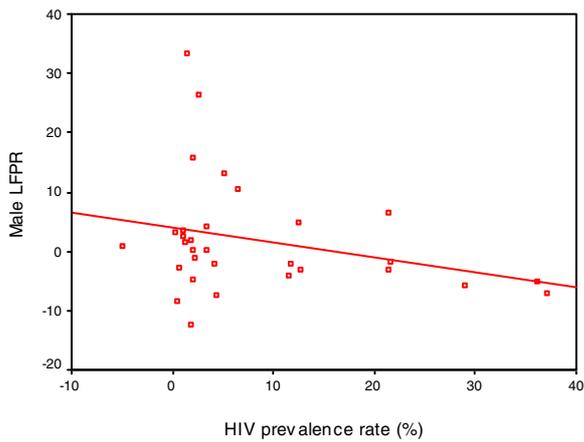
1. HIV/AIDS and total labour force



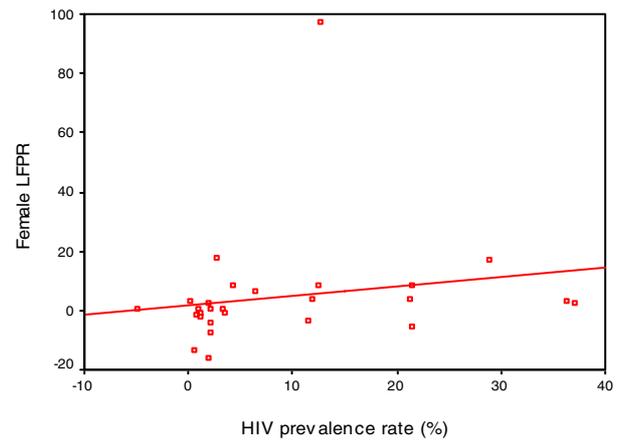
2. HIV/AIDS and youth labour force



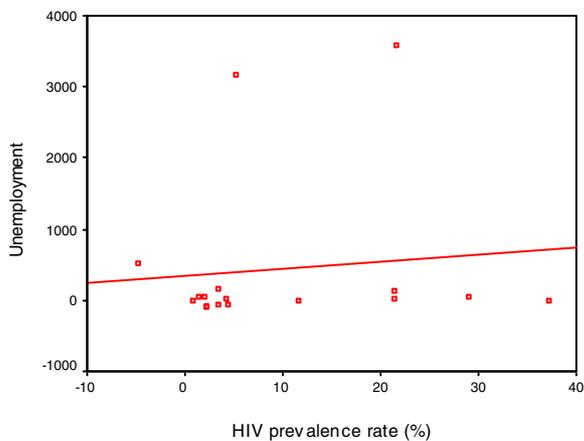
3. HIV/AIDS and male LF participation rate



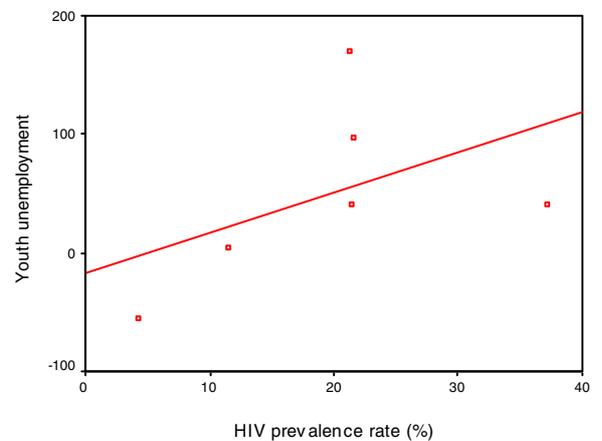
4. HIV/AIDS and female LF participation rate



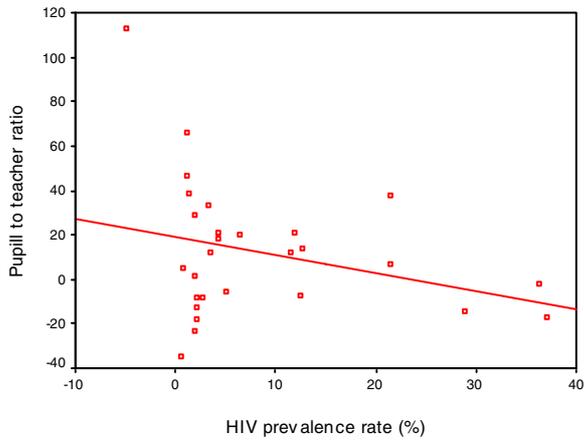
5. HIV/AIDS and total unemployed



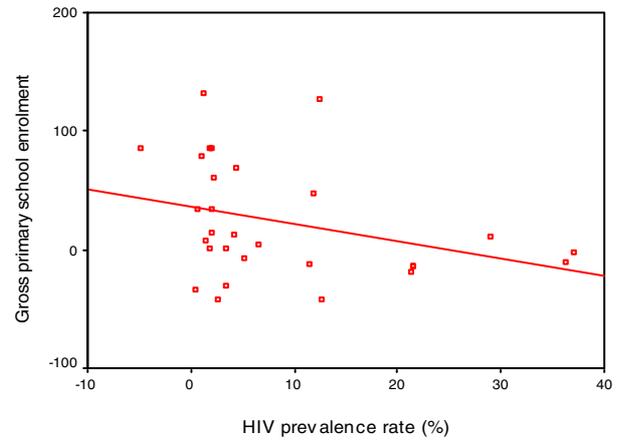
6. HIV/AIDS and youth unemployed



7. HIV/AIDS and pupil to teacher ratio

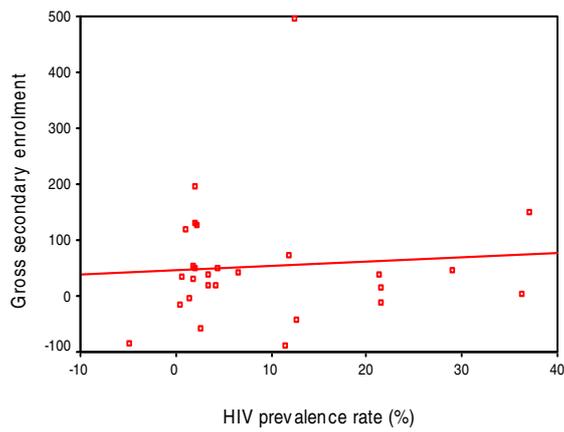


8. HIV/AIDS and primary school enrolment

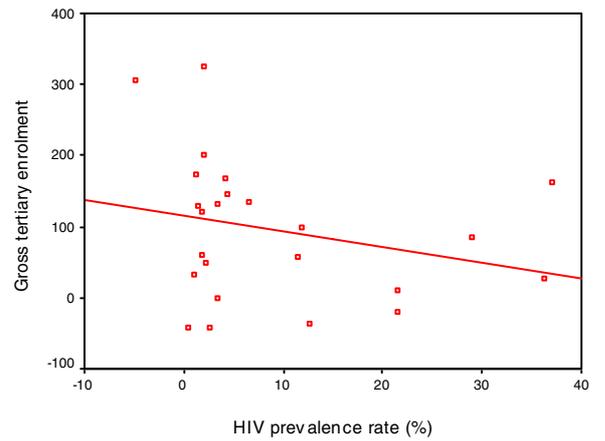


9. HIV/AIDS and secondary school

enrolment



10. HIV/AIDS and tertiary school enrolment



11. HIV/AIDS and agricultural labour force

