

Review

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The impact of HIV/AIDS on human development in African countries

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Abstract

Background: In the present paper, we consider the impact of HIV/AIDS on human development in African countries, showing that, beyond health issues, this disease should and must be seen as a global development concern, affecting all components of human development. Consequently, we stress the necessity of multidisciplinary approaches that model, estimate and predict the real impact of HIV/AIDS on human development of African countries in order to optimise the strategies proposed by national countries, international institutions and their partners.

Methods: In our search strategy, we relied on secondary information, mainly through National Human Development Reports of some African countries and regular publications released by the United Nations (UN), United Nations Development Programme (UNDP), World Health Organization (WHO) and the World Bank. We restricted ourselves to reports dealing explicitly with the impact of HIV/AIDS on human development in African countries.

Results and discussion: HIV/AIDS is affecting the global human development of African countries through its devastating impact on health and demographic indicators such as life expectancy at birth, healthcare assistance, age and sex distribution, economic indicators like income, work force, and economic growth, education and knowledge acquisition and other indicators like governance, gender inequality and human rights.

Conclusion: On the basis of the national reports reviewed, it appears clearly that HIV/AIDS is no longer a crisis only for the healthcare sector, but presents a challenge to all sectors. Consequently, HIV/AIDS is a development question and should be viewed as such. The disease is impeding development by imposing a steady decline in the key indicators of human development and hence reversing the social and economic gains that African countries are striving to attain. Being at the same time a cause and consequence of poverty and underdevelopment, it constitutes a challenge to human security and human development by diminishing the chances of alleviating poverty and hunger, achieving universal primary education, promoting gender equality, reducing child and maternal mortality, and ensuring environmental sustainability.

Background

Since 1990, five main composite indices were developed by the United Nations to measure the average achieve-

ments in basic human development (human development index (HDI), gender-related development index (GDI), human poverty indices (HPI-1 and HPI-2) and the

Table 1: Human Development Index 2006 [2]

High HD	Medium HD	Low HD
1. Norway	64. Libya	147. Togo
2. Iceland	57. Bulgaria	.
3. Australia	58. Malaysia	165. Zambia
4. Ireland	.	166. Malawi
5. Sweden	.	167. Congo
6. Canada	87. Tunisia	168. Mozambique
7. Japan	.	169. Burundi
8. United States	111. South Africa	170. Ethiopia
9. Switzerland	.	171. Chad
.	125. Botswana	172. Central African Rep
.	123. Morocco	173. Guinea-Bissau
.	124. Gabon	174. Burkina Faso
.	125. Namibia	175. Mali
		176. Sierra Leone
63. Mauritius	146. Swaziland	177. Niger

gender empowerment measure (GEM) [1]. HDI is the most used index, giving a summary measure of human development and allowing for a yearly comparison between countries around the world (Table 1) and indicating the relative ranking evolution in time of each country (Table 2) [2-4]. HDI is a three dimensional composite index obtained as a mean of three indicators weighed equally: health (life expectancy at birth), standard of living (GDP per capita) and education (literacy and enrolment).

In the present paper, we consider the impact of HIV/AIDS on human development in African countries, showing that, beyond health issues, this disease should and must be seen as a global development concern, affecting education and knowledge acquisition, income and social status, productivity and economic growth, and other direct and indirect components of human development such as gender equality and human rights. Consequently, we stress the necessity of multidisciplinary approaches that model,

estimate and predict the real impact of HIV/AIDS on human development of African countries in order to optimise the strategies proposed by national countries, international institutions and their partners.

Methods (search strategy)

In our search strategy, we relied on secondary information mainly through National Human Development Reports of some African countries and regular publications released by the United Nations (UN), United Nations Development Programme (UNDP), World Health Organization (WHO) and the World Bank. For national reports, we restricted ourselves to the eight National Human Development Reports which dealt explicitly with the impact of HIV/AIDS globally on human development, or partially on its components during the last years.

Results and discussion

Major infectious diseases

With malnutrition as a common contributor, the five biggest infectious killers in the world are HIV/AIDS, malaria, tuberculosis, acute respiratory infections and diarrhoeal disease, responsible for nearly 80% of the total infectious disease burden and claiming about 12 million people per year (Table 3) [5]. Despite the success of vaccination programs for polio and many childhood diseases, other diseases like AIDS, tuberculosis and malaria are still out of control in the majority of African countries. Children remain at high risk. Indeed, in 2002, of the 57 million deaths reported worldwide, 10.5 million deaths were among children of less than five years of age, of which 98% were in developing countries in general and in Africa in particular [6-9]. Consequently, while life expectancy at birth reached 78 years for women in developed countries, it fell back to less than 46 years in sub-Saharan Africa [10]. In the following sections, we concentrate on HIV/AIDS and its impact on human development in Africa.

Table 2: HD rank evolution of ten African countries [2]

Country	HD Rank 1990 (130 countries)	HD Rank 2000 (174 countries)	HD Rank 2006 (177 countries)
South Africa	62	103	121
Botswana	72	122	131
Lesotho	77	127	149
Zimbabwe	78	130	151
Zambia	87	153	165
Kenya	88	138	152
Cameroun	89	134	144
Namibia	96	115	125
Malawi	116	163	166
Swaziland	not ranked	112	146

Table 3: Main causes of mortality due to infectious diseases, 2001 (in million) [5]

Disease	Deaths per year (millions)
Respiratory infections	3.9
AIDS	3.0
Diarrhoeal diseases	1.9
Tuberculosis	1.9
Malaria	1.1

HIV/AIDS: the indomitable disease

Impact of HIV/AIDS on human development in selected African countries

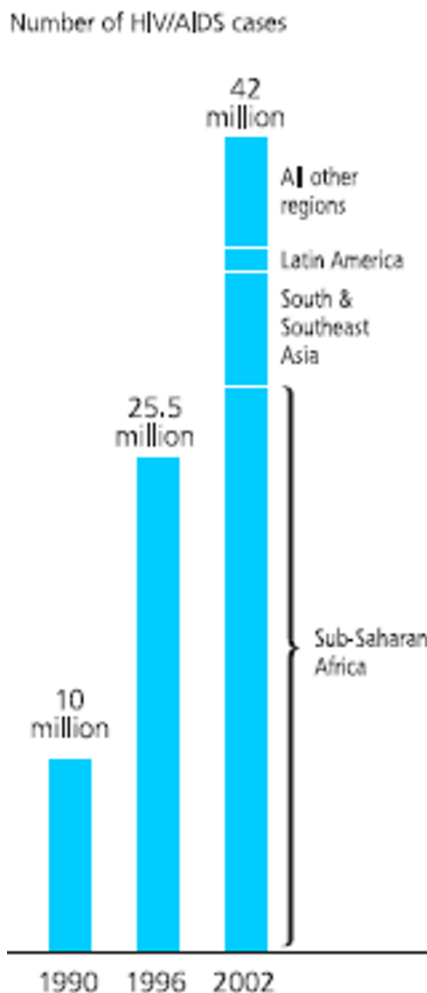
During the last decades, the prevalence and incidence of HIV/AIDS have seen an exponential growth (Figure 1). African countries are the most affected by this epidemic, which is strongly affecting all components of human development, as indicated explicitly by the set of national human development reports given below.

Zambia

The 2007 Zambia Human Development Report (HDR) focuses on the sixth Millennium Development Goal (MDG), which is combating HIV/AIDS, malaria and other diseases. Under the title "Enhancing household capacity to respond to HIV and AIDS" [11], it is indicated that HIV/AIDS is one of the major development challenges facing Zambia. According to this report, the epidemic has affected every fabric of human existence. It has become the major cause of illness and death among the young and middle-aged Zambians, who are the most productive age group. Consequently, it has deprived households and society of a critical human resource base (Table 4). Furthermore, it is reversing the social and economic gains the country is striving to attain. It has also continued to diminish the chances of alleviating poverty and hunger, achieving universal primary education, promoting gender equality, reducing child and maternal mortality, and ensuring environmental sustainability. In effect, HIV/AIDS is among the factors limiting the achievement of the MDGs.

Mozambique

Stressing the danger of the growing prevalence of HIV/AIDS (Table 5), the Mozambique National HDR 2007 states that the effects of HIV and AIDS are gradually hampering the capacity and the administrative and organizational power of the state [12]. The report considers that, globally, HIV/AIDS is a development question and should be viewed as such. More precisely, HIV/AIDS has unpredictable implications for economic and social sectors. Indeed, this epidemic is mainly concentrated on the active population, from 15 to 49 years of age. It thus has a disproportionate weight on the age groups who play a key



Source: Human Development Report.

Figure 1
Prevalence and incidence of HIV/AIDS: An exponential growth. The number of cases affected by HIV/AIDS worldwide has increased four-fold in 121 years.

role in the development of the economy and of the country's social sectors. AIDS does not only cause sickness, incapacity or death of workers, and severe emotional and economic upheavals for families, it also increases the cost of doing business. Analyses of the sector impact of HIV and AIDS in Mozambique have advanced predictions of economic catastrophe.

Kenya

Kenya National HDR 2006 has dealt with HIV/AIDS as a challenge to human security and human development [13]. As stressed by the report, despite Kenya's recent gains in reversing the trend of HIV/AIDS incidence and prevalence, the epidemic still presents a major challenge in the

Table 4: Zambia: life expectancy and HI with and without AIDS [11]

Province	Life expectancy With AIDS	Life expectancy Without AIDS	HDI With AIDS	HDI Without AIDS
Central	55.0	60.8	0.458	0.490
Copperbelt	57.6	63.2	0.552	0.583
Eastern	47.0	51.7	0.367	0.393
Luapula	47.5	51.2	0.385	0.405
Lusaka	54.1	62.5	0.513	0.560
Northern	45.5	55.8	0.384	0.441
Northern West	55.6	58.7	0.453	0.470
Southern	51.6	59.0	0.469	0.512
Western	48.2	52.6	0.386	0.410
National	52.4	57.5	0.469	0.491

country, threatening sustained progress in human development. It is also underlined that HIV/AIDS remains a serious concern, as patients can remain asymptomatic for many years, masking the reality that the virus could be spreading rapidly but silently across the country (Table 6).

Malawi

Under the title "reversing HIV/AIDS in Malawi", the Malawi HDR 2005 devoted a chapter to the impact of HIV and AIDS on households welfare, orphaned children, the extended family, educational and health sectors, agricultural production, business and public service delivery. The chapter concludes that HIV and AIDS have the potential to reverse those gains made in human development in the last few years [14].

Benin

According to the Benin HDR 2005, HIV/AIDS is at the same time a cause and consequence of poverty and underdevelopment [15]. According to this report, the impact of the disease on human capacities and institutions is the most apparent. It has repercussions for the economy, health systems, education and food security at national, regional and family levels.

The prevalence of HIV/AIDS varies according to different regions of Benin. The region with the highest prevalence has the lower life expectancy index (Table 7).

Table 5: Mozambique: comparison of regional and national HIV prevalence rates [12]

Year Region	2001	2002	2004
South	14.4	14.8	18.1
Centre	16.8	16.7	20.4
North	6.8	8.4	9.3
National	13.0	13.6	16.2

Zimbabwe

Zimbabwe HDR 2003 "towards reducing vulnerability: the ultimate war for survival", states that HIV/AIDS is impeding development by imposing a steady decline in the key indicators of human development. The report concludes that it is critical that the relationship between epidemic and human development be acknowledged at all levels and that the principles of sustainable development be a major focus and priority of the country's policies and programmes [16]. Zimbabwe is among the countries the most affected by HIV/AIDS. The high prevalence of the disease has significantly affected the country's human development. Indeed, from 1995 to 2000, HDI has declined by 12%, from 0.507 to 0.444 (Table 8).

South Africa

South Africa HDR 2003 indicates the magnitude and far-reaching consequences of the HIV/AIDS pandemic, stressing that the disease is no longer a crisis only for the health-care sector, but presents a challenge to all sectors [17]. The report discusses in detail the impact of the disease on economy and business, education and knowledge, health and social welfare. As illustrated in Figure 2, although at different levels, all South African provinces have seen a global decline in the human development index between

Table 6: Kenya: adult HIV prevalence by province and sex (%) (2004) [13]

Province	HIV+ (in thousands)	Male%	Female%	Total
Nairobi	159	7.1	10.9	9.0
Central	124	2.3	8.9	5.6
Coast	84	4.8	6.6	5.7
Eastern	90	1.4	5.9	3.7
North Eastern	17	2.1	4.0	3.0
Nyanza	292	10.2	16.0	13.1
Rift Valley	207	3.5	6.6	5.0
Western	85	3.6	5.4	4.5
National	1057	4.3	8.3	6.4

Table 7: Benin: HIV prevalence and life expectancy and education indices in different regions [15]

Indicators Region	HIV prevalence	Life expectancy index	Education index
Cuffo	3.3	0.547	0.372
Litteral	3.2	0.571	0.741
Oueme	3.1	0.568	0.551
Mono	2.4	0.581	0.578
Donga	1.2	0.588	0.398
Borgou	0.4	0.571	0.348
Alibori	0.3	0.524	0.352
National	2.0	0.569	0.431

1990 and 2000. HIV/AIDS has clearly contributed significantly to this decline.

Botswana

Under the title "Towards an AIDS-Free generation" [18], the Botswana HDR 2000 considered HIV/AIDS as the Antithesis of Human Development. The report indicated that Botswana's HIV prevalence rates suggest the emergence of an enormous human development crisis. Striking at the very core of human development, HIV/AIDS shortens human life, erodes people's sense of dignity and self-esteem, causes social exclusion, and traumatises and impoverishes individuals, families and whole communities (Table 9).

HIV/AIDS and human development in the most affected countries

As indicated in Table 2, Table 10 and Figure 3, between 1990 and 2006, the most affected countries lost years of life expectancy and tens of points in the human development ranking (South Africa 62/130 to 121/177, Zimbabwe 78/130 to 151/177, Botswana 72/130 to 131/177, Kenya 88/130 to 152/177, Zambia 87/130 to 165/177, Lesotho 77/130 to 149/177, Namibia 96/130 to 125/177 and Cameroon 89/130 to 144/177).

In 1999, the Commission on Macroeconomics and Health was established to explore the relationship between health and economic development. In the report published by the commission in 2001, empirical evidence was provided on how investing in health can achieve economic development and poverty reduction. It was indicated that, by 2010, eight million lives per year could be

saved by essential interventions against infectious diseases and nutritional deficiencies, resulting in economic benefits adding up to more than US\$ 360 per year by 2015 [21]. In order to address extreme poverty in its many dimensions, while promoting education, gender equality, environmental sustainability and global partnership for development, the United Nations (UN) Millennium Summit in 2000 [22] adopted the MDGs by fixing eight goals to be reached in 2015 (Table 11). Preventing the spread of HIV/AIDS, malaria, and other diseases is one of the goals, but it is striking to notice the impact that HIV/AIDS is having on each of the other seven goals.

However, beyond the international agreement on principles, at the 7-year juncture, most African countries, have made little (if any) headway in preventing and controlling the HIV/AIDS epidemics in particular, nor in reducing the rates of extreme poverty and making progress in the MDGs targeted for 2015 in general [23,24]. Meanwhile, it is sad to notice that in 1999, the governments of sub-Saharan Africa dedicated US\$7 billion to military spending, whereas diverting just 10% of this would have raised US\$700 million, more than enough to support the HIV/AIDS vaccine research program [25].

Sectorial impact of HIV/AIDS

Impact on health indicators

HIV/AIDS is directly affecting health and demographic indicators such as mortality rates, life expectancy, and sex and age distributions. By 2000-2005, Zimbabwe, Botswana, Swaziland and Lesotho have lost respectively 35, 28, 28 and 24 years of life expectancy [16,18-20]. More generally, it is estimated that, in the seven most affected

Table 8: Zimbabwe: overall, HDI has declined by 12%, from 0.507 to 0.444 between 1995 and 2000 [16]

Indicator Year	Life expectancy (Life expectancy index)	Adult literacy (Adult literacy index)	Income (Index)	HDI
1995	51.8 (0.45)	86 (0.86)	2162 (0.382)	0.507
2000	38.2 (0.22)	88.1 (0.88)	948 (0.375)	0.444

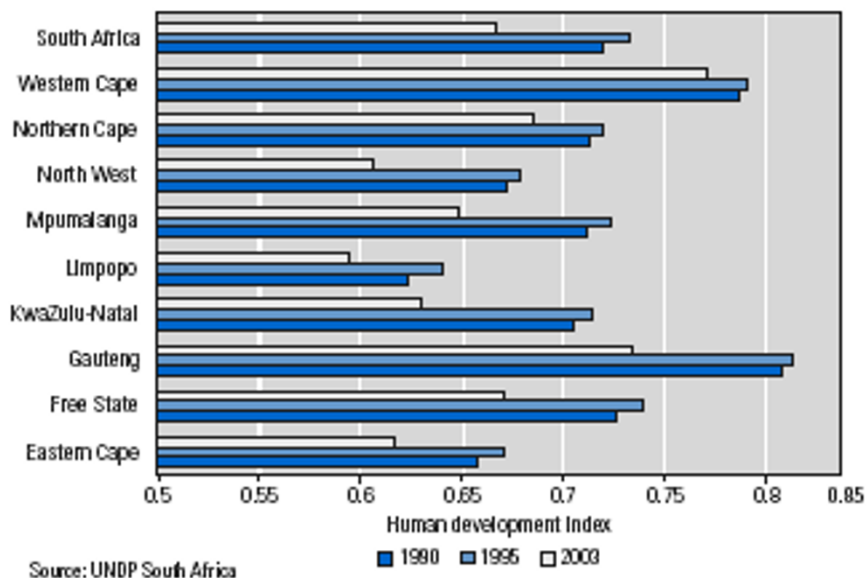


Figure 2
South Africa: Human development index (HDI) by province (1990-2003) [17]. The Human Development Index has decreased between 1990 and 2003 in all regions of South Africa.

countries in Africa, life expectancy declined by 12.1 years by 1995-2000 and is expected to decline by 29.4 years by 2010-2015. Similarly, the number of deaths, infant mortality rates and child mortality rates were estimated at 2, 10.2 and 28.6 respectively for the first period and expected to reach 6, 13.9 and 43.3 respectively by 2010-2015 [19]. Globally, in 1995-2000, 38 African countries had a mean life expectancy of 47 years, representing 5.7 years of loss attributable to AIDS.

The burden of the disease is not felt only at individual level; it affects households, communities and the whole nation (hospitalisation, healthcare, orphanhood) [12,15,17]. More than half of all hospital beds in sub-

Saharan Africa are occupied by people with HIV/AIDS and related diseases. Some of the most affected countries have lost more than 15% of their healthcare workforce due to AIDS and, in many other countries, midwives and health workers are living with HIV [11,14,16]. It should also be stressed that the HIV/AIDS epidemic worsens the situation of other diseases like cardiovascular diseases, diabe-

Table 9: The most affected African countries according to HIV prevalence in 2001 [19,20]

20% or more	10% to 20%	5% to 10%
Botswana 36.5%	Malawi 16.1%	Côte d'Ivoire 9.6%
Zimbabwe 33.9%	Kenya 15.0%	Rwanda 9.1%
Swaziland 33.7%	Centr Afric Rep 12.9%	Burundi 8.3%
Lesotho 30.1%	Mozambique 12.8%	Tanzania 7.8%
Namibia 22.2%	Cameroon 11.8%	Djibouti 7.1%
Zambia 21.6%		Congo 7.1%
South Africa 21.3%		Sierra Leone 6.7%
		Liberia 6.5%
		Ethiopia 6.5%
		Burkina Faso 6.4%
		Togo 6.0%
		Nigeria 5.8%
		Angola 5.5%

Table 10: Estimated and projected impact of HIV/AIDS on mortality indicators in the seven most affected countries in Africa [19,20]

	1995-2000	2010-2015
Life expectancy at birth(years)		
Without AIDS	62.3	67.0
With AIDS	50.2	37.6
Absolute difference	12.1	29.4
Number of deaths(millions)		
Without AIDS	3	3
With AIDS	5	10
Absolute difference	2	6
Infant mortality rate(per 1 000)		
Without AIDS	55.4	40.7
With AIDS	66.1	54.6
Absolute difference	10.2	13.9
Child mortality rate(per 1 000)		
Without AIDS	80.2	56.9
With AIDS	108.8	100.2
Absolute difference	28.6	43.3

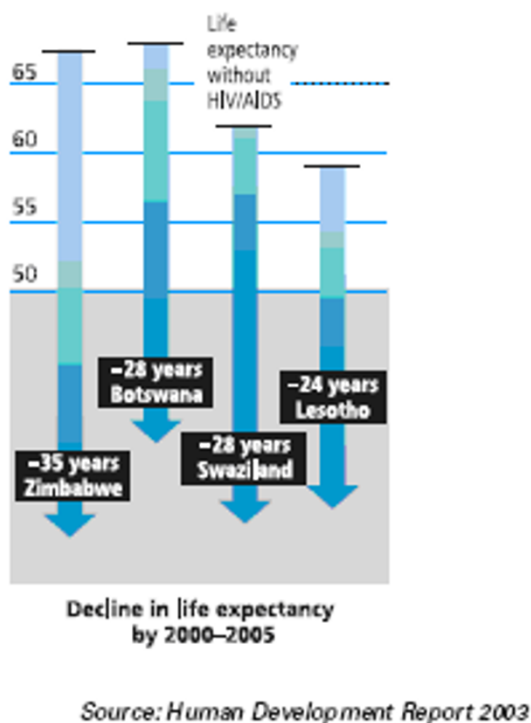


Figure 3
Loss of life expectancy due to HIV/AIDS in the most affected countries. The most affected countries by HIV/AIDS have lost tens of years of life expectancy.

tes and tuberculosis. For instance, 80% of tuberculosis patients are HIV positive in countries with high prevalence of HIV [19,20].

Impact on economic indicators

Contrary to the majority of diseases, HIV/AIDS kills and disables adults in the most productive part of their lives. Consequently, it is affecting business, investment, industry and agricultural sustainability, and ultimately reducing families' income and economic growth. Although at dif-

ferent degrees, all the national reports reviewed stress the negative impact of HIV/AIDS on income at individual, community and national levels [11-18].

At the moment, it is difficult to estimate precisely the real economic impact of HIV/AIDS on the whole African continent. However, many tentative estimates have been made. In 2000, the World Health Organization estimated a yearly reduction of 1% of the GDP in the most affected African countries. In 2002, UNAIDS gave a much higher estimation of 2.6%. According to the Macroeconomics and Health Commission, in 2001, the cost of HIV/AIDS was between 11.7% and 35.1% of the Gross National Product in Africa [19]. For South Africa, the World Bank predicts that in 2010, the GDP would be 17% lower than it would be without HIV/AIDS [26]. The loss of labour force is indisputable, though it is not directly perceived by employers because it is essentially comprised of non-qualified workers who can easily be replaced from the large reservoir of unemployed. However, according to FAO estimates, by 2020, the projected agricultural labour force would be reduced by at least 10% in 12 countries and by 20% or more in five countries (Namibia, Botswana, Zimbabwe, Mozambique and South Africa). By 2020, the loss of general work force is thought to reach 30% in four countries, 10 to 30% in 14 countries and 10% in 16 other countries (Figure 4) [27].

These partial and sometimes controversial estimates, combined with the paucity of national data, indicate the necessity of global interdisciplinary studies that can model, estimate and predict the economic impact of HIV/AIDS in Africa.

Impact on education and knowledge acquisition

As stressed in the MDGs, education is essential for human development and needs to be enhanced especially in low- and medium-income countries. Unfortunately, HIV/AIDS is reversing the trend towards the achievement of universal primary education in most African countries. In Africa,

Table 11: The Millennium Project [22]

Millennium Development Goals	UN Millennium Project task forces
1. Reduce extreme poverty and hunger by half relative to 1990	1. Poverty and economic development
2. Achieve universal primary education	2. Hunger
3. Promote gender equality & empowerment of women	3. Education and gender equality
4. Reduce child mortality by two-thirds relative to 1990	4. Child and maternal health
5. Improve maternal health, including reducing maternal mortality by three-quarters relative to 1990	5. HIV/AIDS, malaria, tuberculosis, and access to essential medicines
6. Prevent spread of HIV/AIDS, malaria, and other diseases	6. Environmental sustainability
7. Ensure environment sustainability	7. Water and sanitation
8. Develop a global partnership for development	8. Improving the lives of slum dwellers
	9. Trade
	10. Science, technology, and innovation

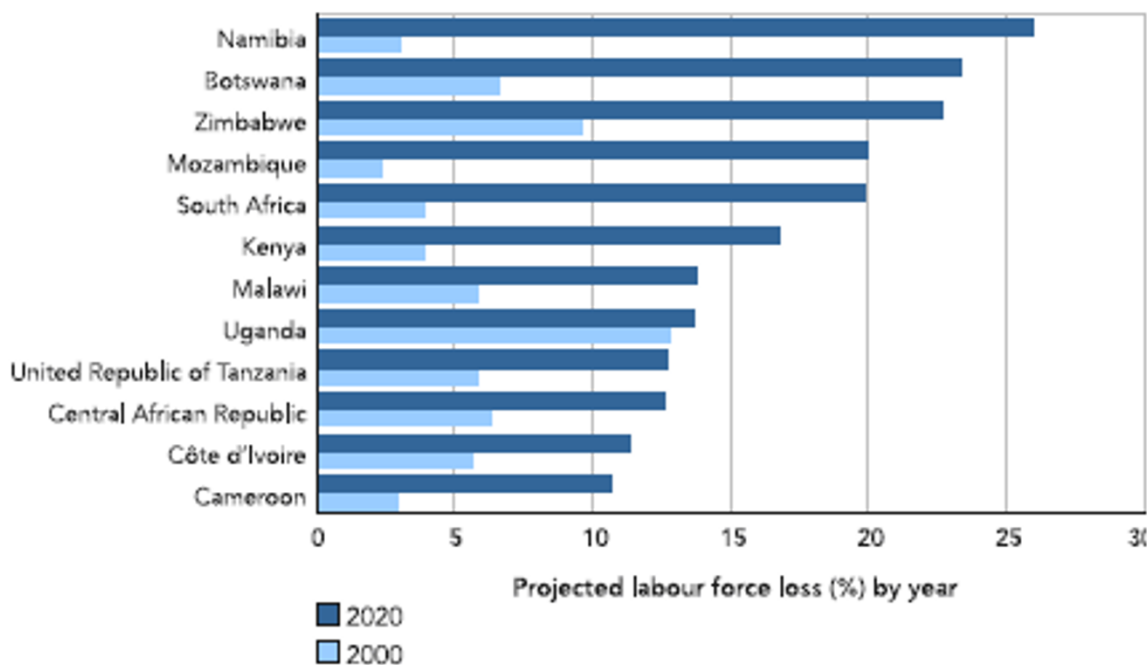


Figure 4
Reduction in African agriculture labour force due to HIV/AIDS, as estimated in 2000 and projected for 2020. If the present trend is maintained, by 2020, HIV/AIDS will have caused more than 25% reduction in agriculture labour force in some African countries

less than 65% of children are enrolled in primary school [28,29] and thousands of enrolled children will prematurely leave school under the pressure of HIV/AIDS, including orphans, impoverished and those who withdraw to look after ill members of their families. In Kenya, in 2004, 48% of all orphans were due to AIDS (Figure 5) [12]. More generally, during the period 1999-2004,

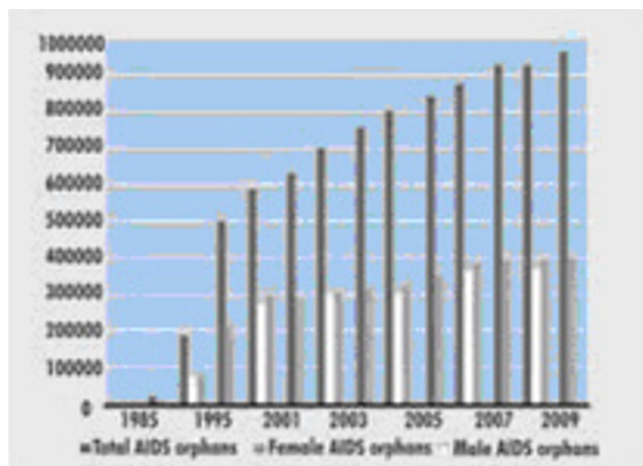


Figure 5
Kenya: Number of orphans by type. Beyond death and disability, a large number of orphans are caused by HIV/AIDS.

orphans children represented 12.3% of all children under the age of 18 in sub-Saharan Africa and the percentage of child labour reached 31.5%, 35.5% and 41% in sub-Saharan Africa, Eastern and Southern Africa, and West and Central Africa respectively [22]. The negative impact of HIV/AIDS can partially be evaluated through the impact of orphan-hood on school attendance among 10-14 years-olds (Table 12). More globally, the disease is seen to have a threefold impact on education. It affects the cognitive ability of children, the capacity of teachers and the efficiency of staff and managers. For instance, HIV prevalence among South African teachers reaches 21% among those aged 25-34 and 13% among those aged 35-44, whereas in the Zambian school system, over 60% of teacher absence is due to HIV/AIDS (illness, care for ill family members, family funeral, etc.) [12,15,17,20].

Conclusion

On the basis of the national reports reviewed, it appears clearly that HIV/AIDS is no longer a crisis only for the healthcare sector, but presents a challenge to all sectors [17]. Consequently, HIV/AIDS is a development question and should be viewed as such [12]. The disease is impeding development by imposing a steady decline in the key indicators of human development and hence reversing the social and economic gains that African countries are striving to attain [11,16]. Being at the same time a cause

Table 12: Impact of orphanhood on school attendance among 10-14 years-olds (%)

Percentage in school	West: 9 countries	Central: 6 countries	Eastern: 9 countries	Southern: 10 countries	All: 34 countries
Non-orphan	67	75	70	88	74
Orphan	58	69	54	84	69
Double orphan	57	58	49	80	64
Ratio double vs. non orphan	.86	.94	.72	.90	.87

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and consequence of poverty and underdevelopment, it constitutes a challenge to human security and human development by diminishing the chances of alleviating poverty and hunger, achieving universal primary education, promoting gender equality, reducing child and maternal mortality and ensuring environmental sustainability [11,13,15,18]. Shortening human life, eroding people's sense of dignity and self-esteem, causing social exclusion, and traumatising and impoverishing individuals, families and whole communities, HIV/AIDS has the potential to reverse those gains made in human development during the past few years [14,18]. With unpredictable implications for economic and social sectors, it is critical that the relationship between HIV/AIDS and human development be acknowledged at all levels and that the principles of sustainable development be a major focus and priority of the African countries' policies and programmes [12,16]. The danger and complexity of this disease imposes the necessity of multidisciplinary approaches that model, estimate and predict the real impact of HIV/AIDS on human development of African countries in order to optimise the strategies proposed by individual countries, international institutions and their partners [30].

Limitations of our search

We are aware of the importance of the topic considered in this paper and the necessity to deal with it seriously and precisely. However, our search relied only on published data by different African countries and international institutions. Consequently, we were limited to data and the numbers available and this may be frustrating not to give a complete panorama of this interesting subject.

Dedication

This paper is dedicated to African children afflicted by poverty and HIV/AIDS epidemics.

Competing interests

The author declares that they have no competing interests.

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