



IMF Policy Discussion Paper

Providing Health Care to HIV Patients in Southern Africa

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Research Department

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Abstract

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The paper provides an economic analysis of the impact of HIV/AIDS on the health sector in Southern Africa. It provides indicators for the scale of the impact, including estimates of the costs of various forms treatment. In anticipation of increasing numbers of patients with HIV/AIDS-related diseases, it is essential to expand the already strained health facilities and to substantially increase the training of health personnel. While proposed reductions in the prices of antiretroviral therapies will considerably expand the range of those who can afford them, they will remain accessible to a minority of the population only.

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I. INTRODUCTION

Southern Africa is the region with the highest rates of HIV infection in the world.² The Joint United Nations program on HIV/AIDS, UNAIDS, estimate that 11.3 million, out of a total population of 97 million, were HIV infected in 1999. The adult HIV prevalence rate ranges from about 8 percent in Tanzania to 36 percent in Botswana (see Table 1).

Table 1. HIV prevalence in Southern Africa

	Total popu- lation, 1999 (in thousands)	People living with HIV/ AIDS, 1999 (in thousands)	Adult HIV prevalence rate, 1999 (in percent)	Estimated AIDS deaths, 1999
Botswana	1,592	290	35.8	24,000
Lesotho	2,108	240	23.6	16,000
Malawi	10,674	800	16.0	70,000
Mozambique	19,222	1,200	13.2	98,000
Namibia	1,689	160	19.5	18,000
South Africa	39,796	4,200	19.9	250,000
Swaziland	981	130	25.3	7,100
Tanzania	32,799	1,300	8.1	140,000
Uganda	21,209	820	8.3	110,000
Zambia	8,974	870	20.0	99,000
Zimbabwe	11,509	1,500	25.1	160,000
Southern Africa	96,545	11,310	18.0	992,100
Sub-Saharan Africa	596,272	24,500	8.6	2,200,000
Global total (excluding sub-Saharan Africa)	5,362,577	9,800	0.2	600,000

Data source: UNAIDS (2000).

A comprehensive strategy for coping the epidemic would be based on improved prevention efforts to reduce the rate of new infections, as well as an expansion of existing health services to provide care to HIV patients. The aim of the present study is more modest, evaluating the impact of the HIV/AIDS epidemic on the provision of health services, and highlighting some of the obstacles that need to be addressed in order to improve the quality of health services in the region.³

² For the purpose of this study, Southern Africa comprises Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Uganda, Tanzania, Zambia, and Zimbabwe.

³ For a broader study of the demographic and economic impact of HIV/AIDS in Southern Africa, see Haacker (2001).

Section II provides some indicators for the quality of health services in the countries covered, such as spending on health services and the availability of health staff and health facilities. Section III analyzes the impact of HIV/AIDS on the health sector, addressing the demand on existing health facilities, the toll of HIV/AIDS on health sector personnel, the costs of providing basic health services to HIV patients, and the scope for improving access to highly active antiretroviral therapies (HAARTs). Section V summarizes and concludes.

II. THE HEALTH SECTOR IN SOUTHERN AFRICAN COUNTRIES

The ability of the health sector to cope with the HIV/AIDS epidemic depends on the available resources. Table 2 provides several indicators for the quality of health services in Southern Africa. Total health expenditure per capita ranges from US\$ 9 (for Malawi) to US\$ 203 (for South Africa), corresponding to between 0.2 percent and 4.1 percent of the per capita spending for the United States. These differences in spending on health services across countries mainly reflect differences in GDP per capita. As a percentage of GDP, health expenditure ranges from 3.4 percent (for Swaziland) to 7.5 percent (for Namibia), which compares to a level of 5.8 percent (for the UK) and 13.7 percent (for the U.S.).

If the purchasing power of the US dollar differs across countries (owing to lower prices for services and nontraded goods in lower-income countries), health spending in terms of US\$ is not a good indicator for the quality of services. At purchasing power parity (PPP) exchange rates, total health expenditure per capita ranges from US\$ 45 (for Malawi) to US\$ 552 (for South Africa), corresponding to between 0.9 and 11.1 percent of U.S. per capita health expenditure (see Table 2).⁴

However, these data on health expenditure are likely to understate the quality of health services compared to industrialized countries, for three reasons: (1) Generally, a disproportionate share of health expenditure is accounted for by older people, whereas the

⁴ PPP exchange rates also have the advantage that they respond less to short-term fluctuations of the nominal exchange rate. It is important to bear in mind, though, that PPP exchange rates are estimated based on the prices of a bundle of goods and services that may differ from goods and services relevant for the health sector.

age distribution of Southern African countries is tilted towards the young. (2) The numbers may exclude the informal sector, especially traditional healers who are very important in rural areas. (3) Those who can afford it, may seek the most advanced (and costly) services abroad; the national data would not capture these outlays.

Table 2. Indicators for the quality of health services in Southern Africa

	Total health expenditure per capita			Physicians	Nurses	Hospital Beds	Access to essential drugs
	In U.S. Dollars, 2000	In PPP U.S. Dollars, 2000	In percent of GDP, 1997	Per 100,000	Per 100,000	Per 1,000	In percent
Botswana	155.0	398.1	4.2	23.8	219.1	1.6	90
Lesotho	21.0	88.8	5.6	5.4	60.1	1.1	80
Malawi	8.9	44.8	5.8	3.0	n.a.	1.3	n.a.
Mozambique	12.7	55.4	5.8	3.0	n.a.	0.9	50
Namibia	113.7	394.1	7.5	29.5	168.0	0.3	80
South Africa	203.0	552.3	7.1	56.3	471.8	0.8 1/	80
Swaziland	42.6	129.6	3.4	15.1	n.a.	0.7	n.a.
Tanzania	13.0	30.2	4.8	4.1	85.2	0.9	n.a.
Uganda	11.7	56.5	4.1	n.a.	18.7	0.9	70
Zambia	19.8	58.7	5.9	6.9	113.1		n.a.
Zimbabwe	33.2	127.0	6.2	13.9	128.7	0.5	70
Memorandum Items							
United Kingdom	1,398	1,384	5.8	164.0	497.0	4.2	n.a.
United States	4,956	4,956	13.7	279.0	972.0	3.7	n.a.

Data sources: Cols. 1-2 are extrapolations for 2000, using 1997 WHO data on expenditure shares (col. 3) and World Bank estimates of PPP exchange rates. WHO Estimates of Health Personnel for cols. 4-5, most data refer to 1995 or 1996. For Malawi and Mozambique, the data on health personnel are from World Bank, *World Development Indicators*, 2001. World Bank, various sources and South African Ministry of Health for col. 6. World Bank, *World Development Indicators*, 2001, for col. 7. 1/ Public hospitals only.

An alternative indicator for the quality of health services is the availability of skilled staff. The best trained health personnel, physicians⁵, is extremely scarce for the poorest countries in the region. For Malawi and Mozambique, the countries with the lowest share of physicians in the population (about 3 formally trained physicians per 100,000 people), the availability is only about 1 percent of the level for the United States.

In interpreting these numbers, it is important to bear in mind that in the poorer countries, a larger range of health services is provided by staff who are not formally qualified as physicians. As a consequence, the ratio of nurses to doctors in the formal

⁵ Defined as health personnel who have completed a degree of sufficient duration.

health sector ranges from 10-20 in Southern Africa, whereas a ratio of 3-4 would be more common for industrialized countries. As the data on health sector personnel are based on formal qualifications and/or employment, they are also most likely to exclude the informal sector.

Additionally, Table 2 provides data about the number of hospital beds and the access to essential medicines. The availability of hospital beds may serve as an additional indicator for the availability of more intensive forms of care (as HIV patients would require in the final stages of the disease). While access to essential drugs in Southern Africa is better than for many other sub-Saharan countries, the data show that significant proportions of the population in the countries covered would not have easy access even to the most basic medications for AIDS-related diseases.⁶

Table 3 summarizes available information on the financing of health expenditure. The share of public vs. private health expenditure does differ considerably across countries, with public health expenditure accounting for between 35 percent and 73 percent of total health expenditure. Virtually all public health expenditure is financed by taxation; public health insurance does not play a significant role in any of the countries covered. While some of the countries with high rates of private health expenditure feature some form of private health insurance, the share of out-of-pocket health expenditure (as a proportion of total health expenditure) is relatively high in an international context. For 6 of the 11 economies covered, private health insurance accounts for less than 10 percent of private health expenditure.

⁶ Access to essential drugs is defined as the percentage of the population with access to at least 20 drugs from the WHO's list of essential drugs within one hour's walk. The list does include several drugs used to treat opportunistic diseases associated with AIDS.

Table 3. The financing of health services in Southern Africa, 1997
(In percent of GDP)

	Total	Public	Private Total	Private Out of pocket	Private Private insurance and other private
Botswana	4.2	2.6	1.6	1.5	0.1
Lesotho	5.6	4.1	1.5	1.5	0.0
Malawi	5.8	3.4	2.4	2.1	0.2
Mozambique	5.8	4.1	1.7	1.1	0.5
Namibia	7.5	3.9	3.6	3.6	0.0
South Africa	7.1	3.3	3.8	3.3	0.5
Swaziland	3.4	2.5	0.9	0.9	0.0
Tanzania	4.8	2.9	1.9	1.9	0.0
Uganda	4.1	1.4	2.7	2.0	0.7
Zambia	5.9	2.3	3.6	2.5	1.1
Zimbabwe	6.2	2.7	3.5	2.4	1.1

Data source: World Health Organisation. Data for Lesotho, Mozambique, South Africa, and Zimbabwe are classified as "complete with high reliability". For the other countries, the data are classified as "incomplete with medium to high reliability". Data may not add up exactly due to rounding.

III. THE IMPACT OF HIV/AIDS ON THE HEALTH SECTOR

The HIV/AIDS epidemic has an immediate effect on the health sector, increasing the demand for public and private health services and, at the same time, taking its toll on health sector personnel. This section first summarizes the available information on the HIV-related demand for health facilities and personnel, using indicators such as hospital occupancy rates or the ratio of trained health personnel to HIV patients. It then provides estimates of the costs of treating HIV patients, based on estimates of the costs and on assumptions about coverage rates of certain services. As there are some special issues regarding the provision of highly active antiretroviral therapies, this is discussed in a separate subsection.

The impact on existing health facilities

Very little data are available on the numbers of HIV positive patients or on actual expenditure for the treatment of HIV/AIDS related diseases. A number that is sometimes reported are hospital bed occupancy rates. A survey of various websites and news agencies suggests that the share of hospital beds occupied by patients with HIV/AIDS related diseases ranges from 30 to 80 percent (see Table 4); and the World Bank estimates that the number of hospital beds needed for AIDS patients will exceed the total number of beds

available now in Botswana by 2002, in Namibia by 2005, and in Swaziland by 2004.⁷ Especially for the worst hit countries, hospital occupancy rates may understate the impact on health facilities, as hospitals may operate above capacity.

As shown above (in Table 2), the availability of physicians and other trained health staff is rather low in some countries of the region. As a consequence, health staff struggle to cope with the very high numbers of patients with HIV/AIDS related diseases. If, for example, 10 percent of those infected would need the services of a physician, then the ratio of HIV-positive patients to physicians would range from 17 (for South Africa) to 250 (for Malawi).⁸ Interpreting these numbers, however, it is important to bear in mind that the coverage of health facilities is uneven. The supply of health services tends to be better in the capitals and some larger cities, whereas access even to the most basic services is limited in rural areas.⁹

Table 4. The impact of HIV/AIDS on the health sector (I)

	Mortality, all ages, 2000		Mortality, all ages, 2010		Hospital beds occupied by HIV patients, various years (In percent)	AIDS patients per physician
	Total	Of which: AIDS	Total	Of which: AIDS		
Botswana	2.2	1.7	3.6	3.1	60-70	96
Lesotho	1.5	0.6	2.5	1.7		228
Malawi	2.2	1.0	2.4	1.4	30-80	250
Mozambique	2.3	0.9	3.0	1.8	30	208
Namibia	1.9	1.2	2.9	2.3		41
South Africa	1.5	0.7	3.0	2.3	26-70	17
Swaziland	2.0	1.0	3.2	2.4	50	120
Tanzania	1.3	0.5	1.3	0.7	40-70	97
Uganda	1.8	0.6	1.5	0.6	50	n.a.
Zambia	2.2	1.3	2.1	1.3	60-80	108
Zimbabwe	2.2	1.7	3.2	2.7	50-80	87

Data sources: U.S. Bureau of the Census for cols. 1-4. The estimates in col. 5 have been obtained from various websites and news agencies. See text for col. 6.

⁷ See the relevant Worldbank country studies listed under references.

⁸ The ratio of 10 percent is used for illustrative purposes.

⁹ See, for example, Table 2 for access to essential drugs.

As the demand for health services expands, employees in the health sector are also affected by the disease. Assuming that HIV prevalence rates for health sector staff are similar to those of the general population, Haacker (2001) shows that training of doctors and nurses would have to be expanded by about 25-40 percent over the 2000-10 period, if the countries covered here were just to keep the numbers of doctors and nurses constant.¹⁰ Increasing workloads and the risk of infection also deters health personnel from working in the areas worst affected by HIV/AIDS, and increases the incentives for emigration, possibly exacerbating brain drain.

Available demographic projections indicate that the situation in the health sector is likely to deteriorate further (compare Table 4). For the year 2000, between 39 and 75 percent of all deaths in the countries surveyed were AIDS-related, with mortality rates of between 1.3 and 2.3 percent (for Tanzania and Mozambique, respectively).¹¹ Following the dramatic increase in HIV prevalence rates in recent years in most of the countries covered here, the numbers of AIDS cases and of AIDS deaths is projected to rise further for most countries in the region (see Table 4). For South Africa, for example, mortality rates are expected to double between 2000 and 2010 (from 1.5 percent to 3.0 percent), reflecting an increase in AIDS-related mortality from 0.7 percent to 2.3 percent. As a consequence, the demand for health facilities and trained health personnel, as well as the losses of trained health staff due to AIDS, will increase substantially for most of the countries covered over the coming years.

The costs of prevention of opportunistic diseases and basic treatment

There are two ways of obtaining estimates of and projections for the costs of treating HIV patients: (1) Using data on total HIV-related spending for a country, and deriving the costs per patient from this. (2) Using case studies to obtain estimates of the costs of treatment per patient, and deriving estimates of the total required spending from this. In the literature, this latter approach is referred to as “scaling up”. As data on aggregate HIV-

¹⁰ This study focuses on the countries covered here, less Uganda and Tanzania.

¹¹ Assuming that those who have died of AIDS would have survived otherwise.

related spending are not generally available for African countries, most studies follow the scaling-up approach. This approach also has the advantage that the estimates of HIV-related costs are based on some common criteria and are comparable across countries. However, the scaling-up method is weak in identifying overhead and fixed costs, such as the share of the costs of administering a hospital that could be attributed to the treatment of HIV patients, or the capital costs of building a new hospital to accommodate the rising number of HIV patients. Scaling up requires estimates or targets for the coverage of health services to HIV patients. The coverage even of the most basic health services is limited in several Southern African countries (see Table 2), and only a very small proportion of HIV patients receive antiretrovirals. Thus, estimates of the costs of treating HIV patients based on scaling-up are based on a judgement of which rates of coverage are feasible.¹²

A recent study by the World Bank summarizes the available data on the costs of various forms of care to HIV patients, including highly active antiretroviral treatments (HAARTs).¹³ Their estimates are summarized in Table 5.

Table 5. The costs of treating HIV patients

	Costs per patient per year	
	Low-Income Countries	Higher-Income Countries
Palliative care	\$ 25.80	\$ 25.80
Prevention of opportunistic infections	\$ 36	\$ 79
Clinical treatment of opportunistic infections	\$ 359	\$ 698
Costs of HAARTs (drugs only)	\$ 1,400	\$ 1,400
Costs of HAARTs (support)	\$ 600	\$ 1,000

Data sources: Bonnel, *Costs of Scaling HIV program activities*, 2001. For palliative care, prevention of opportunistic infections, and treatment of opportunistic infections, table 5 reports data from a medium cost scenario. For highly active antiretroviral therapy, it reports low cost estimates. Botswana, Namibia, South Africa, and Swaziland are classified as higher-income countries.

¹² See Bonnel, *Costs of Scaling HIV Program Activities*, 2001, for a thorough discussion of this method.

¹³ See Bonnel, *Costs of Scaling HIV Program Activities*, 2001.

Table 6 uses these estimated costs of treatment per patient to obtain estimates of the impact of HIV/AIDS on the health sector, excluding, for the moment, highly active antiretroviral therapies. These estimates are based on the assumption that patients would, on average, require health services through the last three years of their lives. For all countries, the estimates are based on the assumption that the coverage rate for palliative care and prevention of opportunistic diseases is 30 percent, and that the coverage rate for clinical treatment of opportunistic diseases is 20 percent. As actual coverage rates for the respective countries may differ from those assumed, these estimates should not be interpreted as actual costs. Rather, they provide an indicator for the demand for HIV-related health services that is consistent across countries. (If desired, it can easily be scaled up or down to allow for different coverage rates). Also, the estimates do not include investments in health facilities that may be required to achieve the assumed coverage rates.

Table 6. The impact of HIV/AIDS on HIV-related health services
(In percent of GDP)

	Palliative care and prevention of opportunistic infections		Clinical treatment		Total HIV-related health services, for assumed rates of coverage		Total health expenditure, 1997	Public health expenditure, 1997
	2000	2010	2000	2010	2000	2010		
Botswana	0.1	0.1	0.2	0.3	0.3	0.4	4.2	2.6
Lesotho	0.1	0.3	0.5	1.0	0.6	1.3	5.6	4.1
Malawi	0.4	0.5	1.5	2.0	1.9	2.5	5.8	3.4
Mozambique	0.3	0.5	1.1	1.8	1.4	2.3	5.8	4.1
Namibia	0.1	0.1	0.4	0.6	0.5	0.8	7.5	3.9
South Africa	0.0	0.1	0.2	0.3	0.2	0.4	7.1	3.3
Swaziland	0.1	0.2	0.4	0.8	0.5	1.0	3.4	2.5
Tanzania	0.3	0.3	1.1	1.1	1.4	1.4	4.8	2.9
Uganda	0.4	0.3	1.4	1.2	1.8	1.5	4.1	1.4
Zambia	0.2	0.2	0.8	0.9	1.0	1.1	5.9	2.3
Zimbabwe	0.2	0.3	0.8	1.1	0.9	1.3	6.2	2.7

Source: IMF staff estimates. The estimates are based on coverage rates of 30 percent for palliative care and prevention of opportunistic diseases, and of 20 percent for clinical treatment.

Table 6 shows that the required expenditure for palliative care, prevention of opportunistic diseases, and clinical treatment is substantial. While some of the countries, notably Botswana and South Africa, would be able to and presumably do achieve higher coverage rates than the ones assumed here, the demand for HIV-related health services accounts for about a third of total health expenditure for two of the poorer countries.

However, many of those who need treatment are not able to pay for it, and would have to rely on public health services. Even at the low coverage rates assumed, the costs of treating HIV patients exceed one half of total public health expenditure for some countries, and exceed total public health expenditure in one case (Uganda). This means that while it would be possible to achieve higher rates of coverage or a higher quality of health services for those who can afford these treatments, access to palliative care, medication to prevent opportunistic diseases, and especially clinical treatment would be very limited for those who rely on public health services.

The Scope for Improving Access to Antiretroviral Therapies

Highly active antiretroviral therapies (HAARTs) are very expensive compared to GDP per capita for the countries of sub-Saharan Africa. Over the last months, a consensus has been built to improve access to HAARTs in developing countries, and to provide the required medications at much reduced costs to governments and other agencies working in Southern Africa. Thus, the costs of HAARTs will fall substantially. Some recent studies estimate that, if HAARTs were priced at marginal costs for the worst affected countries it would be possible to provide these treatments at around \$ 1,000 per patient per year, which compares to costs often exceeding \$ 10,000 in major industrialized countries, or about \$ 5,000 in Brazil, a major producer of generic drugs.¹⁴ The estimates below are based on an estimated total cost of \$ 1,100 per patient per year (including the costs of the drugs, as well as the required medical support) for the lower-income countries, which is somewhat lower than the Worldbank estimates quoted in Table 5, and corresponds to the costs suggested by Members of the Faculty of Harvard University, 2001.¹⁵ For the higher-income countries, the assumed total cost is \$ 1,500. It is important to remember that these are estimates based on pricing of HAARTs at marginal costs, and that these drugs are not yet available at these costs. Still, a cost of \$ 1,100 per year would exceed GDP per capita for 7 of the 11 countries considered here, so that these drugs would not be affordable for a

¹⁴ These numbers refer to the total costs of the treatment, not only to the costs of purchasing the drugs. See, e.g., Bonnel (2001) or Members of the Faculty of Harvard University (2001).

¹⁵ The classification of lower and higher income countries follows Bonnel (2001). See Table 5.

major proportion of the population. Table 7 provides estimates of the costs of providing HAARTs, assuming a coverage rate of 10 percent.¹⁶ Taking into account that the quality of health services in Southern Africa is relatively low, HAARTs are assumed to extend a patients life by only two years, and patients are assumed to receive triple therapy for the last four years of their lives. The projections are based on the database of the International Programs Center at the U.S. Bureau of the Census.

At a coverage rate of 10 percent, the costs of providing triple therapy would initially range from 0.2 percent of GDP for Botswana and South Africa to 2.4 percent of GDP for Malawi. By 2010, the costs will rise to between 0.5 percent of GDP (Botswana, South Africa) to 4.0 percent of GDP (for Malawi), for two reasons. First, as the numbers of AIDS patients will increase in the near future, following the increase in new infection in recent years, the costs will rise to between 0.4 percent and 5.1 percent of GDP. Second, the number of those receiving triple therapy increases, as triple therapy extends the lives of patients.

Table 7 also provides estimates of the total costs of HIV-related services. These numbers are based on the assumption that triple therapy does not change the lifetime costs per patient of other HIV-related costs. While triple therapy reduces the incidence of other HIV-related illnesses of those receiving it, it also extends their lifetime, so that the net effect on the lifetime costs of treatment is not clear.

¹⁶ For Uganda, Binswanger (2000) reports that about 1,000 patients, that is 0.1 percent of those living with HIV/AIDS, receive triple therapy with antiretrovirals. For Malawi, the Washington Post (Nov 1, 2000) reports that the number of patients receiving triple therapy in Malawi is about 30, i.e. 0.004 percent of those living with HIV.

Table 7. The costs of highly active antiretroviral treatments, assuming 10 percent coverage
(In percent of GDP)

	Total HIV-related health services, excluding HAARTs		Costs of HAARTs		Total HIV-related health services, including HAARTs		Total health expenditure, 1997	Public health expenditure, 1997
	2000	2010	2000	2010	2000	2010		
Botswana	0.3	0.4	0.2	0.5	0.5	0.9	4.2	2.6
Lesotho	0.6	1.3	0.7	2.0	1.3	3.2	5.6	4.1
Malawi	1.9	2.5	2.4	4.0	4.3	6.5	5.8	3.4
Mozambique	1.4	2.3	1.7	3.6	3.0	5.9	5.8	4.1
Namibia	0.5	0.8	0.4	0.9	0.9	1.7	7.5	3.9
South Africa	0.2	0.4	0.2	0.5	0.3	0.9	7.1	3.3
Swaziland	0.5	1.0	0.5	1.1	1.0	2.1	3.4	2.5
Tanzania	0.6	0.8	0.7	1.2	1.3	1.9	4.8	2.9
Uganda	0.6	0.6	0.7	0.9	1.3	1.4	4.1	1.4
Zambia	1.0	1.1	1.3	1.7	2.3	2.8	5.9	2.3
Zimbabwe	0.9	1.3	1.1	2.2	2.1	3.5	6.2	2.7

Source: Own estimates.

The estimated costs, based on an assumed coverage rate of 10 percent, show that owing to substantial reductions in the prices of HAARTs, several countries (notably Botswana and South Africa) will be able to provide these medications for a significant proportion of AIDS patients. For example, by 2010, South Africa could achieve a coverage rate for triple therapy of 30 percent at a cost of 1.4 percent of GDP. If the price was \$ 10,000, rather than \$1,500, this cost would amount to 10.9 percent of GDP.

However, for other countries, the scope for introducing HAARTs is very limited. Even for the low coverage rates assumed, HIV-related health expenditure would exceed current public health expenditure for several countries. Thus, it is very doubtful whether the governments of these countries will allocate significant public resources to improve access to HAARTs.¹⁷

While the scope for providing triple therapy through public health services is very limited, many government employees and people working in the formal sector, where wages usually are much higher than average income, could pay for these drugs at a price of \$ 1,100 - \$ 1,500. Thus, even if triple therapies will not be available through the public

¹⁷ A possible exception are temporary treatments to reduce the rate of mother-to-child transmission.

health service, access will increase significantly. Binswanger (2000), for example, reports estimates for Uganda indicating that as the price of antiretrovirals falls from \$ 10,000 to \$600 - \$ 1,200, the number of patients who can afford these treatments increases from about 1,000 to 50,000.

One important limitation for improving private access to antiretrovirals is the lack of a well-developed private insurance sector in most countries. Table 2 shows that private insurance accounts for less than a third of private health expenditure in each of the countries covered here. In particular, policies to expand block insurance of employees through companies, together with a reduction of prices of HAARTs to levels discussed at present, could significantly increase the range of patients receiving triple therapy.

IV. SUMMARY AND CONCLUSIONS

The HIV/AIDS epidemic already is a huge burden on the health sector in the countries of Southern Africa. In most countries, more than one half of all hospital beds are occupied by HIV-positive patients, and the number of AIDS patients per physician exceeds 100. As more people living with HIV are expected to fall ill by 2010, the situation is likely to deteriorate.

The costs of providing health services to HIV patients are substantial. Assuming limited coverage rates of services to HIV patients, the costs of palliative care, prevention of opportunistic infections, and clinical treatment (excluding triple therapy) would amount to between 0.3 and 1.8 percent of GDP in 2000, rising to between 0.4 and 2.5 percent of GDP in 2010. For some of the poorer countries (Malawi and Mozambique), these costs would amount to about 40 percent of total health expenditure.

Reducing the prices of highly active antiretroviral therapies to around \$ 500 per patient per year (and thus the total costs of treatment to \$ 1,100 - \$ 1,500) would greatly increase the numbers of those who can afford to pay for them. This applies in particular to government and formal sector employees, where wages are much higher than average income. However, most of private health expenditure is out-of-pocket, rather than through private health insurance. Expanding the scope of private health insurance and, where this is

not the case currently, including triple therapy in the insurance packages, would further increase the range of those receiving triple therapy.

However, with the possible exception of Botswana and South Africa (and there only to a limited extent), none of the countries in the region will be able to offer general access to highly active antiretroviral therapies through the public health service.

The quality of health services in the region has already deteriorated significantly. To cope with an increasing number of AIDS patients over the next decade, the affected countries need external assistance to build the required health infrastructure and train the required personnel. However, the current costs of providing health services to HIV patients would still account for a very large proportion of total health expenditure for most countries in the region, and attaining just the coverage rates assumed above would be difficult. Moreover, it is important to realize that given the serious shortages in personnel and infrastructure the health sector is facing, the scope for alleviating the impact of HIV/AIDS on the health sector through financial aid is limited.

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