

# The Economic Impact of HIV/AIDS in Botswana

## Executive Summary

Presented by



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to

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### **1. Introduction**

HIV/AIDS continues to be a serious problem in Botswana, with a widespread social, humanitarian and economic impact. HIV prevalence rates remain amongst the highest in the world, although there is some evidence that prevalence rates have peaked, and that some earlier estimates of prevalence were overstated, now that improved nationwide data on HIV prevalence is available.

This study was commissioned by the United Nations Development Programme (UNDP) and the National AIDS Co-ordinating Agency (NACA) to update and refine earlier estimates of the economic impact of HIV/AIDS in Botswana. It had several specific objectives: to analyse the likely macroeconomic impact and make predictions of how that impact would evolve over the period to 2021; to analyse sectoral, household and government budget impacts; and consider policy responses to HIV/AIDS. The study also reviewed the earlier BIDPA (2000) study on the macro-economic impacts of HIV/AIDS, focusing specifically the methodology used in that study and its findings *vis a vis* trends since it was published.

In recent years considerable efforts have been made to contain and reverse the epidemic, with a multi-pronged national response co-ordinated through NACA. Central to this has been the provision of Anti-retroviral Therapy (ART) through the public health system, complementing earlier initiatives to provide ART through private medical aid schemes. There have also been policy initiatives focused on prevention of infection, prevention of mother to child transmission, expansion of counselling and testing facilities, caring for the sick, and support for orphans and vulnerable children. As a result it is considered that by 2006, the majority of those who would clinically benefit from ART were receiving it.

The economic analysis makes use of demographic projections prepared in a parallel study. These indicate that while the spread of HIV appears to have been contained in Botswana, prevalence will be slow to decline, and may even rise further, as a successful ART programme will increase the life expectancy of those who would otherwise have died from AIDS. The number of ART recipients is likely to at least double from current levels (to over 120 000) over the next decade. While ART rollout is considered to have a positive impact from social, humanitarian and economic perspectives, it nevertheless has considerable fiscal implications for government.

### **2. Evaluation of BIDPA (2000) Model and Projections**

The review of the BIDPA (2000) study on the economic impact of HIV/AIDS concludes that that the approaches used in that study were appropriate. The results of the BIDPA study have been frequently referenced by researchers in the field, and both of the main methodologies (the macroeconomic growth model and the household impact model) have been used subsequently by other researchers, who have generally corroborated the BIDPA results.

It is also noted that the assumptions used in the BIDPA models were reasonable at the time, and generally the best that could be made on the basis of the information then available.

Nevertheless, subsequent events indicate that both population growth and productivity growth were underestimated. There have also been developments that were not anticipated at the time of the BIDPA study; most importantly the widespread use of ART, particularly through the public health system, which would have mitigated some of the negative economic impact of HIV/AIDS.

The BIDPA study had predicted that HIV/AIDS would reduce economic growth by up to 2% per annum over the period 1996-2021. While the impact of HIV/AIDS on economic growth is not directly observable (as it compares actual outcomes with a hypothetical counterfactual), it is noted that the growth rate of the non-mining private sector had been declining in recent years, and has more or less grown in line with the BIDPA forecasts, at an average rate of 3.3% between 2000/01 and 2004/05 compared to a forecast rate of 2.9% p.a. While overall real GDP growth has been higher than this, this has largely been due to higher than expected growth in the mining and government sectors.

Overall, it can be concluded that the BIDPA projections were largely consistent with subsequent developments, and that the models used were appropriate. However, the areas of divergence between predicted and actual outcomes, and subsequent analysis of the economic impact of HIV/AIDS in other countries in the region, indicates that more attention should be paid to the model assumptions, and also that a richer understanding can be obtained through the use of Computable General Equilibrium (CGE) modelling. Both of these have been incorporated into the modelling in this study.

### ***3. Economic Projections to 2021***

This study has produced projections of the economic impact of HIV/AIDS through to 2021. The scenarios have also been extended, to incorporate an *AIDS-with-ART* scenario, along with the *No-AIDS* and the *AIDS-without-ART* scenarios previously used. The broad conclusion is that HIV/AIDS is having a substantial negative impact on the economy of Botswana. The detailed projections show that, in the absence of widespread ART provision:

- average real economic (GDP) growth will be reduced by 1.5% to 2.0% a year over the period 2001 - 2021, resulting in the economy being 25% to 35% smaller as a result of HIV/AIDS than it would have been otherwise;
- this negative impact results from reduced labour force growth, a younger labour force, reduced productivity and reduced investment;
- in terms of its effect on GDP, the impact of HIV/AIDS is approaching the impact that would result from the decline and closure of Botswana's mining sector over 15 years<sup>1</sup>;
- population growth is also reduced, from an estimated 2.2% a year without AIDS to 1.1% a year with AIDS (but without ART)
- as the reduction in economic growth is greater than the reduction in population growth, average income growth will also fall, with the estimated growth rate of GDP per capita

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<sup>1</sup> This refers to the impact on GDP only; the impact of HIV/AIDS on the balance of payments and the government budget is significantly smaller than would be the impact of the demise of the mining sector.

falling by 0.5% - 1.0% a year, resulting in average real incomes being 10% to 15% lower after 20 years as a result of HIV/AIDS;

- these conclusions are robust to different simulation methods, with both the macroeconomic model and the CGE model giving similar estimates of the reduction in growth as a result of HIV/AIDS.

However, the widespread provision of ART to HIV positive individuals through the public health system will offset some of the negative economic impact of HIV/AIDS:

- the provision of ART will contribute to raising economic growth, adding a projected 0.4% to 0.8% to average annual growth over the 20 year period; this results from a larger and healthier labour force, and reduced negative impact on productivity, compared to the with-AIDS scenario;
- while the provision of ART will mitigate the negative economic impact of HIV/AIDS, it will not eliminate it, and HIV/AIDS will still have a significant negative economic impact even if ART is widely available; this results in part from the very high costs of widespread ART provision;
- even with this mitigated impact, HIV/AIDS in the with-AIDS scenario will cause economic growth to be reduced by 1.2% a year, compared to a no-AIDS scenario, and the economy to be 23% smaller after 20 years;
- the provision of ART can therefore offset about one quarter to one third of the negative impact of HIV/AIDS;
- growth in average incomes will also be reduced, but will be higher than in the AIDS-without-ART scenario;
- comparing the AIDS-with-ART and no-AIDS scenarios, nearly half of the reduction in GDP growth is due to reduced investment, some 20% is due to reduced TFP growth, and 30% due to reduced labour supply.

Compared with the findings of the BIDPA (2000) study, the projected negative impact of HIV/AIDS is slightly in this study. This is primarily due to a larger negative impact on investment than that assumed by BIDPA. However, the predicted negative impact of HIV/AIDS is smaller than that forecast in the IMF (2001) study of Botswana, which had an even larger investment impact. Another important contrast with the BIDPA (2000) study is that BIDPA envisaged that, under some scenarios at least, GDP per capita could be higher in 2021 with AIDS than without AIDS; this is no longer the case, and GDP per capita is lower in both of the with-AIDS scenarios than without AIDS.

HIV/AIDS also has a significant impact in the labour market, with different processes leading to conflicting trends:

- lower population and labour force growth leads to reduced supply of labour (thus reducing un-/under-employment);
- however, reduced investment and reduced productivity lead to reduced demand for labour (thus increasing un-/under-employment);
- on balance, HIV/AIDS leads to less favourable employment trends, with the impact of reduced labour demand outweighing reduced labour supply, leading to higher un-/under-

employment than in the No-AIDS scenario, although the provision of ART helps to improve the situation somewhat;

- the stronger influence of reduced labour supply than reduced labour demand also causes wages to rise more slowly in the with-AIDS scenario.

The models can be used to indirectly estimate competitiveness, given that they produce simulated paths for both productivity and real wages. The projections indicate that (productivity-adjusted) real unit labour costs are higher under the with-AIDS scenarios than under the no-AIDS scenario. In other words, HIV and AIDS is adversely affecting Botswana's international competitiveness due to lower productivity, which is only partially offset by lower wages, and this is a major determinant of the lower living standards that result under the with-AIDS scenarios. However, the adverse impact on competitiveness is reduced in the with-ART scenario.

At the sectoral level, the sectors that are hardest hit by AIDS are those that are particularly labour intensive, including agriculture, manufacturing and trade (wholesale/retail), due to the impact of slower labour force growth. Agriculture is particularly badly affected due to its reliance on less skilled labour, where HIV prevalence rates are higher. Mining is not so severely affected, partly because mining growth is forecast to slow anyway as diamond production levels off, and also because it is highly capital intensive and investment is assumed to be largely protected in the sector.

#### **4. Impact on Government Budget**

HIV/AIDS will have a substantial impact on the government budget, especially under the current scenario of nationwide provision of free ART. The total cost in 2006 is estimated at P1 billion (at 2004/05 prices), which is equivalent to approximately 6% of government spending. These costs include health care costs relating to in-patients, ambulatory patients and the ART programme, as well as related costs such as home-based care, prevention activities, other HIV/AIDS programmes, care of orphans and vulnerable children, and additional old aged pensions. The cost of ART drugs is the largest single component of overall costs.

It is projected that total costs will increase in real terms by some 60% by 2021, although as the economy will also be growing, the share of government spending will only rise slowly, to 8% in 2011, before falling back to just over 7% by 2021.

In the AIDS-without-ART scenario, the cost to government would be lower, as the high cost of ART treatment (which accounts for up to 40% of total programme costs) would be avoided. However, these savings would be counteracted to a large extent by higher health service costs for in-patient and ambulatory care, and higher social spending on home-based care and orphan care, if policy and capacity allow for estimated increases in spending in these areas. Hence total government spending on HIV/AIDS related costs would be 15%-25% lower over 2006 – 2021. At the same time, GDP growth would be lower (due to a greater HIV/AIDS impact without ART), and general government revenues and spending lower as a result. Hence HIV/AIDS-related costs to government would be only some 2% lower, as a percentage of total spending, in the no-ART scenario.

In order to maintain fiscal balance, the costs of HIV/AIDS spending would have to be met by cutting back spending in other areas, possibly including lower priority areas of HIV/AIDS response. This would require prioritising of expenditures and strict budgetary controls.

Alternatively, if HIV/AIDS-related spending is financed through budget deficits, there will be upward pressure on interest rates and a crowding out of private sector activity. Fully funding HIV/AIDS related spending out of budget deficits is not feasible or sustainable, and hence some tough spending trade-offs will be necessary, and those trade-offs will be more severe if ART is provided.

However, it is important to note that the bulk of HIV/AIDS-related public spending will be required *whether or not ART is provided*; the additional cost of ART provision is relatively small (only 30% of spending would be saved if ART is not provided). Furthermore, part of the additional ART costs are met by donors, so that the impact on the overall government budget is reduced further. In addition, this incremental spending on ART will help to unlock additional GDP. The models used here suggest that the additional spending on ART rising to P360m a year will lead to additional GDP amounting P7.5 billion a year. The incremental government revenues on this additional GDP (net of other costs associated with there being a higher population) will also help to cover a part of the costs of ART.

## **5. Micro-level Impact**

The study modelled the household-level impact HIV/AIDS, through a variety of channels, including the direct impact on household incomes and expenditure, as well as indirect impacts resulting from macroeconomic channels affecting wages and employment. The impact was modelled through superimposing the macroeconomic and CGE model results on actual household income and expenditure data from the 2002/03 HIES, and simulating the impacts over the period to 2021.

The conclusion is that HIV/AIDS will have a negative impact on poverty. Both poverty impact simulations in the study indicate a negative impact of up to 3 percentage points on poverty (i.e., with AIDS, the poverty headcount ratio would be up to 3 percentage points higher than in the absence of AIDS). This negative impact arises because of slower income growth and slower employment growth, and also because part of household expenditure has to be diverted towards HIV/AIDS-related spending. In general, household consumption expenditure rises more slowly than overall GDP, reinforcing the negative poverty impact.

While poverty is expected to decline under all scenarios over the period of the projections, the decline will be slower as a result of HIV/AIDS. However, simulations also show that the negative impact of HIV/AIDS on poverty is reduced by approximately one-third to one-half if ART is provided, and that the provision of welfare support through grants to assist in the upbringing of orphans can also substantially alleviate the negative poverty impacts.

## **6. Firm-level Strategies**

Information on the response by firms to HIV/AIDS was gathered through an indicative survey of some 25 firms across a range of economic sectors, yielding a number of interesting results. The key results were as follows:

- the majority (70%-80%) of firms had experienced a negative impact of HIV/AIDS on output and productivity, due primarily to absenteeism (sick leave) and the disruption associated with higher labour turnover and increased recruitment and training;

- notwithstanding the above, a small majority of firms (56%) reported that HIV/AIDS had had no impact on investment, primarily because other factors were of greater importance in determining investment decisions;
- across sectors, the HIV/AIDS impact was greatest in construction and mining, and least in retail trade and the financial sector;
- firms with high proportions of skilled workers appeared to experience the least negative effect, for two main reasons; first, because HIV prevalence is lower amongst skilled workers, and second, because skilled workers have had access to ART for longer (through private medical aid schemes) than unskilled workers;
- firms have responded in a variety of ways, including multi-skilling, and higher levels of recruitment and staffing; in addition, most firms have in-house HIV/AIDS policies, which include counselling, the encouragement of voluntary testing, and non-discrimination against HIV-positive staff;
- the Botswana results are generally consistent with those from South Africa.

## **7. Policy Options Open to Government**

The BIDPA (2000) study made a number of policy recommendations, including:

- in order to address the increasingly serious shortage of skilled workers that was likely to result from HIV/AIDS, and reduce the uncertainty facing firms with regard to the recruitment of skilled workers, government should make it easier for firms to recruit non-citizen skilled workers from outside of the country, and improve the efficiency of the system for granting work permits etc.;
- Government should introduce policies to support the rising number of orphans and vulnerable children due to HIV/AIDS, to reduce the burden on households and minimise possible costs of delinquency and criminality;
- in order to improve the supply of skilled labour, government should consider methods of sharing training costs with the private sector;
- as growth and employment would be negatively affected, Government should continue to make efforts to reduce unemployment, through investment promotion and diversification policies;
- as HIV/AIDS would have a negative impact on poverty, government should implement the recommendations of the 1996 Poverty Study and prioritise poverty reduction strategies;
- the provision of basic services focused on human capacity development would help to offset the negative poverty impact, specifically policies focused on basic health and nutrition; HIV-related counselling support for the youth; and improving the effectiveness of the anti-AIDS campaign;
- given the negative budget impacts, particular attention would have to be focused on prioritising expenditures and ensuring that the additional burden of HIV/AIDS-related spending did not lead to an unsustainable budget situation.

There has been a mixed record in terms of implementing these recommendations. While the general economic policy framework has been supportive of economic growth and diversification, in many instances the implementation of policies has not been supportive (see, for instance, the conclusions of the 2003 FIAS study on the investment climate and the 2004 BIDPA/World Bank Export Diversification Study). In direct contrast to the recommendation regarding the availability of skilled labour, it has become more difficult to recruit non-citizen skilled workers rather than easier. Whereas the optimal economic response to slower labour force growth resulting from HIV/AIDS is to encourage immigration, the actual response has been the opposite. As a result, the growth rate of the non-mining sector of the economy has been sluggish, and unemployment has continued to increase.

The record on poverty reduction has been mixed. Analysis of the HIES results shows that poverty has continued to decline between 1993/94 and 2002/03, but at a slower rate than in the previous decade. However, more specific welfare-oriented interventions have been more successful. An orphan allowance has been introduced, payable to carers, and there is good reason to believe that this has helped to ameliorate some of the worst potential impacts of HIV/AIDS. There have been interventions focused on the youth and voluntary counselling and testing (Tebelopele).

While an assessment of the effectiveness of anti-AIDS publicity campaigns is beyond the scope of this study, the preliminary evidence of a fall in HIV prevalence rates amongst younger age groups suggests that these campaigns are effective, at least to a certain extent.

At the time of the BIDPA study, ART was extremely expensive, and widespread provision of ART was not a feasible option. Subsequently, however, the prices of ART drugs started to fall, in many instances quite dramatically, making improved provision of ART realistic. The MASA programme has been implemented, and Botswana has the most extensive programme of public provision of ART, relative to population size, of any of the countries severely affected by HIV/AIDS in the region. It also appears that the great majority of those who could clinically benefit from ART are now enrolled in either public or private sector programmes. Preliminary indications are that the ART programmes are effective at reducing ill-health, prolonging life and mitigating some of the negative economic impact of HIV/AIDS.

ART provision is, however, expensive, and has – along with other expenditures associated with HIV/AIDS – contributed to a significant rise in the proportion of the government budget devoted to health care and social expenditure. This has been achieved without contributing to an unsustainable budget position, indicating that a prioritisation of expenditures is taking place, as earlier recommended, and that resources have been obtained by reducing unproductive or low priority expenditure. Nevertheless, increased expenditures on HIV/AIDS-related programmes has caused a reduction of spending in other areas, and the postponement of some development programmes.

In terms of policy levers available to government to mitigate the economic impact of HIV/AIDS, many of those remain the same as recommended by the earlier BIDPA study. While some of these have been implemented, others have not, and the need to assist firms to deal with shortages of skilled labour by facilitating the recruitment of non-citizens remains paramount. Similarly, the need to ensure that poverty issues are addressed through the provision of effective social safety nets and focusing economic policies on employment creation needs remains very important.

There are some additional policy issues, however, that have arisen since the BIDPA study, especially those associated with the provision of ART. These include:

- the provision of ART, along with other HIV/AIDS-related spending, imposes a substantial, but manageable, fiscal burden on Botswana;
- in order to preserve fiscal sustainability, there will continue to be a need for fiscal discipline, for cuts in other areas of government spending and the careful prioritisation of fiscal demands and aspects of HIV/AIDS response; there needs to be particular care in decisions that may reduce key investment rather than consumption aspects of government spending;
- in order to minimise the adverse impact of diversion of spending and cutbacks in other priority areas, government should continue to work closely with donors so as to obtain access to concessional resources that can offset the adverse fiscal impact of HIV/AIDS; making the case to donors should be facilitated by the results of economic projections in this study illustrating that the impact of HIV/AIDS on the Botswana economy is massive – in GDP terms it is akin to decline and closure of the entire minerals sector of the economy over a 15 year period;
- Government should also explore ways of bringing down the costs of ART drugs, which make up the largest component of overall costs, by negotiating better prices with pharmaceutical companies or by exploring the potential for using generic rather than branded drugs; also, it will be critical to ensure that the ART program can avoid the emergence of HIV drug resistance and thus the need for more expensive, newer drugs;
- Government will also need to consider the cost and clinical effectiveness of ART distribution channels, especially given the intention of increasing the number of ART dispensing nodes from just over 30 at present to over 100 by 2009. This should include review of the frequency of tests (viral load and CD4) and consultations, and the extent to which contact with doctors can be substituted with contact with other health system personnel (pharmacists, nurses etc.), especially for patients who are stable on treatment, perhaps by accommodating variations on traditional staffing norms and protocols;
- Government should also consider ways to optimise the mix and models of ART, home-based and inpatient care. Policy decisions in these areas (e.g. earlier ART commencement; HBC capacity) may have a substantial influence on needs and resources for different types of care and associated costs (e.g. hospital inpatient care). In particular government should explore ways to promote the shifting of the in-patient burden from referral hospitals in Gaborone and Francistown to district and primary hospitals where bed capacity seems less fully utilised;
- Government should also work on bringing down the costs of other elements of the HIV/AIDS programme, for instance, by ensuring that the costs of orphan care provision are contained;
- Given that labour supplies will be reduced, especially of skilled labour, it will be important to ensure that workers who are HIV positive are able to remain in their jobs for as long as possible, and are given appropriate protection through labour or other legislation;

- Demographic projections show that HIV prevalence rates will fall only slowly, even with a successful ART rollout, and that the numbers of people receiving ART will remain high for a long period of time. This reinforces the importance of a focus on prevention efforts to reduce the extent of HIV of AIDS as quickly as possible;
- Public sector resource allocation issues go beyond the increased needs of health and related spending. The returns to investment in education and human resource development more generally will be reduced, given reduced productivity and life expectancy. Government therefore needs to consider trade-offs and be aware that, although skilled labour is in short supply, there may be other deserving areas where the allocation of resources could have a larger beneficial impact on economic growth;
- More generally, as the impact of HIV/AIDS on investment has potentially the largest impact on economic growth of all the channels of economic effects, it will be important to redouble efforts to improve the investment climate and ensure that barriers to investment by both domestic and foreign investors are removed.