HIV/AIDS. Current costs of HIV/AIDS largely reflect HIV infections that have occurred in the past, and current policies affect the demand for HIV/AIDS-related services over many years, even decades; because of these two aspects, current spending is not a good indicator of the fiscal burden of HIV/AIDS. This study’s estimate of the evolving fiscal HIV/AIDS burden is based on its quasi-liability, which, under a country’s HIV/AIDS policies, is incurred as a consequence of past and current HIV infections, or equivalently, the costs of providing HIV/AIDS-related services and coping with the impact of HIV/AIDS for all people currently living with HIV/AIDS. Costs incurred by new infections add to this liability, while the liability declines as the anticipated HIV/AIDS services necessitated by past infections are delivered. This analysis yields indicators to assess the fiscal consequences of alternative HIV/AIDS policies (based on the quasi-liability associated with respective policies) and allows an analysis of the fiscal sustainability of HIV/AIDS programs, drawing on tools normally applied to analysis of the sustainability of public debt.

Because this analysis relates the fiscal costs of HIV/AIDS to fiscal capacities or the size of the economy, it is important for the fiscal analysis to capture the consequences of HIV/AIDS on the scale of economic activity. The framework therefore includes a macroeconomic model. Building on a neo-classical growth framework, it tracks the implications of the reduced rate of population growth and of the costs of the impact of and response to HIV/AIDS for GDP and government revenues.

**Country Summaries**

**Botswana**

Botswana is among the countries with the highest level of HIV prevalence in the world. According to UNAIDS (2010b), prevalence among the population aged 15–49 was 24.8 percent, and 320,000 people were living with HIV. As a result of HIV/AIDS, key health indicators have deteriorated catastrophically—life expectancy at birth has declined from 66 years in 1990 to 50 years in 2002, recovering only partially to 54 years by 2008 (World Bank 2010a). In addition, the probability of reaching age 50 has dropped to 55 percent (compared to 88 percent without AIDS) for the 2005–10 period (United Nations Population Division 2009). Because of the decline in life
expectancy, the Botswana Human Development Index ranking slipped from 71 in 1996 to 125 as of 2007 (UNDP 2009).

The scale of the epidemic in Botswana brings extraordinary policy challenges for planning, managing, and financing the response to the epidemic. The objectives of this study are to assess fiscal policy challenges arising from the HIV/AIDS response, develop tools to better understand the links between the HIV/AIDS program and the fiscal costs of HIV/AIDS, and thus inform the planning of the national response and fiscal planning in general. This study complements the ongoing Public Expenditure Review, which focuses on the broader fiscal picture.

Regarding the scale of the HIV/AIDS impact, this study’s estimates and projections suggest that the fiscal costs of HIV/AIDS will rise from Pula (P) 3 billion (2010) to P 5.5 billion by 2030 (figure O.1). Relative to gross domestic product (GDP), the fiscal costs peak at 3.5 percent of GDP around 2016, and slowly decline to 3.3 percent of GDP by 2030. The biggest components of the fiscal costs of HIV/AIDS are care and treatment, increasing from P 1.3 billion (43 percent of total) to P 2.5 billion (46 percent of total), reflecting the increasing number of people receiving treatment, as well as the increasing use of second-line treatment over this period. Mitigation expenses, largely in support of the increasing number of orphans, increase from P 0.8 billion to P 1.5 billion (25 and 28 percent of total costs, respectively), whereas the costs of prevention programs increase from P 0.2 billion in 2010 to P 0.4 billion in 2030 (remaining at 7 percent of total). The HIV/AIDS impact on public servants, excluding treatment and other costs already counted in the other cost categories, amounts to about P 0.3 billion throughout the projection period, and declines from 0.3 percent of GDP in 2010 to 0.2 percent of GDP in 2030. Unlike, for example, in South Africa, social expenditures other than orphan care do not appear to play a large role in the fiscal costs of HIV/AIDS in Botswana.

The 20 years covered by this study’s projections are also a challenging period for public finance in Botswana in general—as discussed in detail in the National Development Plan 10 (NDP 10; Botswana 2010) and the World Bank Public Expenditure Review (World Bank 2010b). Between 2010 and 2014, the economy and fiscal revenues are expected to rebound from the global economic crisis, and this explains why HIV/AIDS spending remains flat relative to GDP over these years while increasing sharply in absolute terms. However, the role of the mineral
sector and the corresponding fiscal revenues are expected to decline over the later years covered by this study. This study therefore projects that government revenues slow down relative to GDP, and the fiscal costs of HIV/AIDS rise from 10.8 percent of government revenues in 2013 to 12.2 percent by 2021.
One of the crucial aspects of the fiscal dimension of HIV/AIDS is the persistence of the costs incurred by the impact of and the response to HIV/AIDS. In this regard, the commitments under the HIV/AIDS program can be considered a quasi-liability that absorbs fiscal space and needs to be paid off over a long period. Overall, the value of this liability (measured by the present discounted value) amounts to 192 percent of GDP, if the costs of projected infections are included, or 94 percent of GDP if only the costs committed for past infections are included. Even taking into account that the HIV/AIDS response in Botswana has been financed partially through external support, and that its fiscal context is relatively benign (though with difficult challenges lying ahead), these estimates indicate that the impacts of and the response to HIV/AIDS represent an extraordinary fiscal challenge.

External support to Botswana’s HIV/AIDS program, on a per capita basis, is among the highest received by any country in the world. This, however, reflects the extraordinarily high costs of HIV/AIDS in the country. When measured against the costs of the HIV/AIDS program, the rate of external support (usually 10–20 percent of total program costs) appears in line with international norms regarding support to HIV/AIDS programs across countries (figure O.2). However, even taking into account the level of external support, the HIV/AIDS cost burden for public
finance remains very high. For example, if donor support continues to account for 20 percent of the fiscal costs of HIV/AIDS, the costs would still be equivalent to 156 percent of GDP, compared to 192 percent without external support.

One of the challenges in assessing the fiscal dimension of HIV/AIDS and HIV/AIDS programs is the extremely long time lag between cause (an infection or a policy action) and effect (for example, demand for treatment or certain social mitigation services), which can span several decades. To inform policy choices, however, the prospect of incremental changes in public expenditures over such a long time period is not a very tangible concept. Instead, HIV/AIDS can be interpreted as a quasi-liability. In this interpretation, an additional HIV infection, under the coverage rates of HIV/AIDS-related services targeted under the HIV/AIDS program, corresponds to a liability equivalent to the present discounted value of the additional spending triggered by the infection. Costs incurred by an additional infection are estimated as equivalent to P 92,000 (measured by the PDV, applying a discount rate of 3 percent), corresponding to about two times GDP per capita, largely reflecting the costs of treatment (figure O.3).

Combining the macroeconomic and microeconomic strands of the analysis, current spending is compared to the costs incurred by new infections. While the former remains well over 3 percent of GDP throughout

**Figure O.3:** Botswana: Costs of One Additional Infection

- **Source:** Authors’ calculations.
the projection period, the latter declines from 2.3 percent of GDP in 2010 to 1.5 percent of GDP by 2030. This reflects that almost all of current HIV/AIDS spending is a result of past infections, while reduced HIV incidence over the last years translates into lower spending commitments. Consequently, the quasi-liability implied by the costs committed under the HIV/AIDS program declines from 94 percent of GDP as of 2010 to 50 percent of GDP as of 2030 (figure O.4).

**Figure O.4:** Botswana: Fiscal Costs of HIV/AIDS, 2010–30

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Source: Authors’ estimates and projections.
South Africa

This study addresses HIV/AIDS as a complex challenge to public policy, with significant fiscal implications as well as impacts on the government’s ability to attain its key policy objectives (notably in the areas of health and social policy). Unlike a costing study of an HIV/AIDS program, this analysis is embedded in a review of the state of public finance and covers a range of fiscal consequences of HIV/AIDS beyond the costs of the policy response, such as payroll-related costs and the impact on social grants. In light of the persistence of the fiscal costs incurred by HIV/AIDS, this study adapted tools initially developed for the analysis of the level of long-term liabilities and the sustainability of public debt to assess the fiscal burden of HIV/AIDS.

According to the Actuarial Society of South Africa (ASSA 2006),
1 HIV prevalence exceeded 1 percent of the population aged 15–49 only in 1993. From that level, it escalated rapidly, reaching 10 percent just five years later (1998), and increased further to just under 17.8 percent by 2009. UNAIDS (2010a, 2010b) estimates that 5.6 million people were living with HIV/AIDS in South Africa at end-2009. Data from antenatal clinics suggest that HIV prevalence has stabilized in recent years (DOH 2009). During 2005–10, crude mortality increased to a level last observed in the early 1960s. Life expectancy (52 years) has fallen back to the level observed in the mid-1960s and currently is 20 years lower than in Brazil, although the level of GDP per capita is about the same in both countries (Figure O.5).

Unlike the impact of HIV/AIDS on key health outcomes, the most comprehensive studies available find that the macroeconomic impact of HIV/AIDS has been moderate so far. Ellis, Laubscher, and Smit (2006), adapting the macroeconomic model maintained by the Bureau for Economic Research at the University of Stellenbosch, estimated that HIV/AIDS reduces GDP growth by 0.4 percent annually through 2020. In addition to aggregate impacts, HIV/AIDS also has distributional implications. For example, HIV prevalence may differ across socioeconomic groups. Moreover, access to health insurance is very limited outside the top three income deciles, and poorer households are less able to self-insure against health shocks.

In 2006/7 and 2007/8, government revenues accounted for about 30 percent of GDP, and the budget returned a surplus (1.2 percent and 1.7 percent...
Figure 0.5: South Africa: Evolution of the HIV Epidemic


b. Percent of the population, 1990–2009


of GDP, respectively). However, the global crisis has caused a deterioration of the fiscal situation and outlook. GDP growth declined from over 5 percent in 2006 and 2007 to 2 percent in 2009, and is expected to recover only slowly. Meanwhile, government revenues have dropped by about 3 percent of GDP, and expenditures have increased by over 5 percent of GDP, so that the fiscal balance deteriorated to –7 percent of GDP by 2009/10. For the financing of the national HIV/AIDS program—as for other categories of public spending—this means that the available fiscal resources are tighter than what was expected two years ago, and will remain so over the coming years. GDP is expected to recover only slowly, and the government expects that by 2012/13 it will have accumulated additional public debt (compared to 2008/9) equivalent to 15 percent of GDP (National Treasury 2010).

The national HIV/AIDS response is guided by the HIV & AIDS and STI Strategic Plan for South Africa, 2007–2011 (SANAC 2007) and organized around the goals of (i) reducing the rate of new HIV infections by 50 percent by 2011 and (ii) reducing the impact of HIV and AIDS on individuals, families, communities, and society by expanding access to appropriate treatment, care, and support to 80 percent of all HIV-positive people and their families by 2011.

In the national budget, HIV/AIDS-related line items appear in the budgets of the Department of Health, the Department of Education, and the Department of Social Development. HIV/AIDS line items increased from R234 million in 2000/2001 to R5.9 billion in 2009/10 (or from US$32 million to US$750 million) and are expected to rise to R9.3 billion by 2012/2013. The bulk of HIV/AIDS-related spending (R5.1 billion, or 86 percent of total HIV/AIDS-related line items in fiscal year 2009/10) is administered through the health budget. The structure of HIV/AIDS-related health expenditures changed over this period, many health services are now administered through provincial budgets. As HIV/AIDS-related health services expanded, an increasing share of HIV/AIDS-related allocations under the Department of Health have been accounted for by specific allocations to provinces (“conditional grants”).

In addition to the costs of the national HIV/AIDS response, an important aspect of the fiscal dimension of HIV/AIDS is the impact on social expenditures. South Africa has established a fairly extensive public social security system, accounting for 12 percent of total government expenditures (3.5 percent of GDP) in 2009/10 (National Treasury 2010). HIV/AIDS affects the incidence of the conditions targeted by social grants, such as
orphanhood or disability, and arguably has contributed to the increase in the number of recipients of foster care grants (from 276,000 in 2000/2001 to 569,000 in 2009/10) and disability grants (from 613,000 in 2000/2001 to 1,423,000 in 2006/7). Conversely, certain categories of social grants (for example, old-age pensions and child support grants) are likely to decline as a result of increased early mortality or reduced fertility due to HIV/AIDS-related illnesses.

This analysis has been conducted in tandem with the ongoing “2031” study of “The Long-Run Costs and Financing of HIV/AIDS in South Africa” (Guthrie and others 2010), builds on the costing developed in this context, and is organized along three scenarios:

- A “narrow NSP” scenario based on the National Strategic Plan 2007–11 that applies 2011 coverage rates for projections (excludes male circumcision and includes antiretroviral treatment with CD4 count eligibility of 200 cells/mm³ with old World Health Organization [WHO] treatment regimen).

- An “expanded NSP” scenario that takes a comprehensive approach including all the NSP goals, using the new WHO treatment regimen and increased CD4 eligibility threshold (350 cells/mm³) attained by 2015, but reallocates funds to prevention measures such as male circumcision, increasing voluntary counseling and testing, condom distribution, reducing violence against women and working with sex workers, and includes poverty alleviation and a scaling-up of certain interventions through 2021.

- A “hard choices” scenario to 2015 that assumes difficult choices between interventions due to constrained resources, with focus on the most cost-effective prevention interventions, treatment interventions remain under the narrow NSP scenario, and reduced social mitigation and orphan support.

Under the narrow NSP scenario (figure O.6), the fiscal costs almost double from R18.4 billion in 2009 to R32.8 billion in 2016, but subsequently decline to R19.1 billion by the end of the projection period. Relative to GDP, the costs peak at over 1 percent of GDP in 2012–16, and decline to about 0.4 percent of GDP by 2031. Under the expanded NSP scenario (figure O.7), the build-up in costs is faster, but costs substantially decline over the last decade of the projection period as a result of more
Figure 0.6: South Africa: Fiscal Costs of HIV/AIDS, "Narrow NSP" Scenario, 2007–31

Source: Guthrie and others (2010), and authors’ calculations.

Figure 0.7: South Africa: Fiscal Costs of HIV/AIDS, "Expanded NSP" Scenario, 2007–31

Sources: Guthrie and others (2010), and authors’ calculations.
aggressive prevention measures early on, and by 2031—at R14.9 billion—are lower than in the narrow NSP scenario.

In some regards, these projections resemble estimates available for other countries—treatment costs are the most important drivers of the fiscal costs over the next decade, and enhanced prevention efforts in the expanded NSP scenario reduce the fiscal costs later on. A unique feature of the fiscal costs of HIV/AIDS in South Africa is the impact of HIV/AIDS on social grants. While HIV/AIDS results in an increase in the incidence of conditions targeted by disability grants and foster care grants, the number of children who could qualify for child support (with some delay) and the number of people reaching age 60 who may qualify for old-age grants declines. While HIV/AIDS increases the costs of social grants initially, the accumulating effect of mortality from HIV/AIDS on the size of the population reaching old age eventually results in a slowdown in the costs of social grants.

One of the factors complicating the assessment of the fiscal costs of HIV/AIDS is that the costs occur over very long periods of time—on the microeconomic level (as infections result in costs over several decades) and on the macroeconomic level (the commitments under an HIV/AIDS program translate into persistent fiscal costs). For one additional infection, the fiscal costs are dominated by increased treatment need over 20 years following an infection, and reduced costs of social (that is, old-age) grants later on. Using a discount rate of 3 percent, the cost of one additional infection total R16,400 (about one-third of GDP per capita) for the narrow NSP, and R20,900 for the expanded NSP (figures O.8 and O.9). The most important aspect of the costs incurred by an infection are the costs of treatment (for example, R31,900 for the expanded NSP). Because few people living with HIV/AIDS reach retirement age, fiscal costs are partially offset by a reduced incidence of old-age grants.

On the macroeconomic level, in light of the persistence of fiscal costs, the study used the present discounted value (PDV)—that is, the amount that would need to be put aside now to cover all future costs discounted by the applicable interest rate—of the projected costs as a summary measure of the fiscal costs of HIV/AIDS. For the narrow NSP, the cost of the HIV/AIDS program comes to 36.6 percent of GDP (or 18.1 percent of GDP including other cost and offsetting items, notably arising from reduced demand for old-age grants). While the “expanded NSP” program is more expensive initially, the overall program costs (37 percent of GDP) are very close to those of the narrow NSP—while the coverage rates of HIV/AIDS-related services
are higher in the expanded NSP scenario, this is offset by savings from increased prevention efforts and reduced HIV infections.

Beyond the costs of the HIV/AIDS program, the decline in the costs of social grants, mainly reflecting a decline in the number of people reaching the age of eligibility for old-age grants, is a significant aspect of the fiscal costs of HIV/AIDS. This decline brings down the overall fiscal costs to
18.1 percent of GDP for the narrow NSP and 16.6 percent of GDP for the expanded NSP. However, these fiscal savings represent a slowdown in what would otherwise be a steep increase in the costs of social grants (reflecting increased life expectancy excluding the impact of HIV/AIDS), and cannot be mobilized for financing the HIV/AIDS response.

An alternative way of assessing the fiscal burden of HIV/AIDS is based on the fact that most of the future HIV/AIDS-related costs are ultimately incurred as a consequence of new infections, whereas current expenditures predominantly serve needs caused by past infections. In terms of adding to the fiscal burden of HIV/AIDS, the costs incurred by new infections, that is, the costs “committed” under the targets of the HIV/AIDS program as a consequence of the new infections, therefore provide a more accurate measure. This study estimated the costs of HIV/AIDS on a “commitment basis” at about 0.5 percent of GDP initially, and declining over the projection period (figures O.10 and O.11). Thus, while expenditures continue to increase over the coming years, the underlying fiscal burden, in terms of the amount that would need to be put aside now to cover the future costs incurred as a consequence of new HIV infections, is declining.

This analysis has implications for the design of HIV/AIDS-related policies in several areas. The analysis shows that the impact of and the response to HIV/AIDS are significant from an overall fiscal perspective, not only because they intersect with many of the government’s key policy objectives, but also because the HIV/AIDS response absorbs significant fiscal resources over a long period of time.

However, in contrast to the large fiscal costs of HIV/AIDS, the availability of data on the costs of HIV/AIDS and related services, the coverage of services, and cost-effectiveness of interventions is limited. Investments in improving evidence on the drivers and course of the epidemic in South Africa and the costs and effectiveness of alternative HIV/AIDS-related interventions are likely to yield high returns—both in terms of improving the effectiveness of the national HIV/AIDS response and for achieving improved health outcomes.

However, in addition to providing a framework for analyzing and projecting the fiscal costs of HIV/AIDS, and thus assisting in planning for financing the national HIV/AIDS response, this analysis provides tools to inform policy choices both on the microeconomic level and for assessing broad alternative HIV/AIDS policies. To enable concrete policy choices on the microeconomic level, this analysis translates the costs incurred by one
Figure O.10: South Africa: Fiscal Costs of HIV/AIDS, “Commitment” Basis, “Narrow NSP” Scenario, 2010–31

![Graph showing fiscal costs of HIV/AIDS in South Africa from 2010 to 2031. The graph illustrates the percentage of GDP for total costs (excluding and including social grants) and prevention and population-based spending.]

Source: Authors’ calculations.

Figure O.11: South Africa: Fiscal Costs of HIV/AIDS, “Commitment” Basis, “Expanded NSP” Scenario, 2010–31

![Graph showing fiscal costs of HIV/AIDS in South Africa from 2010 to 2031. The graph illustrates the percentage of GDP for total costs (excluding and including social grants) and prevention and population-based spending.]

Source: Authors’ calculations.

Note: PMTCT = Prevention of mother-to-child transmissions.
HIV infection over time under an HIV/AIDS program into a cost (a “quasi-liability”) that is incurred at the moment an infection occurs. These estimated costs of an additional infection provide a straightforward tool to assess the (cost) effectiveness of prevention measures.

Alternatively, this analysis can be used to compare the fiscal consequences of alternative HIV/AIDS policies by integrating the fiscal savings from reduced HIV incidence, along with current outlays, into an assessment of the fiscal costs of an HIV/AIDS program. For example, the costs of the HIV/AIDS programs under the expanded NSP scenario and the narrow NSP scenario are approximately the same, because higher outlays early on under the expanded NSP are offset by the fiscal savings from reduced HIV incidence (even without taking into account direct health outcomes, which are clearly superior under the expanded NSP).

Swaziland

Swaziland has the highest estimated HIV prevalence in the world; 26 percent of the working-age population is estimated to be HIV positive (UNAIDS 2010a, 2010b). As a result of HIV/AIDS, crude mortality in Swaziland has risen from 0.9 percent in 1990–95 to 1.6 percent in 2005–10 (United Nations Population Division 2009), and the probability of a newborn reaching age 50 has dropped from around 80 percent to just over 40 percent. The World Bank (2010a) estimates that life expectancy has dropped from 59 years in 1991 to 45 years in 2005. The Swaziland Central Statistical Office (CSO) and Macro International (2008) report that 20 percent of young Swazis aged 10–14 had lost at least one parent, and 7.5 percent had lost both parents.

The pervasiveness of the epidemic in Swaziland poses extraordinary policy challenges in terms of planning, implementing, and financing the response to the epidemic. Moreover, these challenges will persist over many years or even decades—even if HIV incidence is rapidly reduced, the number of people requiring treatment will continue to rise for many years, and a large number of young people will continue to grow up in households affected by illness or death.

Overall, this analysis estimates that the costs of HIV/AIDS and the HIV/AIDS program are 5.5 percent of gross domestic product (GDP) in 2010, and that costs will rise to 7.3 percent of GDP by 2020, slowly declining to 6.6 percent of GDP by 2030 (figures O.12a and O.12b). The most important components of HIV/AIDS costs are: care and treatment,
which are estimated to almost double from 1.5 percent of GDP in 2010 to 2.7 percent of GDP in 2020; mitigation, rising from 1.8 percent of GDP in 2010 to 2.6 percent of GDP by 2020; and the overhead of the HIV/AIDS program, rising from 1.2 percent of GDP in 2010 to 1.4 percent of GDP by 2015.
These costs will be occurring during a period in which government revenues are expected to slow down as a result of declining receipts from the Southern African Customs Union (SACU). Consequently, this study estimates that the projected costs of HIV/AIDS and the HIV/AIDS program will rise from 18 percent of current expenditures and 22 percent of government revenues in 2010 to 31 percent of current expenditures and 23 percent of government revenues by 2020.

Even if current levels of external financing can be maintained, these estimates present an extraordinary fiscal challenge. In the past, Swaziland was able to finance about 60 percent of the cost of its HIV/AIDS program from external sources, a level of support that appears consistent with donor practice across countries (figures O.13a and O.13b). However, just to sustain this share in the face of increasing HIV/AIDS costs, external support would need to rise substantially. Meanwhile, the high level of projected fiscal costs leaves Swaziland highly vulnerable to a slowdown in external support.

Because the fiscal costs of HIV/AIDS are highly persistent, and most represent firm policy commitments, they can be interpreted as a quasi-liability and analyzed using methods similar to debt analysis. The study estimates that the present discounted value (PDV) of fiscal commitments under the HIV/AIDS program and other fiscal costs of HIV/AIDS correspond to 293 percent of GDP, of which fiscal costs equivalent to 151 percent of GDP have already been incurred as a result of HIV infections that have occurred through 2010, and the balance covers the costs of projected future infections.

This analysis on the fiscal costs of HIV/AIDS over time also provides some tools for assessing fiscal trade-offs inherent in HIV/AIDS program choices. Similar to the analysis of the extent to which HIV/AIDS and the HIV/AIDS response absorb fiscal space (using the PDV of the costs of HIV/AIDS), the implications of policy choices or outcomes can also be assessed in terms of changes in the PDV. For example, this analysis estimates that one additional infection absorbs fiscal resources equivalent to almost four times GDP per capita (figure O.14).

Because of the long lags between “cause” (new infections) and “effect” (demand for services and fiscal costs), current spending is not a good indicator for the evolving fiscal burden of HIV/AIDS. To provide a more accurate measure, this study combines the macroeconomic and microeconomic strands of the analysis by comparing current spending with the costs incurred by new infections (figures O.15a and O.15b). While overall
spending (mostly paying off the fiscal costs of past infections) hovers between 6 and 7 percent of GDP for most of the projection period, the costs incurred by new infections decline to 3 percent of GDP by the end of the projection period (in addition to annual costs of about 1 percent of GDP, which cannot be directly attributed to new infections). The quasi-liability of the fiscal costs committed under the HIV/AIDS program as a result of HIV infections declines from 151 percent of GDP in 2010 to 109 percent of GDP by 2030.

Sources: a. OECD (2010); b. Authors’ calculations, based on UNAIDS (2008) and IMF (2010).
In summary, the impacts of and the response to HIV/AIDS present an extraordinary policy challenge for the government of Swaziland. The purpose of this study is to highlight the fiscal dimension of this policy challenge. Specifically, this study spells out the fiscal costs of HIV/AIDS and the HIV/AIDS program, based on and projecting forward from the National Strategic Framework. On this level, the study informs the fiscal planning of the national HIV/AIDS response, and fiscal planning in general.

The fiscal costs of HIV/AIDS, however, are policy dependent; they rely on both the supply and cost-effectiveness of HIV/AIDS-related services, as well as the demand for these services, which also reflects the effectiveness of HIV/AIDS policies. This macroeconomic analysis highlights the stakes in getting the HIV/AIDS response right and ensuring that it is cost-effectively delivered from a specific (fiscal) perspective. Additionally, this analysis provides tools to inform specific policy choices that would also draw on data, for example, on the state of the epidemic, the transmission pattern, and specific interventions, which are beyond the scope of this analysis. In this regard, the study focuses on the link between HIV incidence and the fiscal costs of HIV/AIDS, translating the long-term consequences of an HIV infection into a specific cost that can be used to evaluate HIV policies from a fiscal angle.
Uganda was one of the first countries to face an escalating HIV epidemic. While the level of HIV prevalence in Uganda is much lower now than at its peak, and is currently lower than some other countries in the region, the national HIV/AIDS response poses considerable fiscal challenges.
In particular, even though costs are lower in absolute terms, the cost of treatment relative to GDP per capita is higher in Uganda than in (middle-income) countries with the highest rates of HIV prevalence. As a result, the projected cost of the national HIV/AIDS program, which exceeds 3 percent of GDP for most of the projection period, is large from a macroeconomic or fiscal perspective.

This study aims to further the analysis of the fiscal dimension of HIV/AIDS to inform both medium-term fiscal planning and the planning and management of the national HIV/AIDS response. Specifically, this paper addresses three aspects of the fiscal dimension of HIV/AIDS in Uganda:

• The costs of meeting the demand for HIV/AIDS-related services under the national HIV/AIDS policy, as embodied in the National Strategic Plan (NSP).

• The large role of external support in financing Uganda’s HIV/AIDS program.

• Because of the long duration of commitments under the HIV/AIDS program, and the long time lag between HIV infections and the resulting demand for public services, the fiscal costs of HIV/AIDS can be regarded as a fiscal quasi-liability (similar to pension obligations and other social entitlements), and can be analyzed by adapting tools typically used to assess the level and course of a public debt.

Uganda was one of the first countries to experience the rapid spread of HIV/AIDS. HIV incidence peaked in 1988–1990, with around 200,000 new infections every year. The number of people living with HIV/AIDS grew rapidly and peaked at just over 1 million, corresponding to an adult HIV prevalence rate of 12 percent in the first half of the 1990s. According to the most recent data, there were 1.2 million people living with HIV/AIDS in Uganda at end-2009, of whom 440,000 were male adults, 610,000 were female adults, and 150,000 were children (UNAIDS 2010b). In addition, 120,000 new HIV infections and 64,000 HIV/AIDS-related deaths occurred in 2009 (UNAIDS 2010b). However, because population growth in Uganda is very high, HIV prevalence has been declining even though the absolute number of people living with HIV/AIDS has not, and prevalence is estimated at 6.5 percent of the population aged 15–49 as of 2009 (UNAIDS 2010a, 2010b).
HIV/AIDS has resulted in a steep increase in mortality, especially among young adults (figures O.16a and O.16b). According to estimates by the United Nations Population Division (2009), HIV/AIDS-related mortality peaks for women (in 2000–2005) in the 35–39 age group at 2.9 percent annually (compared to 0.6 percent in a no-AIDS scenario), and subsequently

**Figure O.16: Uganda: Mortality by Sex and Age**

Source: Authors’ calculations, based on United Nations Population Division (2009).
declines until mortality increases again because of advanced age. For men (in 2000–2005), HIV/AIDS-related mortality peaks later, between ages 40 and 49, at about 2.5 percent (compared to 0.9 percent in a no-AIDS scenario). Largely as a result of increased access to antiretroviral treatment, the United Nations Population Division (2009) estimates that excess mortality (the difference between the baseline and the no-AIDS scenario) for ages 25–49 decreased from 1.4 percent to 0.9 percent for women, and from 1.0 percent to 0.5 percent for men. Similarly, life expectancy increased from 48.1 years in 2000–2005 (which compares to 57.2 years without AIDS) to 52.4 years between and 2005–10.

In this paper, the estimates of the fiscal dimension of HIV/AIDS are organized around the NSP for HIV/AIDS, covering the period 2007/8–2011/12 (UAC 2007). The model combines an epidemiological module used to project the number of people living with HIV/AIDS, those needing treatment, and other factors determining the demand for HIV/AIDS-related services. This provides projections regarding coverage rates, unit costs of HIV/AIDS-related services, and other costs of HIV/AIDS as well as a macroeconomic model. According to projections (figure O.17), the fiscal costs increase from 2.6 percent of GDP in 2008 to 3.4 percent of GDP in 2015–17. After 2017, the total costs are expected to decrease gradually relative to GDP and reach around 2.9 percent of GDP by the end of

**Figure O.17:** Uganda: Projected Costs of HIV/AIDS Program, 2008–25

![Graph showing projected costs of HIV/AIDS program in Uganda](source: Authors' calculations.

Note: ART = antiretroviral therapy.)
the projection period. Uganda is a fast-growing country, and the relatively stable costs of HIV/AIDS relative to GDP mask a steep increase in absolute terms, from $0.35 billion in 2008 to $1.4 billion by 2025.

In recent years, external financing has contributed about 85 percent of total spending on HIV/AIDS, and the current NSP projects that this level of external financing will remain for the near future. However, the steep increase in the projected costs in absolute terms means that donor allocations to Uganda’s HIV/AIDS program would need to increase relative to donor GDP to maintain a constant share of external financing. To assess the role of external financing and the exposure of domestic finance to a slowdown in donor financing, a scenario in which current rates of external financing remain fixed at 85 percent of the total costs is compared to a scenario in which external financing is constrained by donor countries’ GDP and fiscal resources and grows at a rate of 2.5 percent annually (about the rate of growth of the G-7 economies).

However, fiscal resources are much lower than in Botswana, not only in absolute terms, but also relative to GDP (domestic revenues in 2009/10 were projected at 15 percent of GDP in Uganda, and 33 percent of GDP in Botswana). Consequently, Uganda relies heavily on external support to finance its HIV/AIDS program. To illustrate the vulnerability of domestic finance to a slowdown in external support, this analysis provides two simple scenarios. If external financing remains at 85 percent of the total costs, HIV/AIDS-related financing would have to rise substantially in nominal terms, from about $370 million in 2008 to $800 million by 2015 (in constant 2008 prices, figure O.18a). Alternatively, if aid allocations are constrained to not grow faster than the GDP of main donor countries, domestic financing needs will increase sharply, rising to 2 percent of GDP by 2020, equivalent to 12.5 percent of total government revenues, and remain at about that level through 2025.

In this case, domestic financing of the HIV/AIDS program would rise to 0.5 percent of GDP by 2015, absorbing up to 3.5 percent of government revenues. Alternatively, if aid allocations are constrained to not grow faster than the GDP of main donor countries, domestic financing needs will increase significantly, rising to 2 percent of GDP by 2020, equivalent to 12.5 percent of total government revenues, and remain at about that level through 2025 (figure O.18b).

Due to the long duration of fiscal commitments under the HIV/AIDS response, current spending on HIV/AIDS gives an incomplete or even
misleading picture of its fiscal implications. In other words, current spending responds to a demand for public services for HIV infections that occurred in the past. Therefore, an assessment of HIV/AIDS fiscal implications needs to account for the number of new HIV infections because it is the new HIV infections that determine the demand for public services in the future.
This means that the fiscal commitments of HIV/AIDS share many of the characteristics of a liability. Under the targets and standards specified in national HIV/AIDS policy, an HIV/AIDS infection results in a commitment for future government spending to provide certain services, which translates into future spending commitments. Therefore, HIV/AIDS can be described as a “quasi-liability,” not a debt *de jure*, but a political and fiscal commitment that binds fiscal resources in the future and cannot easily be changed, similar to a pension obligation or certain social grants or services.

Using a discount rate of 5 percent, the value of the quasi-liability implied by the fiscal costs of HIV/AIDS comes out to 212 percent of GDP ($36 billion) as of 2010. About half of these costs (equivalent to 111 percent of GDP) are the result of infections that have already occurred (thus contingent on the parameters of the national HIV/AIDS program). The balance (equivalent to 101 percent of GDP) reflects the costs of projected future infections, and therefore not only depends on targeted coverage rates of HIV/AIDS-related services, but also on the success of the HIV/AIDS program to contain the number of new infections.

Similarly, the policy targets under the NSP and assumed in the projections here can be used to calculate the expected costs incurred by a single infection. Estimates suggest that the expected annual costs associated with an additional HIV infection occurring in 2010 rise to about $450 by 2025, and decline subsequently as a decreasing survival probability results in lower expected costs of treatment. The present discounted value of an additional infection, based on a discount rate of 5 percent, amounts to $5,900, corresponding to about 12 times GDP per capita (as of 2008, figure O.19).

Using the estimate of the quasi-liability incurred by one new infection, one can calculate the quasi-liabilities incurred by new infections over time. The quasi-liability incurred by new infections declines steadily, from about 3.1 percent of GDP in 2010 to 2.1 percent of GDP in 2030. The value of the spending commitments incurred by new infections overall declines from 111 percent of GDP in 2010 to 75 percent of GDP in 2030 (figure O.20). Of the annual decline of about 1.5 percent of GDP, about 1 percent of GDP can be attributed to the fact that the value of new spending commitments is lower than previous spending. The balance, about 0.5 percent of GDP, reflects the fact that Uganda’s economy is growing fast, and contributes to the decline in the value of the liability relative to GDP.
Figure O.19: Uganda: Actual Spending and Costs Incurred by New HIV Infections, 2010–30

Source: Authors’ calculations.

Figure O.20: Uganda: Change in Value of Spending Commitments, 2010–30

Source: Authors’ estimates and projections.