

**THE LONG RUN**  
**COSTS AND**  
**FINANCING**  
**OF HIV/AIDS IN SOUTH AFRICA**

*Prepared by the*

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**aids2031<sup>®</sup>**



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## ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal clinic
ART	Antiretroviral Therapy
ARV	Antiretroviral
ARVs	Antiretroviral drugs
ASSA	Actuarial Society of South Africa
CBO	Community-based organisation
CEA	Cost-effectiveness analysis
CG	Conditional grant
CHBC	Community and Home Based Care
CI	Confidence interval
CSG	Child Support Grant
CSI	Corporate Social Investment
CSW	Commercial sex workers
DBS	Direct Budget Support
DG	Disability Grant
DHS	Demographic and Health Survey
DOE	Department of Education
DOH	Department of Health
DPSA	Department of Public Service and Administration
DSD	Department of Social Development
ENE	Estimates of National Expenditure

ES	Equitable Share
FCG	Foster Care Grant
GDP	Gross domestic product
GFATM	Global Fund for AIDS, Tuberculosis and Malaria
HBC	Home-based care
HDI	Human Development Index
HDR	Human Development Report
HIV	Human Immunodeficiency Virus
HPI	Human Poverty Index
HSRC	Human Sciences Research Council
HTC	HIV Testing and Counselling
IDU	Intravenous drug user
IEC	Information, Education and Communication
IMF	International Monetary Fund
M&E	Monitoring and Evaluation
MARP	Most-at-risk populations
MDGs	Millennium Development Goals
MOT	Modes of Transmission
MSM	Men who have sex with men
MTCT	Mother-to-child transmission
MTEF	Medium-Term Expenditure Framework
NASA	National AIDS Spending Assessment
NDOH	National Department of Health
NGO	Nongovernmental organisation
NHA	National Health Account
NT	National Treasury
OECD	Organisation for Economic Co-operation and Development
OIs	Opportunistic Infections
OOPE	Out-of-Pocket Expenditure
OVCs	Orphans and vulnerable children
PEPFAR	Presidential Emergency Plan for AIDS Relief
PLWHAs	People Living With HIV and AIDS
PMTCT	Prevention of mother-to-child transmission
PPP	Public-private partnerships
RNM	Resource Needs Model
SANAC	South African National AIDS Council
StatsSA (or SSA)	Statistics South Africa
STIs	Sexually transmitted infections
TAC	Treatment Action Campaign
UNAIDS	Joint United Nations Programme on AIDS
UNDP	United Nations Development Plan
UNGASS	United Nations General Assembly on HIV/AIDS
USAID	United States Agency for International Development
US\$	United States Dollars
VCT	Voluntary Counselling and Testing
WC	Western Cape
WHO	World Health Organisation
ZAR	South African rand (local currency)

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## ▪ EXECUTIVE SUMMARY

### **Rationale and importance of the study**

South Africa is facing a major and mounting financial challenge as it strives to respond to the HIV/AIDS epidemic in the country. South Africa has 5.7 million people currently infected with the HIV virus, the largest number in the world, and half a million adults and children are becoming newly infected each year (UNAIDS, 2009). The funding needed to respond to HIV/AIDS on three critical fronts—for prevention, treatment, and care of orphans and others affected by AIDS—is continuing to escalate rapidly, especially as hundreds of thousands of additional South Africans enter antiretroviral treatment (ART) programmes. This situation poses huge financial dangers and risks for the country, particularly at a time when South Africa is feeling the negative effects of the global economic recession and is struggling to maintain its government budget for a wide range of pressing needs including education, housing, job creation, and other health priorities beyond HIV/AIDS.

On the financial front, there are some positive signs. The South African government has progressively allocated new resources to fund the response to HIV/AIDS in the 2009/10–2011/12 medium term period through conditional grants and equitable share allocations, and has sourced an additional R900 million from PEPFAR for the AIDS treatment programme, to cover a budget shortfall expected in 2009/10. Nevertheless, the short-term situation remains difficult and the longer term financial outlook for the national HIV/AIDS response is uncertain.

Under these circumstances, it is critical for the government and for all national and international organizations involved in the fight against AIDS in South Africa to confront a series of key questions about the cost implications and financing challenges facing the country as it struggles to stop the epidemic. How much money will be needed for a strong and effective national HIV/AIDS programme? What can be done to contain AIDS spending? How can financial resources be used more efficiently—are there neglected areas that should be expanded with more funds, and others where spending can be cut back or money can be used better? And who will pay for these vital HIV/AIDS activities in the future? How much can and should the government do, and what about the business sector, NGOs, and South Africa's external partners?

In an attempt to answer these questions, we carried out the aids2031-South Africa project during 2009–2010, sponsored and guided by a national Steering Committee composed of senior South African officials and other leading national figures. The following report describes how we approached these AIDS cost and financing issues, what we learned, and what our findings mean for improved government policies and actions.

### **Aim and objectives of the study**

The aids2031-South Africa project aimed to estimate the influence of several factors on the magnitude, nature, costs, and impacts of the national response to HIV/AIDS in South Africa.

These factors included the level of political will, resources available, rate of behavioural change, as well as the implementation capacity within the country.

The objectives of the South Africa study were to:

- Undertake a review of the available literature on unit costs for HIV/AIDS interventions in South Africa, and to develop a database of these for use in the costing;
- Estimate the medium and long-term costs of the national response to AIDS under a series of scenarios, as well as their projected epidemiological impact (e.g., new and total infections, number of AIDS-related deaths, numbers of persons needing and on treatment);
- Examine options for improved efficiency in resource allocation utilising a priority-setting tool; and
- Prepare a report that consolidates the findings of the resource needs and prioritization in resource allocation.

## Methodology

The project applied five methodological approaches:

- Extensive review of available South African unit costs, which resulted in a database for easy access for future HIV/AIDS cost estimation, budgeting, etc.;
- National costing using the Resource Needs Model (RNM), adapted to South African assumptions as expressed by the Steering Committee and to local data on unit costs and coverage rates;
- ART costs were estimated by Meyer-Rath *et al* (2009) for the NDOH and these were applied to all three scenarios;
- Epidemiological modelling using Spectrum, calibrated to the South African ASSA estimates;
- Effectiveness analysis using the GOALS model, which was combined with Spectrum to allow the selected interventions to influence the epidemiological outcomes, based on the Impact Matrix derived from the data gathered during three rounds of systematic literature reviews of over 200 studies that evaluated HIV prevention interventions in developing countries and the impact of these programmes on behaviour change (Bollinger, 2008).

This process proved to be labour intensive but has produced some important findings, bearing in mind the large uncertainties that exist with any projections over such a long period. We believe that the scenarios chosen cover a range of plausible futures for the South African response to HIV/AIDS over the next two decades, including some more optimistic and pessimistic possibilities. Other scenarios could also be investigated. We did not choose to model the effects of a breakthrough HIV prevention technology such as a vaccine, a treatment leading to a cure, or an effort to test and immediately treat all infected South Africans, because of the doubts and uncertainties connected with these breakthroughs at the present time. The modelling tools we

created could be used to explore the costs and epidemiological impacts of such revolutionary technical changes.

### **Scenarios**

The scenarios discussed and endorsed by the national Steering Committee provide three possible pictures of future AIDS programme scale up for South Africa, which in turn generate epidemiological and resource requirement (cost) results, based on assumed coverage rates and unit costs.

The three scenarios selected represent a range of policy choices: a minimum package (Hard Choices); a middle package (Narrow NSP (i.e., the current national plan)); and a maximum package (Expanded NSP).

#### *Scenario 1: Narrow NSP Interventions to 2011*

This scenario reflects the current South African interventions reaching the NSP targets by 2011, and excludes male circumcision. It includes ART with the CD4 count eligibility of 200 cells/mm<sup>3</sup> with the old WHO-recommended treatment regimen, as was being provided in 2009.

#### *Scenario 2: Expanded NSP to 2021*

This scenario takes a comprehensive approach including all the NSP goals and more, such as male circumcision, reducing violence against women, empowering commercial sex workers, and some poverty alleviating interventions. The scenario assumes achievement of the targets by 2021, except for the new ARV targets which are reached by 2015/16, according to the new WHO treatment regimen and the increased CD4 eligibility threshold (350 cells/mm<sup>3</sup>) adopted by the government in December 2009. It also includes increased VCT and condom distribution, and therefore this scenario best reflects the government's recent launch of its HIV counselling and testing (HTC) campaign.

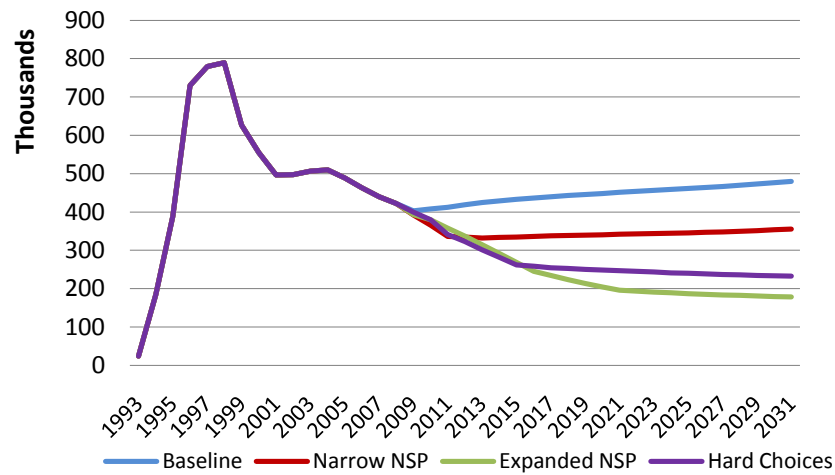
#### *Scenario 3: Hard Choices to 2015*

This scenario assumes that difficult choices have to be made between interventions due to highly constrained resources, and there is a focus on the most cost-effective prevention interventions, including extensive and fairly rapid scale up of male circumcision. The treatment interventions remain the same as for Narrow NSP scenario. The social mitigation and orphans and vulnerable children (OVC) interventions are substantially curtailed in this scenario.

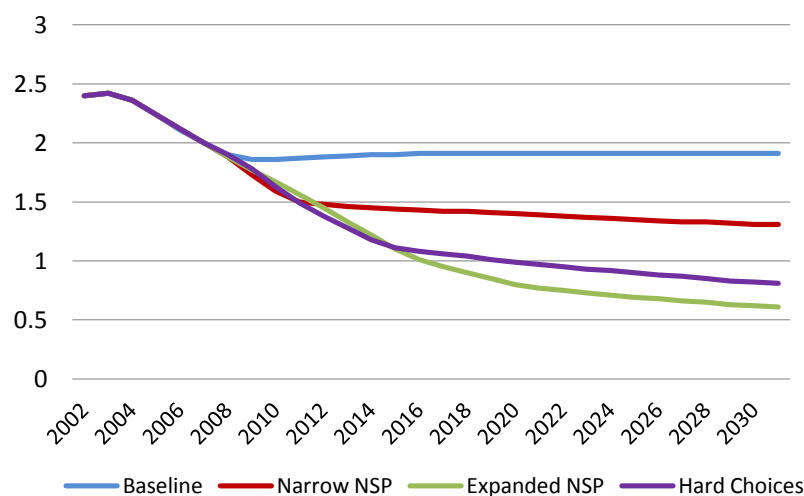
### **Epidemiological Impact**

The epidemiological projections from aids2031 reinforce the view that the HIV/AIDS epidemic is deeply entrenched in South Africa, having already reached levels that make a complete reversal extremely difficult, if not impossible, in the coming years. This is a result of the widespread infections that have already occurred in South Africa over the past decade, which will inevitably require large scale treatment costs in the future. Nevertheless, important achievements can be made in reducing new infections and the HIV incidence rate.



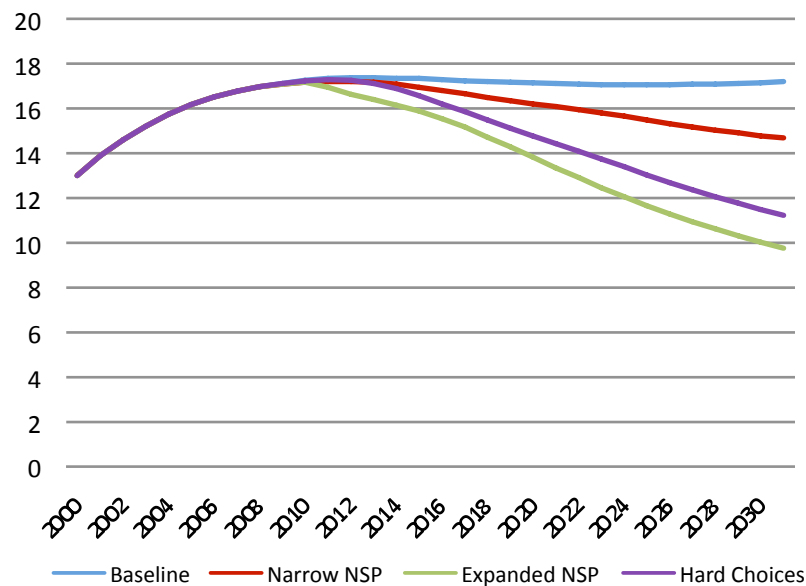
**FIGURE A: Projected New Adult (15–49 yrs) HIV infections, 1993–2031**

In the absence of a “game-changing” new technology such as a vaccine to prevent HIV transmission or a drug that completely eliminates the virus from the body, large numbers of new HIV infections will continue to occur in South Africa in the near and probably medium term future. Even under the most optimistic of the modelled scenarios, the Expanded NSP package, about 5 million more South Africans will become HIV infected over the next two decades—roughly the number who are currently living with the virus. Still, new infections under this approach would be reduced to 200,000 by 2020, and would continue to decrease—thus achieving the NSP goal of cutting incidence by more than 50%—and would succeed in preventing a total of 6 million infections by 2031, as compared to the baseline. Adult HIV incidence would decrease as shown in the following graph, with a reduction of almost three-quarters under the Expanded NSP scenario. Adult (15–49 years) HIV prevalence would also fall from its current 17% to around 10% under the Expanded scenario.

**FIGURE B: Projected Adult (15–49 yrs) HIV Incidence, 2002–2031**

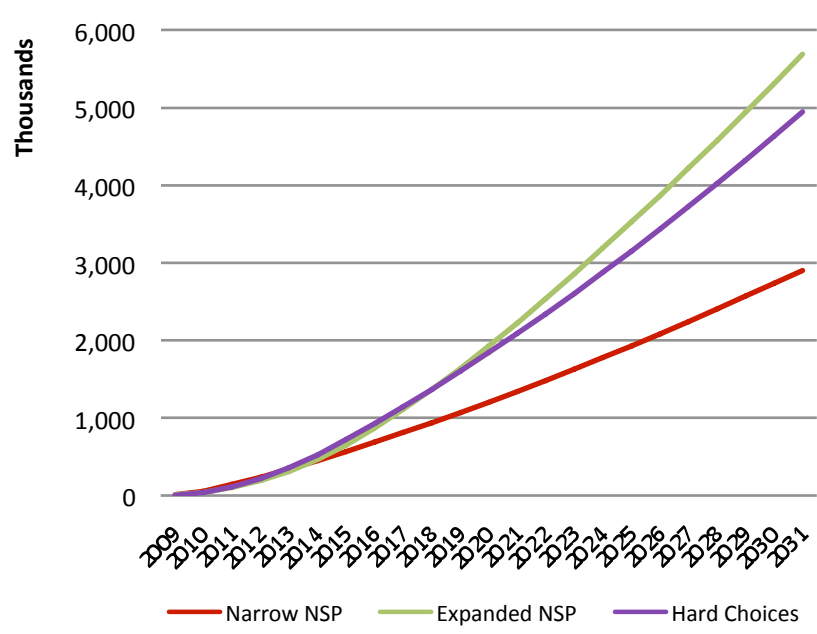


**FIGURE C: Projected Adult (15+ yrs) HIV Prevalence, 2000–2031**



With the Narrow NSP and Hard Choices scenarios, the prevalence rate is projected to decline to around 15% and 11% respectively by 2031. Another 7.5 million South Africans would become infected over the 20 year period under the Narrow NSP, which would fail to reach the NSP goal of a 50% reduction in annual infections. The same is true for the Hard Choices, even though it would do somewhat better than Narrow NSP in prevention, averting approximately two million more infections than the Narrow NSP over the two decades (and at a lower cost).

**FIGURE D: Cumulative Infections Averted (as compared to the baseline), 2009–2031**

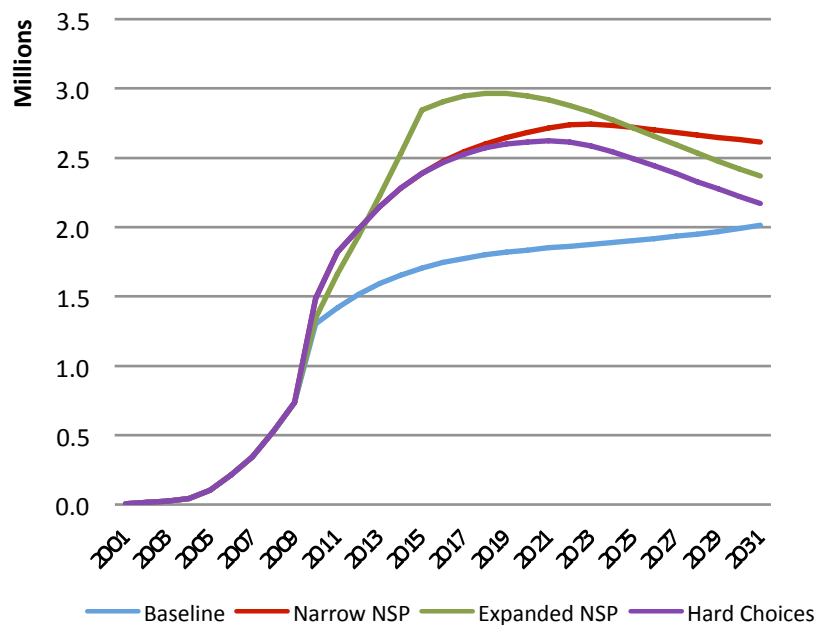


In all scenarios, the commitment to expanding PMTCT and paediatric ART would successfully avert around 15,000 infant HIV-related deaths per year or 300,000 infant deaths over the two decades, assuming that the ambitious NSP targets are achieved by 2011. Since the PMTCT and paediatric ART approaches are already well established in South Africa, the challenge for the country will be to ensure adequate political commitment and increased health system capacity to expand PMTCT services rapidly in the next 18 months to reach 95% of all pregnant women.

In order to cut the number of new HIV infections further, there needs to be massive focus on a major behavioural revolution to stop new infections in “low risk” heterosexual adults. This can only happen if adults have fewer concurrent partners and use condoms regularly.

The numbers of adults receiving ART increases under all scenarios, and particularly the Expanded NSP which incorporates the new CD4 eligibility criteria of  $350 \text{ cells}/\mu\text{m}^3$ .

**FIGURE E: Projected Number of Adults (15–49 yrs) Receiving ART, 2001–2031**



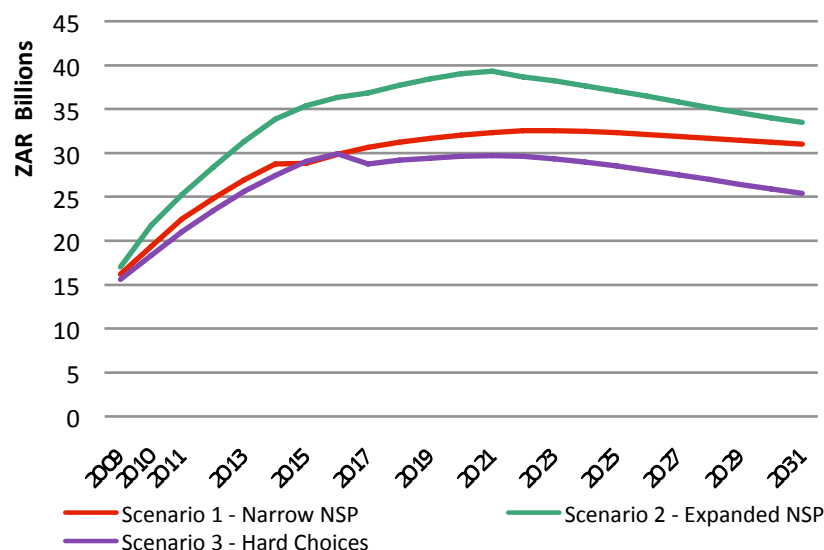
### Estimated costs of each scenario

Each scenario was costed using the Resource Needs Model, by multiplying the population in need of each intervention by the target coverage rate and the unit cost for each intervention. These estimated unit costs and current coverage rates were applied based on the most up-to-date, available South African data. Cost estimates refer to the entire response in South Africa by all actors including the NGOs, businesses and development partners, and do not imply that the responsibility for funding these costs lies exclusively with the public sector.

Under all three scenarios, costs rise very rapidly over the next few years, growing from around R16 billion (US\$2.1 billion) in 2009 to R28–35 billion (US\$3.8–4.7 billion) by 2015/16. This two-fold increase in required resources will put considerable pressure on the government and the South

African economy. The programme cuts under Hard Choices save some funds during this period, as does the slower build up of services under the Expanded NSP scenario, but these savings are small. This is because the majority of costs (59-74%) come from AIDS treatment efforts, primarily the ART component, and this high share of spending for treatment is almost the same under all three scenarios. In addition, the areas that were reduced under Hard Choices in both prevention and mitigation do not account for a large share of costs, so their financial impact is relatively minor compared with the Narrow NSP scenario.

**FIGURE F: Total HIV/AIDS Resources Required by Scenario, 2009–2031 (ZAR billions)**



After 2015, the Expanded NSP rises to about R39 billion (US\$5.2 billion) in 2021 as a result of wider treatment coverage and investments in programmes to reduce vulnerability and address the social consequences of AIDS for orphans and affected communities. Thereafter the Expanded NSP costs gradually decline, as the effects of the prevention interventions are seen in declining numbers of persons requiring treatment. Total costs over the two decades are estimated at R658 billion (US\$88 billion) for the Narrow NSP, R598 billion (US\$79 billion) for Hard Choices, and R765 billion (US\$102 billion) for the Expanded NSP. Importantly, these amounts could be reduced if South Africa obtains lower ARV prices in the new tender being currently negotiated by the national department of health.

In other words, there are several courses that the government can follow in the coming years that appear to be better than the one implied by the current national strategic plan. While the current NSP has some impact on the epidemic, the approaches suggested by the other two scenarios offer better alternatives. If considerably greater political will and financial resources can be mobilised and the South African society can be motivated to adopt important social and behavioural changes, as described by the Expanded NSP scenario, a powerful change in the epidemic could occur, with lower rates of infection and mortality. If the financial resources for HIV/AIDS are

highly constrained and political backing remains strong but more moderate than under the Expanded NSP scenario, then the more targeted approach under the Hard Choices is still an attractive alternative to the status quo, as it could lower the number of infections more than under Narrow NSP and do so at a lower cost. However, the Hard Choices scenario is not estimated to bring the number of new infections down far enough to achieve the 50% reduction envisioned under the NSP, as the Expanded NSP scenario might.

### **Policy options**

Based on the analysis presented in this report, some key emerging policy options that should be considered include the following:

#### **Current HIV prevention efforts must be stepped up**

As the modelling in this project shows, stronger prevention now and over the next few years will lead to fewer HIV infections and lower spending on ART in the future. Such stepped up prevention needs to proceed along several lines, including widespread implementation of prevention tools that have been rigorously proven to be effective, including male circumcision, prevention of mother-to-child transmission, and condom promotion. The government's recent launch (April 2010) of its counselling and testing campaign, and its pending male circumcision policy will be important contributions to such an effort. In rolling out the male circumcision programme, extensive awareness about its partial degree of efficacy must be raised to ensure that women are not made even more powerless in demanding the use of condoms. The costs and benefits of school-based education and mass media programmes need to be more carefully studied, to determine their cost-effectiveness.

In addition, there is need for a social "movement" championed by South Africa's leaders, to promote large-scale behaviour change to reduce the number of multiple and concurrent sexual partners in the general population and increase the use of condoms where such partnerships continue. As this project shows, currently-employed prevention approaches will not stop new infections among low and medium risk individuals, and this is where the great majority of projected new infections will occur in the future under the scenarios we modelled. Something new and innovative must be done to strengthen prevention among the general heterosexual adult population of the country.

Investments in deeper social change programmes (for example, to reduce violence against women, empowerment and legalisation of commercial sex workers, and the improvement of living conditions of people in informal settlements) will take time to implement, but over the longer term these can help to mitigate or eliminate the underlying conditions that lead to vulnerability and risk-taking, thus resulting in greater reductions in new HIV infections.

### **South Africa needs to carefully manage its spending and expansion of ART**

Under all the scenarios we considered, AIDS treatment will expand rapidly over the next 5–7 years, with the numbers of ART patients increasing from a million today to 2–3 million over the coming decade. Investment in personnel and infrastructure will be required to meet this increased need for treatment services, with attention to the adequate salaries and capacity building of professionals, including budgeting and financial management skills for programme managers.

At the same time, since treatment accounts for about two-thirds of current HIV/AIDS spending in South Africa and will absorb an even greater share in the future scenarios modelled, opportunities to reduce the average cost of treating an AIDS patient must be vigorously pursued, so that low cost, high quality ART models can be put in place throughout the country. Efficiencies are possible in many areas, including procurement of generic combinations, rolling out nurse-initiated treatment, and using step-down and community-based approaches that utilise less costly nurses and other auxiliary workers. In addition, continuing attention to the other components of treatment, such as palliative care, home-based care, OI treatment (including TB and MDR TB treatment), and nutritional support are crucial, and should not be forgotten with the increasing ART spending.

### **The government must address the impending HIV/AIDS financing gap**

The analysis carried out for this report points to the large financing demands on South Africa over the next few years as the costs of the HIV/AIDS programme grow twofold from around R16 billion a year to R28–35 billion annually. This will require a strong and effective financial mobilisation strategy by the government. Domestic public financing will need to increase, but the scope for doing so may be limited in the short run because of the effects of the global recession on the South African economy. National health insurance might be a source of expanded public funding, and this should be explored as proposals for insurance are reviewed in the coming period.

In addition, external support from sources including PEPFAR, the Global Fund, and others will be needed to fill the gaps in domestic funding. Development partners need to align with national priorities and commit more predictable financing, over longer periods. The business sector in South Africa could also increase their Corporate Social Investment (CSI) commitments for HIV/AIDS, as well as taking a more proactive role in the provision of ART and other treatment services for their employees and families.

### **There is need for stronger HIV/AIDS cost analysis and monitoring**

As this study has shown, despite the large financial outlays for HIV/AIDS that are occurring in South Africa, there is a paucity of reliable, up to date information on AIDS costs, service coverage levels, and cost-effectiveness in the country. There is need for facility- and project-based cost estimates of many of the interventions in South Africa, where unit costs are still unavailable, incomplete, or unreliable. An updated unit cost database should be maintained and be easily

available, particularly for the public departments to assist with their budgeting processes. Cost-effectiveness studies of the various prevention interventions are urgently needed to inform key policy decisions, so that the most cost-effective approaches can be pursued on a scaled up basis. The current levels of coverage for nearly all prevention and treatment services need to be determined with greater precision, so that the government can know better how well it is progressing toward its targets, and so that the remaining shortfalls and their costs can be accurately determined.

The costing tool used in this project should be maintained and used by the government and other national stakeholders as part of an ongoing effort to assess the financial challenges facing the country as it continues its battle against HIV/AIDS. The tool could also be applied to provincial level programmes and could assist with their budgeting and resource mobilisation efforts. When combined with an analysis of actual HIV/AIDS spending (which will hopefully get under way in South Africa soon), the *aids2031*-South Africa tools could provide a more accurate estimate of the resource gap, which will assist all partners in mobilising and managing their funding on a longer-term basis. The national M&E database needs to include financial indicators which link the inputs with the outputs, and should cover the spending of all actors working in HIV/AIDS in South Africa from the public and private sectors.

### **Final thoughts**

The South African government has stated its commitment to do more to lower the rate of infections, expand treatment, and put in place programmes to cushion the blow of AIDS on individuals, families, and communities. Success will require having informed and vigorous policies on AIDS financing—how much to spend, where and how to spend it efficiently, and how to mobilise the needed funding in a sustained manner.

This report attempts to offer some insights on these financing issues. It suggests that the rise in spending on HIV/AIDS over the next few years will be steep, and even with vigorous efforts, it will be extremely challenging for the country to lower the rate of new infections to achieve the NSP target (50% reduction). The government will also face a financing shortfall that will be hard to fill.

Despite this daunting situation, the report also shows that there is cause for hope and optimism. South Africa has many potential assets at its disposal in tackling the HIV/AIDS financing challenges, if it chooses to deploy them. These assets include its political leaders, its large economy with important growth prospects, and its vibrant civil society and business sectors. South Africa also has a number of international partners who have expressed their willingness to assist the country's efforts through a period of financial stringency and gaps in domestic funding for the national HIV/AIDS programme.

This year and the next one are a critical time for South Africa in setting its HIV/AIDS policies. Informed policy decisions and concerted actions from all partners—government, development partners, business sector and civil society—can have a dramatic effect on the epidemic, its financial costs to South Africa, and the consequences for the health and well being of its people.

## 1. INTRODUCTION

South Africa is facing a major, and mounting, financial challenge as it strives to respond to the HIV/AIDS epidemic in the country. South Africa has 5.7 million people currently infected with the HIV virus, the largest number in the world, and half a million adults and children are becoming newly infected each year (UNAIDS, 2009). The funds needed by South Africa to respond to HIV/AIDS on three critical fronts—for prevention, treatment, and care of orphans and others affected by AIDS—are continuing to escalate rapidly, especially as hundreds of thousands of additional South Africans enter anti-retroviral treatment (ART) programmes. This situation poses huge financial dangers and risks for the country, particularly at a time when South Africa is feeling the negative effects of the global economic recession and is struggling to maintain its government budget for a wide range of pressing needs including education, transport infrastructure, housing, job creation, and other health priorities beyond HIV/AIDS.

The South African government has progressively allocated new resources to fund the response to HIV/AIDS in the 2009/10–2011/12 medium term period through conditional grants and equitable share allocations. The Medium Term Budget Policy Statement (MTBPS) for 2009 revealed that the national government had allocated an additional R900 million for the AIDS treatment programme to fund the budget shortfall expected in 2009/10, and by 2012/13 will be allocating around R11 billion to HIV/AIDS. The South African President also announced a new AIDS treatment policy on World AIDS Day (Dec 1, 2009) which stipulates that all pregnant HIV positive women with a CD4 count of less than 350 cells/mm<sup>3</sup> or with clinical AIDS symptoms regardless of CD4 count will have access to ARVs, as will all patients co-infected with HIV and TB and with a CD4 count of less than 350 cells/mm<sup>3</sup>. The President further noted that all HIV positive babies under the age of one year will receive ART. In April 2010, the President followed up with the launch of an ambitious nationwide program to test and counsel 15 million South African adults during 2010–11.

### 1.1 Brief Background on aids2031

An international exercise called aids2031 was launched in 2008 by a consortium of international partners to help assess the long run trajectory of HIV/AIDS, what can be done to reduce the number of new cases of HIV and better care for those who are infected, and how countries will be able to finance the measures they need to address HIV/AIDS in the future at lower costs and in more efficient ways than they do now. The aids2031 project has focused on how actions that are taken now can change the future of the epidemic looking ahead to the year 2031, fifty years after AIDS was first recognised.

aids2031 will issue a report in December 2010 called “*Taking a Long-Term View*,” which highlights the findings of the consortium’s nine working groups and will be the focal point for a series of public conversations and roundtables with a broad spectrum of institutions and individuals in countries around the world.



The aids2031 working group on Costs and Financing was led by the Results for Development Institute. The working group has been analysing the long-term costs and financing options for HIV/AIDS globally, regionally and for individual countries. South Africa and Cambodia were selected in early 2009 as the pioneers for this country level work, at the request of the national authorities.

Overall, the Costs and Financing Working Group has aimed to:

1. Estimate the *long-term costs* of AIDS, using a range of distinct scenarios, grounded in different future possibilities for the main cost drivers which can be influenced by countries' economic and political choices. The key questions to be answered: Where are financial needs trending for low and middle income countries over the next 22 years? How much funding will each of the scenarios require over the full period, and what will be the annual cost in 2031? What factors are likely to be most important in driving future costs upwards? Are there some "game-changing" actions that could dramatically lower future resource needs?
2. Make recommendations for *setting priorities for resource allocation*, based on evidence of intervention and programme cost-effectiveness, and for *managing financial resources in an effective and efficient manner*. The key questions here: How can governments, donors, and other key actors in national AIDS programmes use their scarce resources to prevent more infections, keep more people alive on treatment, and protect and nurture AIDS orphans? Where can they obtain the greatest gains by allocating funds to the highest impact areas, and by managing those funds more efficiently? And how can such improved allocations and management approaches be encouraged and realised in practice?
3. Construct and evaluate *long-term financing* scenarios that are adequate, equitable, predictable, and sustainable. The central issues to be addressed: How affordable are the estimated AIDS programme "price tags," annually and over the next 22 years, for individual countries and their external partners? How should the future financial burden be shared among the various sources of financing, internal and external, public (including health insurance) and private (including philanthropic organizations, industry, NGOs, and out of pocket payments). Over the next two decades, will there be important new sources, mechanisms, and channels for financing?

The Costs and Financing Working Group issued its global report, "*Costs and Choices: Financing the Long-Term Fight Against AIDS*," in June 2010. It is available electronically on the website [www.resultsfordevelopment.org](http://www.resultsfordevelopment.org).

The South African country study sought to measure the long-term costs of the HIV/AIDS response in South Africa, based on different scenarios for the scope and rate of up-take of prevention, treatment, and mitigation services, and to model their epidemiological impact.



## 1.2 Socio-economic performance and forecast in South Africa

Since South Africa's first democratic elections in 1994, there have been great improvements in service delivery to all the population and in efforts to equalise opportunities for access to quality services (Hickey, Ndlovu, Guthrie, 2003). The National Treasury sought to build investor confidence, develop the local industries, and improve infrastructure to support growth and employment creation. Between the years 1994 and 1999, there was an average annual GDP growth rate of 2.7% per year (UNDP, 2000), and the GDP per capita has gradually increased to US\$5,775 (Atlas method). Despite these advances, the Human Development Index (HDI) dropped to 0.683 in 2008, ranking South Africa 129<sup>th</sup> (out of 182), according to the Human Development Report (UNDP, 2009). Inequalities between and within provinces, as well as high unemployment rates, continue to contribute to high poverty levels. (Refer to Appendix L & M for further details).

## 1.3 HIV/AIDS Epidemiological Situation and Response in South Africa

In 2006, UNAIDS reported that: “*South Africa's AIDS epidemic—one of the worst in the world—shows no evidence of a decline.*” (UNAIDS, 2006). While there have been recent reports of reduction in prevalence (HSRC, 2009), South Africa continues to have the highest number of persons living with HIV, estimated at 5.7 million people (UNAIDS, 2009). The estimates of HIV prevalence among the general population are mainly based on the surveillance findings among pregnant women attending sentinel antenatal public clinics (ANC). The data have been collected on an annual basis since 1990, the most recent being the 2008 report (Department of Health (DOH) South Africa, 2009).

The 2008 South African ANC Survey found the overall national HIV prevalence among antenatal women aged 15–49 years, measured using the parallel test algorithm, was 29.3% (95% CI: 28.5%–30.1%). The occurrence of the HIV infection nationally has stabilised at around 29.0%, reduced slightly from 29.1% in 2006 (CI: 28.3%–31.2%) and 30.2% (CI: 29.1%–31.2%) in 2005 (DOH, 2007 & 2005). The province of KwaZulu-Natal continues to have the highest prevalence at 38.7% (CI: 37.2%–40.1%), while the lowest rate was seen in the Western Cape at 16.1% (CI: 12.6%–20.2%), highlighting the need for provincial-specific responses (DOH, 2009).

### 1.3.1 HIV/AIDS Policy Developments and Progress

The South African response to HIV/AIDS began in 1992 with the formation of the National AIDS Coordinating Committee and in 1994 the first National AIDS Plan was formulated. In 1998 the South Africa National AIDS Council (SANAC) was set up to represent partnership between government and civil society, and the National Strategic Plan (NSP) for 2000–2005 was implemented. In 2003 the South African government presented its Comprehensive HIV and AIDS Care, Management and Treatment Plan (DOH, 2003). This was after extensive mobilisation and advocacy efforts of civil society groups in the country demanding ARVs from the public health sector.

Roll-out of the ARV programme was delayed for many reasons, including the slow process of accrediting sites for the delivery, the lack of capacity at delivery level, protracted procurement procedures at national level, and weak or ambivalent support from the national political leadership. However, since the initial slow start, the numbers of people accessing treatment have been steadily and dramatically increasing. By mid-2007, there were approximately 220,000 adults and 30,000 children receiving ARVs at public facilities (Cleary, 2007). By mid-2008, Adam & Johnson (2009) using the Actuarial Society of South Africa (ASSA) model estimated that there were 568,000 patients receiving ART and by mid-2009, the government reported 630,775 patients on treatment (National Treasury, SA. 2009:105). This fast increase in the uptake of ART caused some provinces to face stock-outs and budget shortfalls in 2008 and 2009, and resulted in moratoriums being placed on the number of new patients being initiated on ART in some provinces (Ndlovu, 2009). The National Treasury had to seek additional funding from the United States President's Emergency Plan for AIDS Response (PEPFAR), and increase its Conditional Grant for ARVs for 2011/12 in its Medium Term Budget Policy Statement (MTBPS) (Ndlovu, 2009). Thus, in addition to human resources and infrastructural constraints, the costs of expanding the ART programme will be the biggest challenge to achieving Universal Access, particularly with the recently announced policy to increase the CD4 eligibility count from 200 to 350 cells/mm<sup>3</sup>, through a phased approach of pregnant women and TB patients first (DOH, World AIDS Day, Dec 2009).

### 1.3.2 The National Strategic Plan (2007–2011)

In March 2007, the South African National AIDS Council (SANAC) drafted a new Strategic Plan for the period 2007–2011 (SANAC, 2007) with the assistance of an expert task team of clinicians, health economists, scientists and activists and after several rounds of consultations with various sectors (IRIN News Plus, 15 March 2007). The Plan has been commended as comprehensive, including the roll-out of free ARVs in the public sector, but it has also been criticised as too ambitious, somewhat vague in its goals and potentially costly. The entire NSP was not costed initially, but the core components were costed by Cleary *et al.* (2007).

The NSP is based on several principles, one of them relating to financing:

**“Financial sustainability:** No credible, evidence-based, costed HIV and AIDS and STI sector plan should go unfunded. There should be predictable and sustainable financial resources for the implementation of all interventions. Additional resources from development partners shall be harmonised to align with policies, priorities and fund programme and financial gaps” (SANAC, 2007:57).

The primary aims of the NSP are to:

- Reduce the rate of new HIV infections by 50%.
- Reduce the impact of HIV and AIDS on individuals, families, communities and society by expanding access to an appropriate package of treatment, care and support to 80% of all people diagnosed with HIV and who meet the clinical guidelines for initiating treatment as set by the government.

The four priority areas of the NSP are:

1. Prevention;
2. Treatment, care and support;
3. Monitoring, research and surveillance; and
4. Human and rights and access to justice.

Each of these areas has identified interventions, which have optimistic annual target coverage rates to be achieved by 2011, and the lead responsible agency. Currently, a mid-term review of the progress towards achieving the NSP targets in the country is being undertaken. Unfortunately the results were not ready to be presented here. Refer to Appendix L for a description of the organisational structures behind the AIDS programme in South Africa.

#### **1.4 Purpose and Objectives of the South African Case Study**

The aids2031 Costs and Financing Working Group (CFWG) engaged the Centre for Economic Governance and AIDS in Africa (CEGAA) to conduct the case study research, which was done with the support of the government, key development partners (UNAIDS, World Bank, PEPFAR, etc.), and civil society organisations involved in the AIDS effort.

The objectives of the South Africa case study were:

- To undertake a review of the available literature on unit costs for HIV/AIDS interventions in South Africa, and to develop a database of these for use in the costing;
- To estimate the medium and long-term costs of the national response to AIDS under a series of scenarios, as well as their projected epidemiological impact (e.g., new and total infections, number of AIDS-related deaths, numbers needing and on treatment);
- To utilise a priority-setting model to examine options for improved efficiency in resource allocation; and
- To prepare a report that consolidates the findings of the resource needs and prioritisation in resource allocation.

## 2. METHODOLOGY

The project applied several methodologies to achieve the most accurate projections based on South African data. These are discussed below.

### 2.1 Meetings with Key Respondents: Steering Committee, DOH, DSD and other Relevant Departments, Development Partners and Service Providers

A Steering Committee was established, which comprised key representatives from the National Department of Health (DOH), National Treasury (NT), South African AIDS National Council (SANAC), development partners, business sector, and others. This Committee provided guidance and information to the research process, and determined the scenarios that were to be modelled. Steering Committee members are listed above in the Acknowledgements section of the report.

In addition, extensive meetings and interviews were held with several key stakeholders and departments, particularly the programme managers for the various HIV/AIDS services, and their costing and budget data obtained where available. For a full list of all interviewees, refer to Appendix C.

### 2.2 Review of the Literature on South African HIV/AIDS Costings

An extensive search of costing studies of HIV/AIDS services in South Africa and the region was undertaken. Published materials were accessed through on-line journal search machines, and grey materials were accessed through wider web-searches as well as through requests from all stakeholders interviewed. A limited number of South African studies were found, particularly facility-based studies. The primary source of data was the costing of the NSP done in 2007 by Cleary *et al.* This proved to be a primary source of the unit costs for the 2031 costing since these figures were accepted by government, unless there were more relevant and up-to-date studies, such as the Meyer-Rath *et al.* (2009) costing of ART and PMTCT, and Cohen *et al.* (2009) costings of some key interventions for the Provincial Strategic Plans (PSP), including commercial sex workers (CSW) and in-school educational activities.

In reviewing the available unit costs, the different cost components that had been included and excluded were identified, the assumptions used explored, and the approach taken assessed. Generally, there was a lack of standardisation of the components included, particularly with regard to overhead and management costs. Since this gross costing was taken from the perspective of the service provider, the patient (direct and indirect) costs were not included, although very few studies were found which covered these.

All the studies, including their methods and assumptions, were summarised in an excel database. In addition, a narrative report describing the range of costs, the reasons for their variance, and the selection and rationale for the unit cost to be used for the 2031 costing, was prepared. Please refer

to these documents for more details on the review<sup>1</sup>, and see Appendix D for the unit costs that were selected for the 2031 costing.

A triage was applied in deciding which unit cost to apply in the 2031 costing, in terms of the most accurate or relevant. The selection criteria were based on the following order:

- Priority given to current unit costs obtained from the relevant government departments;
- Any recent South African specific studies (such as Meyer-Rath *et al's* recent ART costing), and adjusted to 2009 prices, where necessary;
- The unit costs used in the costing of the NSP (Cleary *et al*, 2007), adjusted to 2009 prices; and finally
- The most sound available literature—mostly the unit costs used in the adjusted Resource Needs Model (RNM) (Stover, 2008), or the global default value in the RNM, all adjusted to 2009 prices. These are usually collected from countries in the Africa region, and may be assumed to be close estimates, in the absence of country-specific data.

Overall, there was a general shortage of facility-based costing studies done in South Africa. In addition, many of the departments providing services could not furnish the unit costs which they use for their budgeting purposes. Some interventions were missing South African unit costs, in which case the default values in the Resource Needs Model (RNM) were used.

#### 2.2.1 Missing Prevention Unit Costs

South African unit costs for the following HIV-prevention interventions could not be obtained:

- Workplace prevention—the costing by the Department of Public Services had not been undertaken, but fortunately Cohen *et al.* (2009) had recently undertaken an estimate for the Provincial Strategic Plan costings, which was applied.
- Men who have sex with men (MSM)—The DOH did not have this data, and organisations providing MSM services did not respond to the request for information. Therefore the global default figures in the RNM were used. Since the estimated number of MSM is relatively small, there was not a great effect on the total costs of these interventions. However, if the size of the MSM population is an underestimate, it will be important to obtain accurate national data on the costs of interventions to reach this population.
- Universal precautions, such as ensuring use of gloves, safe disposal of injections, etc.—this information was not provided by the DOH, and the Steering Committee advised that these should not be included in the HIV/AIDS costing, since they are covered by the DOH as general health care costs.

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<sup>1</sup> All papers and database are available at: [www.cega.org](http://www.cega.org)

- Intravenous drug users, such as Cost of Counselling and Testing for IDUs, Community outreach and Peer Education for IDUs, and distribution of clean needles—since no such programmes could be located in South Africa in the study period, the global default figures were used.
- Community mobilisation—DOH and DSD were unable to provide any further detail. The estimates by Cohen *et al.* (2009) were applied.

#### 2.2.2 Missing Treatment Unit Costs

- PCR tests—data was requested from NHLS but no feedback was received. The global default figures were used.
- Palliative care—it was not possible to get updated costs from the hospices providing palliative care within the study period. However, the costing of the NSP (Cleary *et al.*, 2007) had obtained some primary data from the Hospice Association, and these were applied, after adjusting for inflation.
- OI treatment other than Cotrimoxizole—the adjusted RNM (2008) unit cost was applied.

#### 2.2.3 Unit Costs Needing Improvement/Updating

The following unit costs need updating or improvements, through discussion with the relevant departments, programme managers and service providers. It would be good to see more work done on these interventions in the coming months and years, in order to have more accurate information on what is being spent and needs to be spent in the future:

- Mass media—Khomonani provided aggregate annual expenditure without details of spending components. This total amount was also used in the NSP costing, and was eventually also applied in the 2031 costing, as more accurate data was not available. Greater effort at costing the range of different mass media interventions is required.
- Teacher training—it was hoped that more accurate data could be obtained from the DOE, but they indicated they do not separate out the costs of teacher training for different topics, nor could they give one unit cost that might be applied to their training of life skills teachers. Therefore the estimate of per trainee cost used in the PSP costing (Cohen, 2009) was used.
- Mother/infant feeding—the available unit cost per week from Cleary *et al.* (2007) appeared to be too high. We assumed the unit cost of R884 could be adequate for a month and then computed the cost per annum.

Refer to Appendix D for the final unit costs that were applied in this 2031 costing.

### 2.3 Collection of the Current Coverage Rates

All the relevant government departments were asked for the current coverage rates of their particular services. Very few were able to provide these, or only had rough estimates—even the numbers of persons currently on ARVs was challenging since most provinces only had cumulative

figures (i.e. including those patients that had died or were lost to follow-up). In the end, the numbers on treatment were those as utilised in the Boston University HERO ART costing (Meyer-Rath *et al*, 2009), based on the ASSA estimates. Again, the lack of accurate and comprehensive data on AIDS service coverage highlights the urgent need for the national and provincial AIDS authorities to invest more in routine monitoring and reporting of service activities.

## 2.4 Developing the Scenarios

The aids2031-South Africa study team, guided by the national Steering Committee, developed three distinct AIDS programme scale up scenarios for South Africa. These provide a range of interventions, varying their degree of coverage rates and year of attainment. The team modelled the impact of these scenarios on the epidemic and on the financial resources required to implement scaled up prevention, treatment and mitigation in the coming years.

The choice of the scenarios was the responsibility of the Steering Committee, which considered a number of key drivers, such as government's political will and level of commitment, the expected rate of change in social and sexual behaviour, the availability of funding, and the technical capacity of medical and non-medical organisations to deliver expanded HIV/AIDS services.

The scenarios allowed the analysis:

- To address the uncertainty associated with long-term projections such as those required in the aids2031 activity;
- To examine resource requirements under a range of possible futures—to estimate what “might” be, not what “will” be; and
- To be constructed around a series of ‘drivers’ which could be the most important influences on the actions of interest.

Once the scenarios were agreed upon by the Steering Committee, as well as the target coverage rates for each of the interventions under each scenario, the Spectrum<sup>2</sup> and Resource Needs Estimate (RNM<sup>3</sup>) models were calibrated to match each scenario. Thus both the epidemiological and cost projections could be created around these different possibilities. The scenarios differed from those used by aids2031 in its global projections (Hecht *et al*, 2009).

The Steering Committee suggested that the first scenario should be based on the current interventions in the NSP, of which not all have been undertaken in South Africa, and which in theory should reach their targets by 2011, after which coverage would plateau. Although this resulted in a very steep increase in funding to achieve the 2011 targets, the Steering Committee felt

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<sup>2</sup> Spectrum® is a model developed to model the progression of HIV/AIDS in any country. It is constantly updated with the most recent country-level survey data. The version used included GOALS.

<sup>3</sup> The RNM is a model developed by Futures Institute, based in Excel, which undertakes a gross costing of the response to HIV/AIDS in any country. It uses Spectrum estimates of numbers in need of the various interventions, applies the current and target coverage rates, and multiplies the numbers projected to be receiving the service by the unit cost, for each intervention.



it was important to model the government's formal policy commitments, which would provide valuable data for their Medium Term Expenditure planning.

The second scenario the Steering Committee suggested was an 'Expanded NSP,' under which South Africa implements all the intended interventions and additional ones to address underlying causes of vulnerability to HIV/AIDS—thus the most comprehensive package of services. However, because of the ambitious scope and targets in this scenario, it was decided to move the date of achievement of its targets to 2021, 10 years after the narrow NSP target year, as this was thought to be more realistic (except for the ART targets, which reaches its peak in 2015/6 because of the high rate of achievement so far).

The third and final scenario chosen by the Steering Committee is the most modest option, "Hard Choices" in prevention and mitigation. Hard Choices was based on the assumption that funding for AIDS in South Africa will continue to be highly constrained, so decision-makers will be forced to limit or cut certain services which are deemed to be less cost-effective or lower priority, while increasing efforts on a small number of prevention activities thought to be the most cost-effective. Under this scenario, the treatment targets are kept the same as for the narrow NSP.

Each scenario is described in greater detail below:

### **1. Narrow NSP by 2011**

This represents the current South African interventions reaching the targets of the national Strategic Plan (NSP) by 2011. It makes the following assumptions:

- Based on interventions currently being provided
- Political will to achieve universal access is strong
- Rapid scaling-up of prevention & treatment interventions
- Achieving the NSP targets by 2011
- ART—old regimen at 200 CD<sub>4</sub> criterion
- PMTCT single dose till 2009, replaced by dual therapy in 2010
- Early paediatric ART from 2009
- No male circumcision
- Mitigation—currently being provided by the government including the Foster Care Grants (FCG)

### **2. Expanded NSP by 2021**

This scenario assumes that an expanded effort that would go beyond current NSP plans, in order to reach higher treatment targets, and investment in social programmes for women, children, and other vulnerable groups, with a greater focus on interventions that can reduce vulnerability to AIDS. In particular, the Expanded NSP takes a wide ranging, comprehensive approach, incorporating prevention interventions aimed at addressing the causes of vulnerability to HIV, scaled up treatment and mitigation efforts. It assumes their achievement by 2021, except for the new treatment targets which are reached by 2015/16.

The following assumptions were made:



- Achieving entire NSP and extra prevention (such as male circumcision, empowering commercial sex workers, reducing violence against women) and care interventions (such as increased target coverage rates for OVCs) by 2021
- ART—new regimen with CD4 350 eligibility from 2010 (targets reached by 2015)
- PMTCT single dose till 2009, replaced by dual therapy in 2010
- Early paediatric ART from 2009
- Male circumcision introduced 2010, reaching 60% by 2021
- In addition to achieving the NSP targets, other interventions were costed to 2021:
  - Expanded workplace programmes
  - Increased education and behaviour change for the general population
  - Enabling/ empowering commercial sex workers
  - Expanded efforts for youth-out-of-school
  - Scaled-up post-exposure prophylaxis (PEP) services
  - Reducing violence against women
  - Broad poverty alleviation and development were not included, but expanded social support, including the FCG, for OVCs were included. Such interventions would increase the overall costs, but could not be linked to positive epidemiological outcomes in Spectrum and GOALS.

### 3. Hard Choices by 2015

In the climate of constrained resources, this scenario assumes that some programmes are scaled down while the coverage of others are increased, in an attempt to focus on the most cost-effective prevention interventions, while maintaining a robust treatment programme. In addition, difficult choices (which could be politically untenable) such as reducing social mitigation spending are included in this scenario. The following assumptions were applied:

- All targets achieved by 2015, except ARVs which remained at 2011
- ART was kept using the old WHO regimen and with the eligibility criteria at 200 CD4 cells/mm<sup>3</sup>, and according to the NSP target of Universal Access by 2011
- Increased coverage (from narrow NSP) for:
  - Condoms, male circumcision, CSW, MSM, STI treatment
- Maintaining current coverage (same as for narrow NSP) for:
  - VCT, Foster Care Grants, ART, youth-in-school
- Reduction below NSP targets for:
  - Community mobilisation, mass media, youth-out of-school, workplace, home-based care (HBC), palliative care, food parcels, uniforms and other mitigation for OVCs.

For each scenario, the current coverage rates as well as the target coverage rates for every intervention had to be agreed upon by the Steering Committee, based on South African data. The table below indicates which interventions were included under each scenario, their baseline rates in 2007, and their target coverage rates for the specific target years.

**TABLE 1: Target Coverage Rates for the Scenarios in South Africa**

Intervention	Unit of Measure	BASELINE	SCENARIO 1	SCENARIO 2	SCENARIO 3
		Coverage as at 2007	NARROW NSP Goals by 2011	EXPANDED NSP+ by 2021	HARD CHOICES <sup>4</sup> by 2015
Community mobilisation	% of ward-based vulnerable communities covered	30%	30%	80%	15%
Mass Media	% of adult population having heard/seen communication	81%	81%	90%	40%
VCT—% tested in last 12 months	% of adults tested in the last 12 months	24.7%	25%	90%	25%
Condom promotion	% cas.sex acts using condom, or % of adult males provided	55%	60%	90%	80%
Youth: In-School	% in-of-school youth reached, or % of facilities providing life-skills	80%	80%	98%	80%
Youth: Out-of-school	% out-of-school youth reached	35%	50%	85%	25%
Workplace	% of workplaces covered	40%	50%	80%	40%
Sex work	% sex workers reached by intervention per year or % of organised groups covered	5%	30%	95%	50%
MSM	% MSM reached by intervention per year or % of groups covered	5%	20%	70%	50%
IDU: Outreach	% of IDUs receiving harm reduction outreach, or number of rehab facilities	5%	20%	60%	20%
IDU: Needle exchange	% of IDUs receiving needles	0%	0%	40%	0%
IDU: drug substitution	% of IDUs receiving substitute therapy	0%	0%	40%	0%
STI treatment	% of facilities providing STI services	60%	60%	100%	60%
Male circumcision	% of adult males currently circumcised	35%	35%	90%	70%
PMTCT	% HIV positive pregnant women treated with ARV	69%	80%	95%	80%
ART—adults	% of adults in need receiving	63%	70%	90%	70%
ART—children	% of children in need receiving	59%	70%	90%	70%

<sup>4</sup> NB. All the treatment & PMTCT targets of the NSP were maintained in the Hard Choices Scenario. Only the prevention interventions coverage rates were reduced or increased.

Intervention	Unit of Measure	BASELINE	SCENARIO 1	SCENARIO 2	SCENARIO 3
		Coverage as at 2007	NARROW NSP Goals by 2011	EXPANDED NSP+ by 2021	HARD CHOICES <sup>4</sup> by 2015
PEP	% of facilities providing post-sexual assault care	30%	40%	90%	80%
HBC for CHHs	% of child-headed HHs receiving CHBC	50%	50%	95%	10%
HBC—CGs stipends	Numbers of CG stipends provided per annum	23,394	23,394	75,000	4,679
Other vulnerable (miners, transport, etc.)	% of facilities/workplaces providing prevention services	50%	50%	95%	50%
Prisoners	% of prisons providing prevention services	50%	50%	95%	50%
Formula milk for children of HIV+ women	% of children of HIV+ women with replacement feeding	50%	40%	80%	10%
OI treatment (cotrimoxizol) adults	% of eligible adults receiving	20%	50%	80%	40%
OI treatment (cotrimoxizol) children	% of facilities providing to children at time of diagnosis	30%	50%	90%	40%
Food support to HHs (No HHs)	Number of HHs receiving food support per annum	400,000	560,000	700,000	140,000
TB screening of HIV+ patients	% of adult & children TB patients screened for HIV	40%	60%	100%	60%
Palliative care—adults	Number of adults receiving terminal care (NSP,79)	200,000	240,000	336,000	100,000
Palliative — children	Number of children receiving terminal care	20,000	24,000	33,600	6,000
Food support - children	Numbers of children receiving	734,409	881,291	90%	30%
Food parcels	Numbers of persons receiving	186,462	223,754	90%	55,939
Nutritional supplements	Numbers of persons receiving	87,290	104,748	90%	26,187
Uniforms for children	Numbers of children receiving	19,729	23,675	80%	5,919
Grants : FCG*	Numbers/% of children receiving	484,924	60%	90%	60%
Vulnerable—elderly HBC	% of elderly receiving HBC	50%	50%	90%	25%

\* Note that for the FCG, only a share that was assumed to be for HIV-related orphans was included in the costing (approximately 56%).

## 2.5 Modelling the Epidemiological Trends to 2031

The latest version of Spectrum was used for the epidemiological modelling, but the numbers of adults on ART were calibrated to the DOH current figures and the ASSA estimates to 2016. Guidance on this process was received from Dr. Leigh Johnson (UCT) and Dr. John Hargrove (SACEMA), and Kelsey Case from Imperial College London undertook all aspects of preparing and running the different scenarios in Spectrum, based on South African data. A few anomalies occurred in the adult death projections, and therefore these are not presented here. In addition, a later version of Spectrum addressed the slight over-estimate of children receiving ART. Refer to Appendix A for all the assumptions used in the Spectrum modelling.

## 2.6 Applying the Prioritisation Model to Examine Options for Improved Efficiency in Resource Allocation

After reviewing the available mathematical models of HIV transmission dynamics, the prioritisation model utilised was the GOALS model in Spectrum, which incorporates the impact of prevention interventions and treatment and was able to produce projections through to 2031. The GOALS model applies an impact matrix which assumes different levels of effectiveness for the different interventions based on international data. The effectiveness coefficients of the impact matrix were derived from the data gathered during three rounds of systematic literature reviews of over 200 studies that evaluated HIV prevention interventions in developing countries and the impact of these programmes on behaviour change (Bollinger, 2008).

## 2.7 Costing Using the Resource Needs Model (RNM) Costing Model

Futures Institute adjusted the RNM to 2031, and CEGAA made further adjustments to suit the South African situation. The model was then populated with the selected unit costs, current coverage rates and other assumptions based on South African data. For all these data refer to Appendix B. Then for each scenario, the target coverage rates and years were adjusted accordingly, and the Spectrum outputs were inserted into the RNM. This generated the gross costing for each scenario, using the simple formula of: *population in need x coverage rate x unit cost*. For all the interventions included in the RNM, refer to Appendix A, and to table 1 above for all the target rates applied in each scenario, in both the RNM and the Spectrum files.

The ART costs were estimated by Meyer-Rath et al (2009) for the NDOH and these were applied to all three scenarios.

## 2.8 Measurement of the Public Allocations for HIV/AIDS Programmes in South Africa

CEGAA undertook the analysis of the national budgetary allocations made to the HIV/AIDS programmes in South Africa. We were unable to project the future discretionary allocations made by provinces from their own budgets based on the equitable share (ES) division of revenue, but utilised the DOH estimates. In addition, the provinces' disaggregated expenditure data by programme also could not be obtained. South Africa is planning to undertake a comprehensive National AIDS Spending Assessment (NASA) which will address this gap in available expenditure

data. The NASA will also cover external sources as well as funding from the private sector. Since this data was not readily available, it was not possible to project the total available funds in the near future, and therefore the financing gap could not be measured. Once the NASA is completed in 2011, the AIDS resource needs estimates and the information on actual spending can be brought together in order to calculate resource gaps in various programme areas, and to recalibrate the national strategic plan in the light of these data.

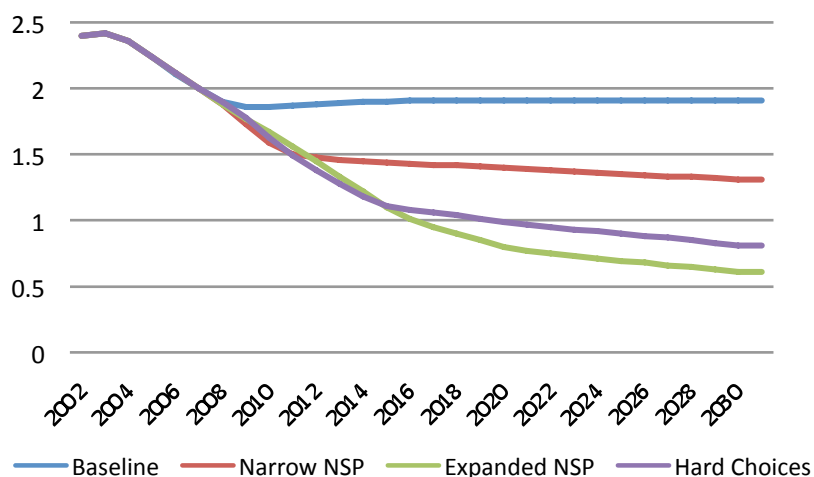
### 3. FUTURE EPIDEMIC TRENDS AND POSSIBLE IMPACT OF THE SCENARIOS

This chapter presents the projected impact of the three scenarios on the epidemiological indicators, as generated by Spectrum. The impact of the choice of interventions and their coverage rates on the longer-term epidemiological outputs were modelled by GOALS.

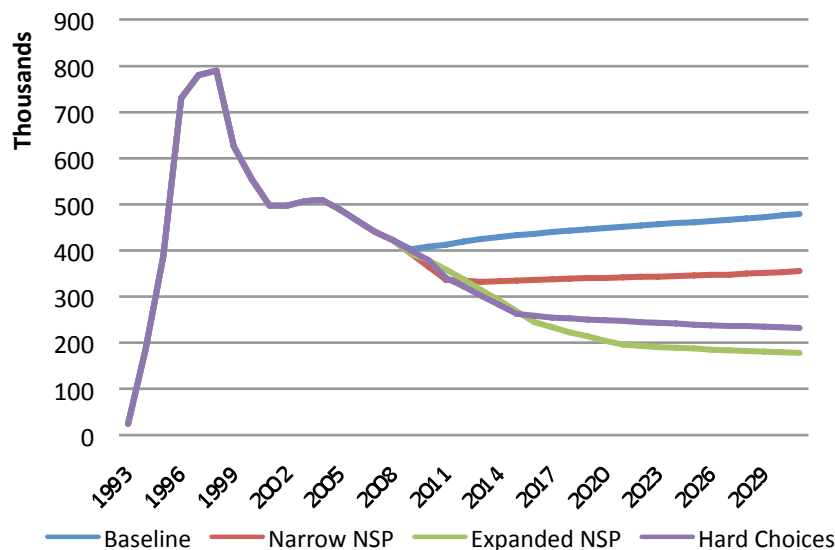
#### 3.1 Projected HIV Infection Rates in South Africa

The figures 1, 2 and 3 below show the projected impact of the various scenarios on the HIV incidence rate and the numbers of new infections, annually and accumulated, among adults (15–49 years). The incidence rate (the percent of adults infected each year) under the baseline scenario will remain at just under 2%, while under the Narrow NSP it declines to around 1.4% in 2016, to 1.1% under Hard Choices, and to just less than 1% in the Expanded NSP, with further reductions to around 0.6% by 2031.

FIGURE 1: Projected Adult (15–49 yrs) HIV Incidence, 2002–2031

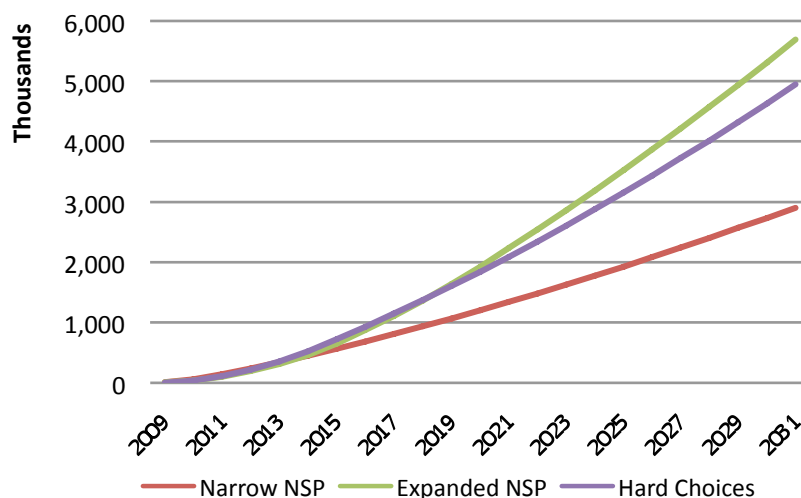


In 2009, Spectrum estimates approximately 450,000 new infections per year. Achieving the NSP goal of a 50% reduction in new infections by 2012 would mean reducing to 225,000 new infections a year or less. The baseline indicates that by just maintaining the 2009 coverage rates, new infections would instead increase to reach 500,000 in 2031, due to the growing population size. In the Narrow NSP, new infections drop to 350,000 in 2011 but then show a gradual increase, also due to the growing population size. Only the Expanded NSP brings this down to 200,000 in 2021 and even further through 2031, averting 300,000 new infections in that year alone compared to the baseline. The NSP goal would thus be achieved, but not until 2017.

**FIGURE 2: Projected New Adult (15–49 yrs) HIV infections, 1993–2031**

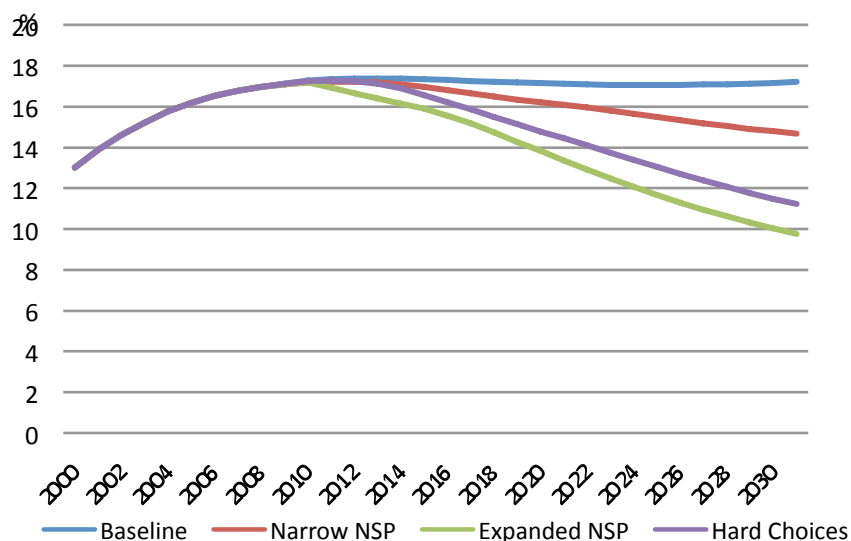
In 2031, the Narrow NSP would avert just over 100,000 infections more than the baseline, and the Hard Choices would avert almost 200,000 more infections than the baseline. In both scenarios, the lowest number of annual new infections would remain above the NSP goal for prevention.

As can be seen, there is no scenario that ends all new infections, even two decades from now. Overall, under the three scenarios another 5 to 7 million South Africans are shown to become infected with HIV. This is due to the deeply entrenched HIV epidemic in South Africa, and also due to the lack of effective prevention measures to slow the main transmission of HIV in the country (according to the Modes of Transmission study, 2010 pending) which is occurring through heterosexual, concurrent multi-partnerships. However, the Expanded NSP scenario would have a significant impact on the numbers of new infections, with the expanded ART programme also reducing infectivity. Thus the number of potential infections averted would be an important gain, as shown in Figure 3 below: compared to the baseline, almost 6 million infections are averted by 2031 under the Expanded NSP scenario, 5 million under the Hard Choices scenario and 3 million under the Narrow NSP.

**FIGURE 3: Cumulative HIV Infections Averted (compared to Baseline), 2009–2031**

The above graph shows the importance of continuing to increase the coverage rates of all interventions beyond their 2009 levels, so as to achieve these important infections averted. Despite these important achievements, HIV prevalence will remain high, as shown below, partly due to the effective treatment and its high coverage rates for all scenarios that will keep more people alive for longer periods, thereby maintaining the pool of HIV-infected persons in the population.

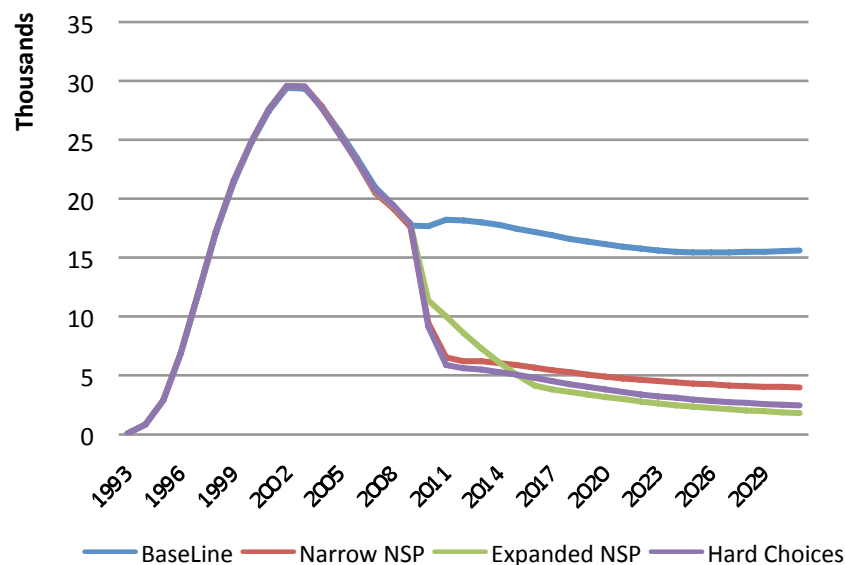
**FIGURE 4: Projected Adult (15+yrs) HIV Prevalence, 2000–2031**



If the current coverage rates of all interventions are maintained, the comparator baseline shows that the HIV prevalence rate would stabilise at around 17% for adults (15+ years), and not show any decline. The Expanded NSP scenario would steadily reduce these levels to around 10% by 2031. Under the Narrow NSP scenario, the HIV infection rate would drop to about 15%, and to just under 12% in the Hard Choices scenario. These projections indicate that HIV is heavily entrenched in South Africa, and even with the widest range of the best interventions, at least 10% of the population will remain infected, unless there are successful innovations in a vaccine or cure.

### 3.2 Child Mortality Due to HIV/AIDS

In all the scenarios modelled, high coverage rates for PMTCT are achieved, and the expanded NSP also includes ARVs for children less than one year. As a result, infant deaths drop significantly, with almost 15,000 infant lives saved per annum from as early as 2011/12 and maintained at this level to 2031, as compared against the baseline (using a constant 2009 coverage rate). This shows the importance of achieving the government's NSP targets by 2011 with regard to the roll-out of the PMTCT, which has been plagued by various delays. Even with expanded efforts to reach 95% of HIV infected pregnant women and treat infected infants, there would still be between 2,000 and 4,000 infant deaths per annum by 2031, due to HIV transmission through breast-feeding and some treatment failure for infants on ARVs.

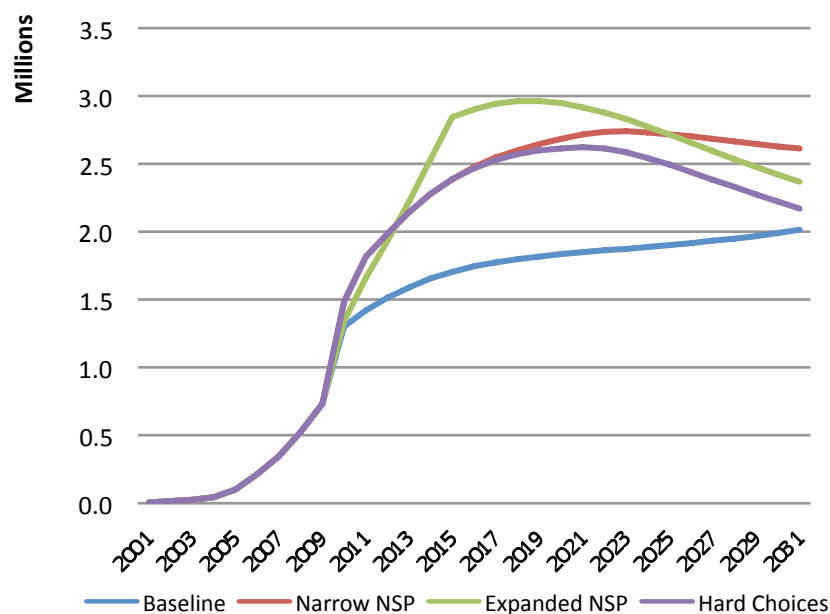
**FIGURE 5: Projected HIV-related Infant deaths (<1yr), 1993–2031**


### 3.3 Numbers of Patients Receiving ART in South Africa

The Spectrum model was calibrated to replicate the ASSA and NDOH estimated numbers of patients on ART by 2007 (approximately 750,000). Thereafter the Narrow NSP and the Hard Choices scenarios maintain similar coverage rates on the old regimen and a CD<sub>4</sub> count of 200 cells/mm<sup>3</sup> for eligibility, while the Expanded NSP scenario takes into account the new regimen (as promoted by WHO in 2009), and the increased CD<sub>4</sub> eligibility of 350 cells/mm<sup>3</sup> (but with gradual roll-out, to pregnant women and TB patients first). The baseline assumes a current coverage rate of 60% of need from 2009, resulting in slightly increasing numbers on ART because the base of new infections would still be growing.

The modelling shows the number of adults (15–49 years) on ARVs in South Africa continuing to increase in the coming years, with the greatest increase for the Expanded NSP, primarily due to the new CD<sub>4</sub> eligibility being rolled out, reaching a maximum of almost 3 million adults by 2021 (three times those on ART in 2010), but thereafter decreasing to about 2.3 million by 2031.

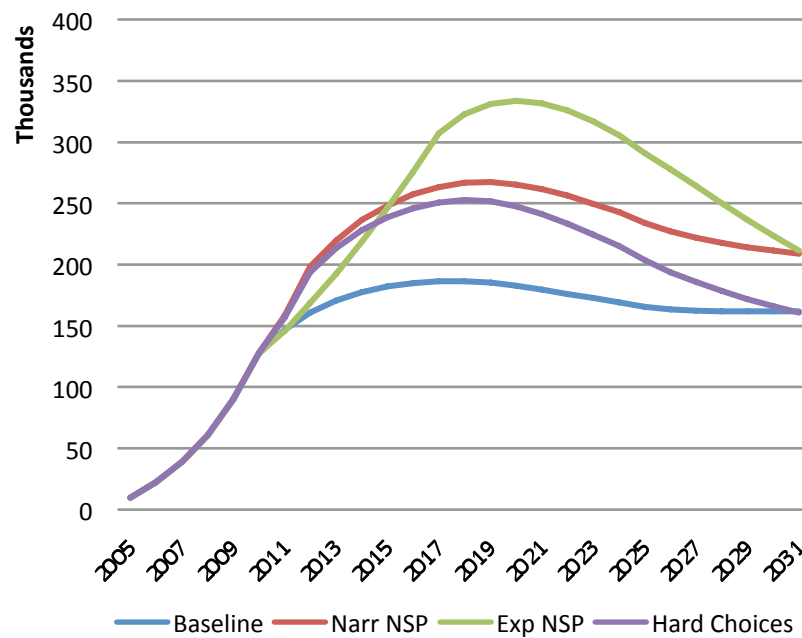


**FIGURE 6: Total Number of Adults (15–49 yrs) Receiving ARVs in South Africa, 2001–2031**

For the Narrow NSP and the Hard Choices, the numbers remain similar until about 2020 at around 2.5 million on treatment, and thereafter the Hard Choices declines slightly. The bottom line: under all conceivable scenarios, South Africa's treatment programme will grow by two to three times the current numbers of patients on ARVs over the next ten years, with a peak in about 2020 and then some reduction in the size of the treatment cohort as the prevention interventions effects are felt in reducing HIV infections.

Achievement of these numbers on ART will be extremely challenging for South Africa, requiring major increases in funding (refer to the next chapter for details) and a large expansion of the health care delivery system. Therefore there will be need not only to rapidly improve and expand the public health infrastructure and personnel, but also for the private sector to step up its delivery of these services, through businesses, private medical insurance schemes, and public-private partnerships (PPPs). There is also the question of whether the proposed national health insurance scheme will be able to cope with these vastly increased numbers on treatment. The prospect of greatly increased treatment needs should also prompt the government to seek efficiencies in its ART programme, through efforts to develop step-down and nurse-initiated treatment options and lower prices for AIDS drugs, tests, and other commodities.

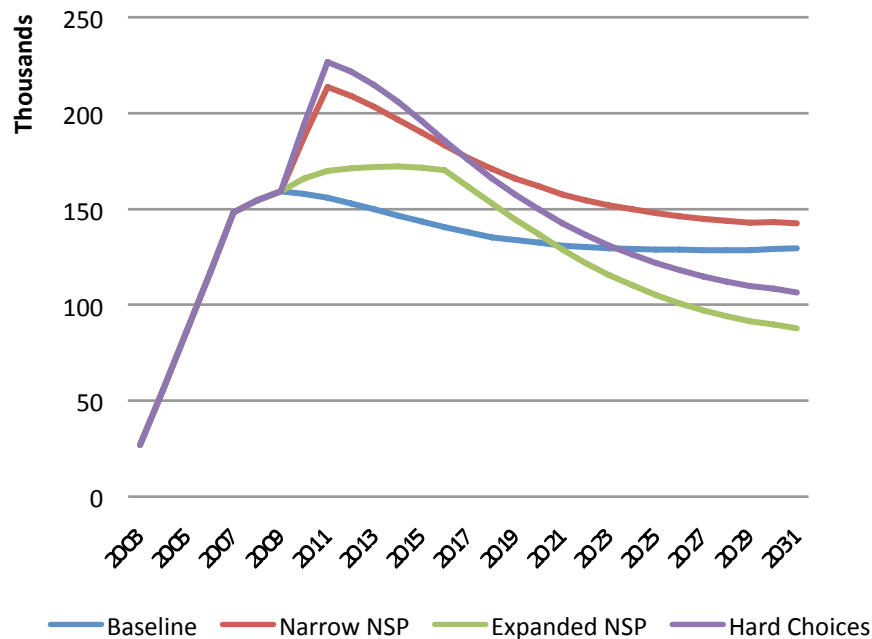
Similarly the number of children on ART is likely to increase steadily for all scenarios, especially with early paediatric ART initiated in 2009. The figure below shows the numbers of children estimated to be on ART under each scenario.

**FIGURE 7: Total Number of Children (0–14yrs) Receiving ARVs, 2005–2031**


In 2009, the ASSA model estimated that there were almost 90,000 children on ART. Since all scenarios kept the same target coverage rates but the dates of their achievement differed, in the Expanded NSP the paediatric cohort reaches a maximum of almost 325,000 children by 2020, while the Narrow NSP and Hard Choices both peak at about 250,000 children on treatment by 2015. After 2020, all scenarios show the numbers of children on ART gradually decreasing to between 250,000 and 150,000 by 2031, due to the effectiveness of PMTCT and other prevention interventions.

Thus the expansion of PMTCT is critical to reduce the number of children requiring ART. Expanding PMTCT to achieve 95% coverage leads to the number of women covered rising from about 150,000 in 2009 to almost 250,000 by 2011/12 for the Narrow NSP and Hard Choices. In the Expanded NSP, uptake is more gradual, reaching around 175,000 women by 2018 (Figure 9). Under the Expanded NSP, with its broader scope of prevention interventions, the number of women of reproductive-age who are HIV infected is lower as compared to the other scenarios, and thus the numbers who need to be enrolled in PMTCT decrease more rapidly, to around 80,000 by 2031.

FIGURE 8: Total Number of Women Receiving PMTCT, 2003–2031



### 3.4 Modes of Transmission in South Africa

Within the Spectrum and Goals models, there are 5 risk groups:

- Low risk heterosexual refers to those persons in a monogamous relationship.
- Medium risk heterosexual—persons who have casual sex, or more than one partner, but do not have commercial sex.
- High risk heterosexual—persons who provide or make use of commercial sex.
- Injecting drug users
- Men who have sex with men

In the Southern African countries a large driver of the HIV infection, according to the Modes of Transmission (MOT) studies, is the high occurrence of multiple concurrent heterosexual partnerships. It is difficult to model such multiple concurrent partnerships, something which was outside the scope of this project and beyond the capabilities of the models used. However, we attempted to deal with multiple concurrent partnerships when fitting the model by increasing slightly the parameter that multiplies the base transmission rate in the initial, high viremia stage of infection, which would make the virus spread faster.

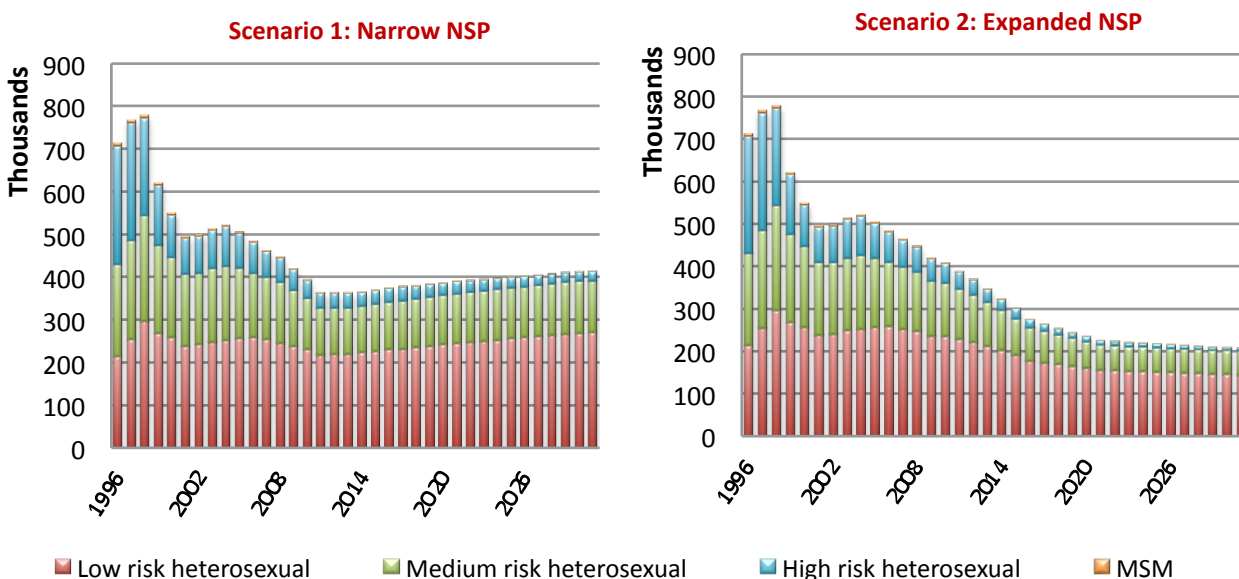
The MOT studies in sub-Saharan Africa have shown that those groups defined by UNAIDS as ‘most at risk,’ such as commercial sex workers (CSWs), intravenous drug users (IDUs) and men who have sex with men (MSM), actually contribute relatively small proportions of the total new infections. This is the case in South Africa because even though IDUs, MSM, and CSWs do have a high probability of becoming infected and of transmitting HIV, they account for a small

percentage of the total population. The majority of infections are occurring among medium and low risk individuals. A good example of this pattern is from Uganda, where the MOT study found that in 2008 CSWs, their clients and partners of clients contributed only 10% of new adult infections, while MSM and IDU contributed less than 1%, while 46% were among persons reporting multiple partnerships and their partners (Wabwire-Mangen *et al*, 2009).

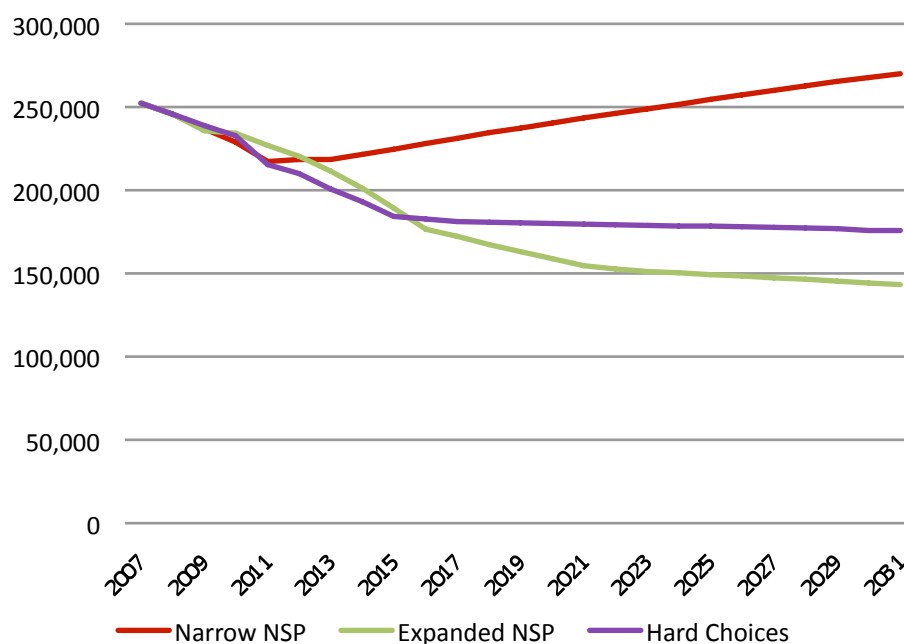
Thus “low risk” groups such as married women reporting that they are in monogamous relationships and “medium risk” persons such as men and women with several concurrent sexual partners account for the large proportion of the adult population of South Africa, and will continue to do so over the coming decades.

The figures 10 and 11 below show the impact of the scenarios on these different groups. Under the Narrow NSP the number of new infections levels out at around 400,000 per year, with almost 300,000 (three quarters) of these being amongst the low risk heterosexual group. Under the Expanded NSP, there is a far greater reduction in overall infections, with only about half of these (100,000 per year) among low risk heterosexual groups.

**FIGURE 9: Impact of the Narrow and Expanded NSP Scenarios on the Number of New Infections among Vulnerable Groups**



When considering only the ‘low risk’ group, Figure 10 shows the impact of each scenario on the number of new infections amongst the persons in ‘monogamous’ heterosexual relationships, indicating that a significant reduction in infections amongst the low risk heterosexual group in South Africa will be achieved only under the Expanded NSP scenario. The Hard Choices also has limited impact on infections in this group, though infections increase at a slower rate than in the Narrow NSP, in large part due to male circumcision under Hard Choices.

**FIGURE 10: Numbers of New Infections in the Low Risk Heterosexual Group, by Scenario, 2007–2031**

In summary, the epidemiological projections made here suggest that in the absence of a vaccine to prevention HIV infection or a treatment leading to a cure for AIDS, the epidemic is likely to continue in South Africa at a high level for the coming decades. This is a result of the large numbers of infections which have already occurred over the past two decades, and the sexual dynamics that drive the epidemic in South Africa. However, with expanded prevention and ART, greater impact can be achieved.

To conclude, the scenarios modelled here show that South Africa does have choices in how it designs and implements its national AIDS programme, and these will lead to very different outcomes.

#### **4. MEDIUM AND LONG-TERM COSTS ASSOCIATED WITH DIFFERENT HIV/AIDS PROJECTION SCENARIOS**

As explained earlier, costing of the scenarios was undertaken using the Resource Needs Model (RNM), which applies the formula: *total population in need x coverage rate x unit cost*. For each intervention, the model was populated with South African data for each of the three components of the formula, including the current coverage rates as the starting point in 2009. Where South African data was not available, the RNM default value was applied. Please refer to Appendix B for the assumptions for every intervention, and Appendix D for the unit costs applied. All the unit costs were adjusted to 2009 prices, and the scenario costs were expressed in constant 2009 terms (with no inflation factor built into them). There are many uncertainties in undertaking such long-

term predictions, and therefore these figures are meant to provide approximations and are not definitive amounts. They can nevertheless assist policy makers to consider the future implications of their choices, and to plan accordingly, including deciding how much funding is needed, how to spend it wisely, and how to mobilise adequate resources.

The estimates of resources required for the long-term response to HIV/AIDS in South Africa are presented below, according to each scenario. Firstly, the totals for each scenario are provided, and then specific figures are given for each of the four priority areas (prevention, treatment, mitigation, and policy, administration, and research). Thereafter, the in-depth figures are given for each scenario and their package of interventions. Refer to Appendix A for the list of interventions included in the RNM, and to Appendices I to K for further details of all the interventions' costs for each scenario.

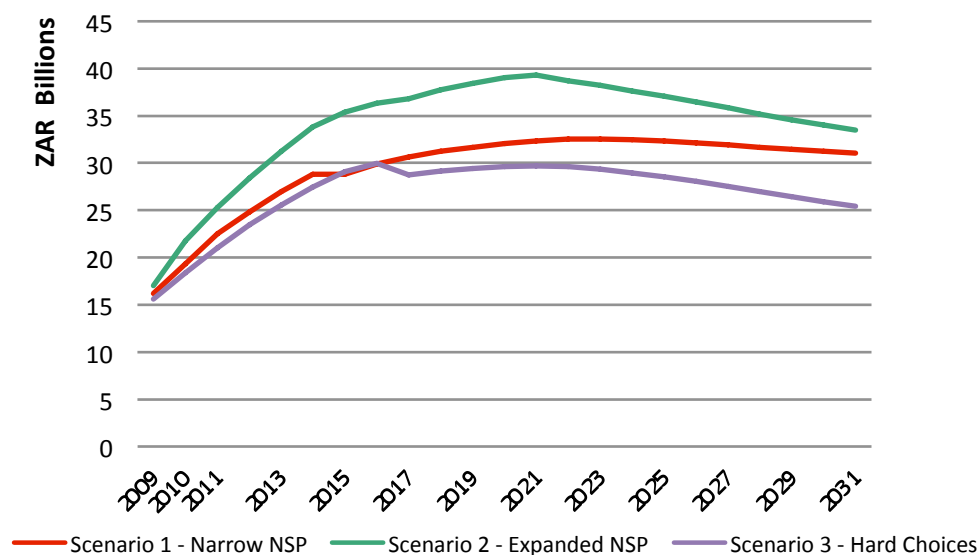
Since we modelled the future costs of the entire national response to HIV/AIDS in South Africa, the resource needs presented here are not limited to public sector services, but also include services financed and provided by the business sector, NGOs, and the external partners.

#### **4.1 Summary of Resource Estimates and Comparisons among the Three Scenarios**

This section attempts to compare the three scenarios according to their total costs and by each priority area. What is striking is the rapid rise in AIDS costs over the coming decade. Under all three scenarios, resource needs increase from around R16 billion (US\$2.1 billion) per year in 2009 to R29–35 billion (US\$3.8–4.7 billion) annually in 2015, and to around R30–39 billion (US\$3.9–5.2 billion) annually by 2021. In other words, the financial burden of fighting HIV/AIDS in South Africa can be expected to double its current level, over the course of the next ten years.

The variations among the costs of the different scenarios are not large. The Expanded NSP is the most expensive, reaching a maximum of R39 billion per year in 2021, later than in the other scenarios, because of the assumed slower rate of increasing coverage. Costs under the Expanded NSP fall to R33 billion during 2021–31, and decline further in subsequent years.

**FIGURE 11: Total HIV/AIDS Resources Required by Scenario, 2009–2031 (ZAR billions)**



The Hard Choices option is the least expensive option, because of cutting back on less effective prevention services while expanding those which are more effective, such as male circumcision, and also significantly lowering mitigation interventions.

The table on the following page provides the figures for each scenario, firstly by the priority areas and by the total amount of resources required. It shows that:

- The total costs for the *Narrow NSP* increase from around R16 billion in 2009, to R29 billion in 2015, peaking at R33 billion in 2021, whereafter they plateau until 2031. The overall costs for the *Narrow NSP* for the whole period (2010–2031) come to R658 billion (US\$89 billion).
- The total costs for the *Expanded NSP* increase from around R17 billion in 2009, peaking at R39 billion in 2021 and dropping to R33 billion by 2031. The overall costs for the *Expanded NSP* for the whole period (2010–2031) come to R765 billion (US\$101 billion).
- The total costs for the *Hard Choices* increase from around R16 billion in 2009, peaking at around R34 billion in 2021, and then decreasing to R25 billion by 2031. The overall costs for the *Hard Choices* for the whole period (2010–2031) are R598 billion (US\$80 billion).

**TABLE 2: Total HIV/AIDS Resource Needs Estimate for Different Scenarios in South Africa, 2009–2031 (ZAR millions)**

	2009	2010	2011	2015	2021	2031	Total (2010–2031)
<b>PREVENTION Activities (ZAR millions)</b>							
Scenario 1 - Narrow NSP	3,580	3,859	4,139	4,394	4,343	4,361	94,799
Scenario 2 - Expanded NSP	3,807	4,866	5,344	7,702	10,253	10,047	192,150
Scenario 3 - Hard Choices	3,302	3,501	3,566	3,866	3,450	3,454	77,428
<b>TREATMENT Activities (ZAR millions)</b>							
Scenario 1 - Narrow NSP	9,832	12,256	14,744	20,174	23,389	22,824	470,486
Scenario 2 - Expanded NSP	10,418	13,675	16,152	22,228	22,566	19,007	454,141
Scenario 3 - Hard Choices	9,521	11,851	14,287	21,485	22,194	18,870	440,602
<b>MITIGATION &amp; OVCs (ZAR millions)</b>							
Scenario 1 - Narrow NSP	2,718	3,154	3,537	4,151	4,475	3,729	90,427
Scenario 2 - Expanded NSP	2,718	3,123	3,661	5,255	6,280	4,260	114,754
Scenario 3 - Hard Choices	2,718	2,935	3,087	3,568	3,899	2,965	77,683
<b>POLICY, COORD, MGMT, etc. (ZAR millions)</b>							
Scenario 1 - Narrow NSP	65	77	90	115	129	124	2,623
Scenario 2 - Expanded NSP	80	102	118	165	184	157	3,577
Scenario 3 - Hard Choices	62	73	84	116	118	101	2,383
<b>TOTAL RESOURCES REQ (ZAR millions)</b>							
Scenario 1 - Narrow NSP	16,194	19,346	22,509	28,834	32,335	31,037	658,336
Scenario 2 - Expanded NSP	17,022	21,766	25,274	35,351	39,282	33,470	764,622
Scenario 3 - Hard Choices	15,603	18,360	21,023	29,055	29,662	25,390	598,096
<b>TOTAL RESOURCES REQ (US\$ millions)</b>							
Scenario 1 - Narrow NSP	\$ 2,159	\$ 2,579	\$ 3,001	\$ 3,845	\$ 4,311	\$ 4,138	\$ 87,778
Scenario 2 - Expanded NSP	\$ 2,270	\$ 2,902	\$ 3,370	\$ 4,713	\$ 5,238	\$ 4,463	\$ 101,950
Scenario 3 - Hard Choices	\$ 2,080	\$ 2,448	\$ 2,803	\$ 3,874	\$ 3,955	\$ 3,385	\$ 79,746

Among the different components of HIV/AIDS programme costs, treatment accounts for the lion's share. In 2010 under the three scenarios, treatment represents 63% of all resources required, and this remains in this range up to 2015-2021, rising to as much as 74% under one of the scenarios, as South Africa expands its ART efforts. There is a levelling off in projected treatment spending over the next decade to 2031, and even a drop under the Expanded NSP, but treatment continues to account for around two-thirds of total HIV/AIDS resource needs.

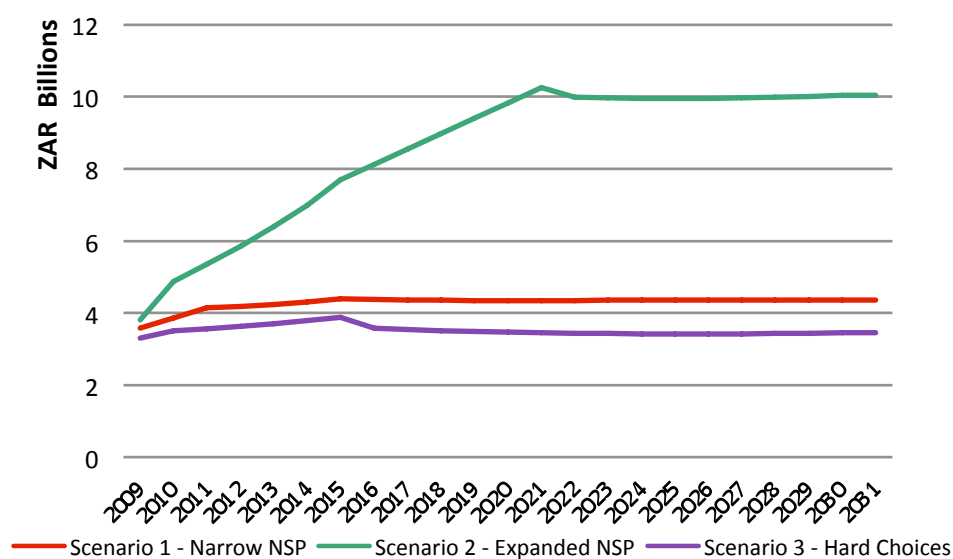
To achieve the Narrow NSP targets by 2011, increased resources will be required in the next few years. Even though the other two scenarios involve cuts in some programme areas (Hard Choices) and a slower rate of build-up of coverage (Expanded NSP), both will also require a significant



expansion in HIV/AIDS spending by the government, its external partners, civil society and the private sector in South Africa. There are no financial short cuts or easy solutions for the country.

Under the prevention activities, the Expanded NSP is the most expensive (Figure 12), because it has the widest range of interventions with high targets that also attempt to address the underlying causes of vulnerability to HIV infection, such as reducing violence against women. However, the benefits of the Expanded NSP are also greater than under the other scenarios, with almost 3 million cumulative extra infections averted. Narrow NSP and Hard Choices have more similar prevention cost projections, but Hard Choices avoids more infections than the Narrow NSP and therefore is more cost-effective overall in its use of funds for prevention.

**FIGURE 12: Prevention Resource Requirements for all Scenarios, 2009–2031 (ZAR billions)**



In examining the treatment costs (Figure 13), it is important to remember that these include not only ART but also palliative care, OI and TB treatment, HBC, etc. The treatment targets dates differ: 2011 for the Narrow NSP and Hard Choices, and 2015 for Expanded NSP. Also the Expanded NSP includes the *new ART regimen* promoted by WHO in 2010, which had a lower unit cost than the old regimen for the other two scenarios. Thus the Hard Choices and Expanded NSP scenarios have similar treatment costs, because even though the Expanded NSP has greater numbers on ART due to the higher CD4 count threshold for eligibility, its treatment costs are not that much greater than the other two scenarios. Treatment costs for all three scenarios peak around R23–25 billion by 2021.

Over time, as the extensive preventive measures under the Expanded NSP begin to reduce the numbers of new infections, the population in need of ART will also fall and thus treatment costs decline to about R19 million per annum by 2031. While this amount is far greater than is currently being spent by the government on ART and other treatment interventions, it demonstrates how more effective prevention efforts today can pay off in lower treatment spending in the future.

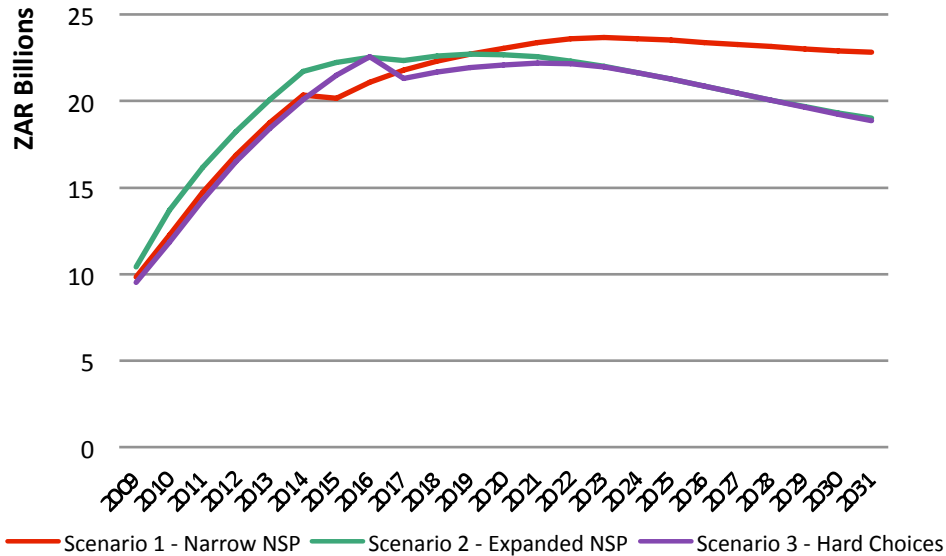
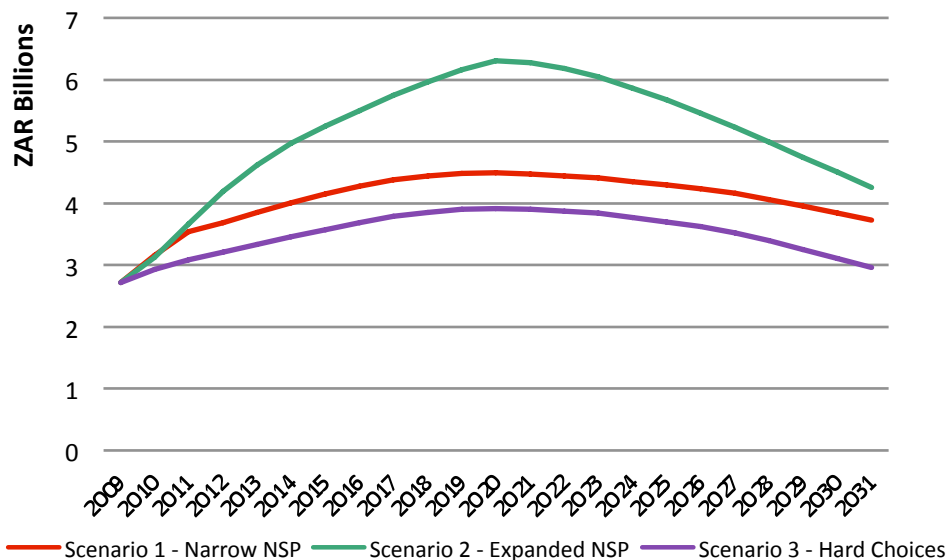
**FIGURE 13: Treatment Resource Requirements for all Scenarios, 2009–2031 (ZAR billions)**

Figure 14 below shows the variation in the mitigation and OVC support costs among the scenarios. Under Hard Choices, mitigation activities are assumed to be cut back due to constrained resources. The Narrow and Expanded NSP scenarios include the Foster Care Grants for HIV-related orphans.

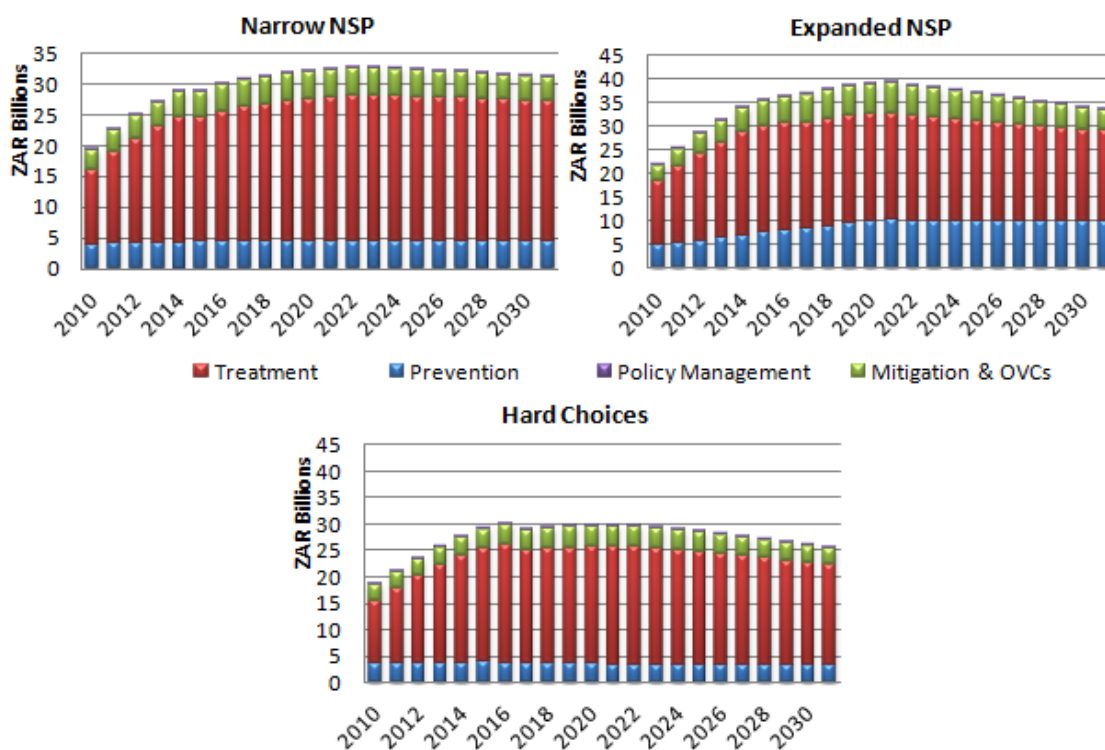
**FIGURE 14: Mitigation & Support Resource Requirements for all Scenarios, 2009–2031 (ZAR billions)**

The Expanded NSP mitigation costs peak at around R6 billion in 2021, and include a comprehensive approach to mitigation, nutritional support and special focus on OVCs. However,

these start to decline after 2021 when the effects of the expanded prevention interventions are felt in reducing adult mortality and the corresponding numbers of AIDS orphans.

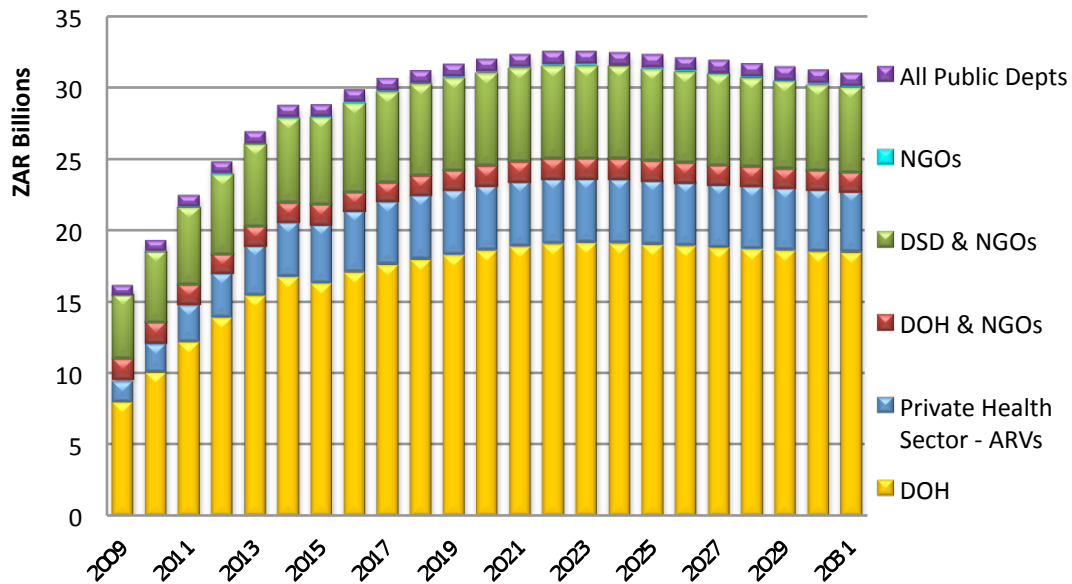
Figure 15 below compares the three scenarios broken down by the priority areas of prevention, treatment, mitigation and policy and management. Treatment costs are the largest component: 71% of the total Narrow NSP costs; 59% of the Expanded NSP; and 74% of the Hard Choices scenario. However, with the new ART tender currently being negotiated by the national Department of Health, these figures could come down. Each of these priority areas is disaggregated in greater detail below, to ascertain the drivers in each category. Refer also to Appendices I to K which provide detailed figures for each intervention.

**FIGURE 15: Resource requirements by priority area for each scenario, 2010-2031 (ZAR billions)**

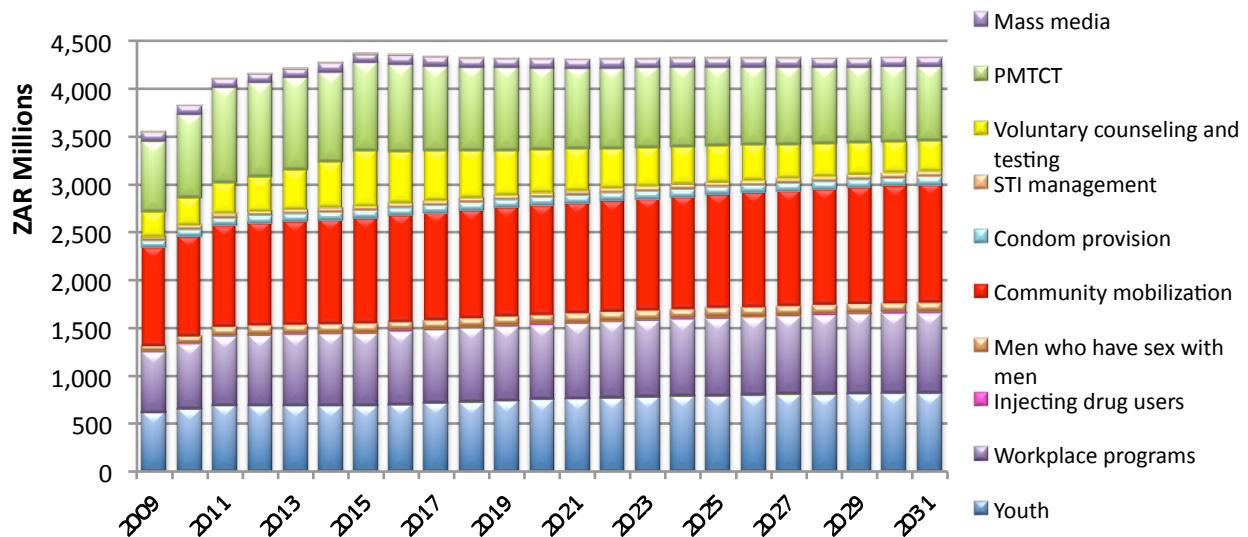


**4.2 Scenario 1—Narrow NSP Interventions to 2011**

The Narrow NSP scenario, with targets achieved by 2011, requires initial steep increases in spending between the years 2009 and 2011, as would be expected to achieve the ambitious targets by the short deadlines. It is not clear whether these targets will be achieved, but it appears that some will come close while others may lag behind. The mid-term review of the NSP will provide valuable insight into progress that will direct the efforts in the last few years of the NSP period. Refer to Appendix I for all interventions of the Narrow NSP shown together. These are presented first by the public departments and other service providers, and then by intervention.

**FIGURE 16: Narrow NSP Spending by Public Departments and Other Sectors (ZAR billions)**

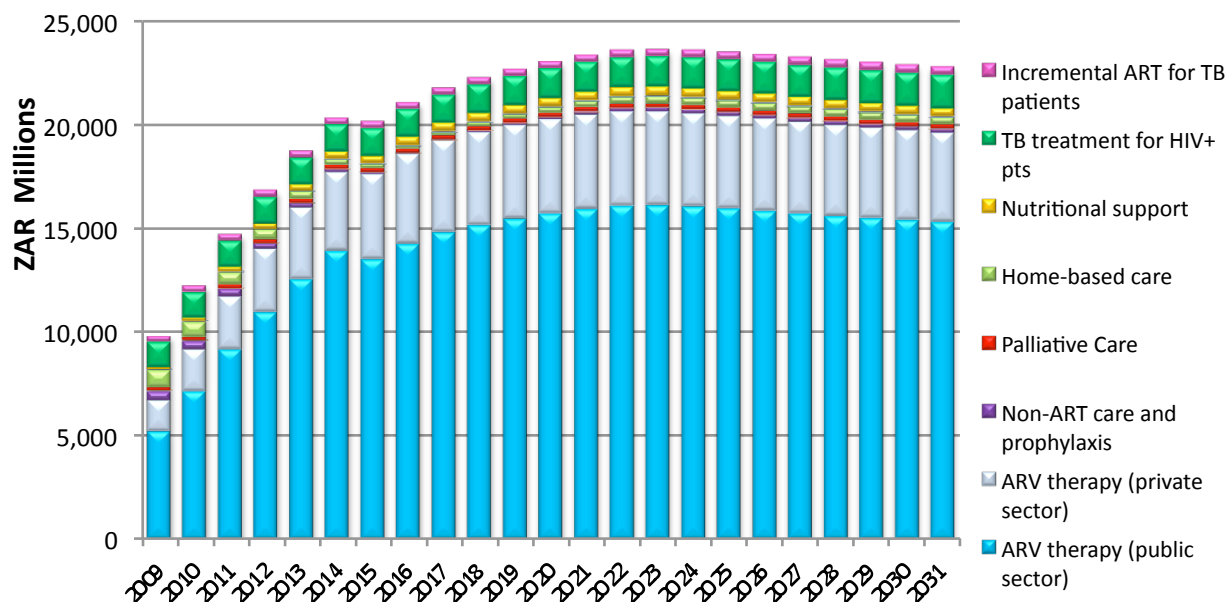
As the above figure indicates, the bulk of the provision of the HIV/AIDS services under the Narrow NSP will be the responsibility of the DOH, reaching just over R15 billion by 2015 and increasing to just under R20 billion by 2021. The private sector contribution to ART will also be an important component of the overall response. NGOs and the DOH will provide home based care, while NGOs and DSD will provide orphan care, although this distinction is not so clear in practice. The wellness workplace programmes will be delivered by all the departments, and should also form part of the business sectors' responsibility.

**FIGURE 17: Narrow NSP Prevention Resource Requirements, 2007–2031 (ZAR millions)**

Under prevention, the interventions with the greatest costs are: youth, workplace programmes, community mobilisation and PMTCT, while VCT follows, with condoms forming a small component. The remaining interventions, including CSW, MSM and IDU programmes, and STI management require much smaller resources. Note that male circumcision was not included in this scenario.

The treatment components for the Narrow NSP are shown in the figure below.

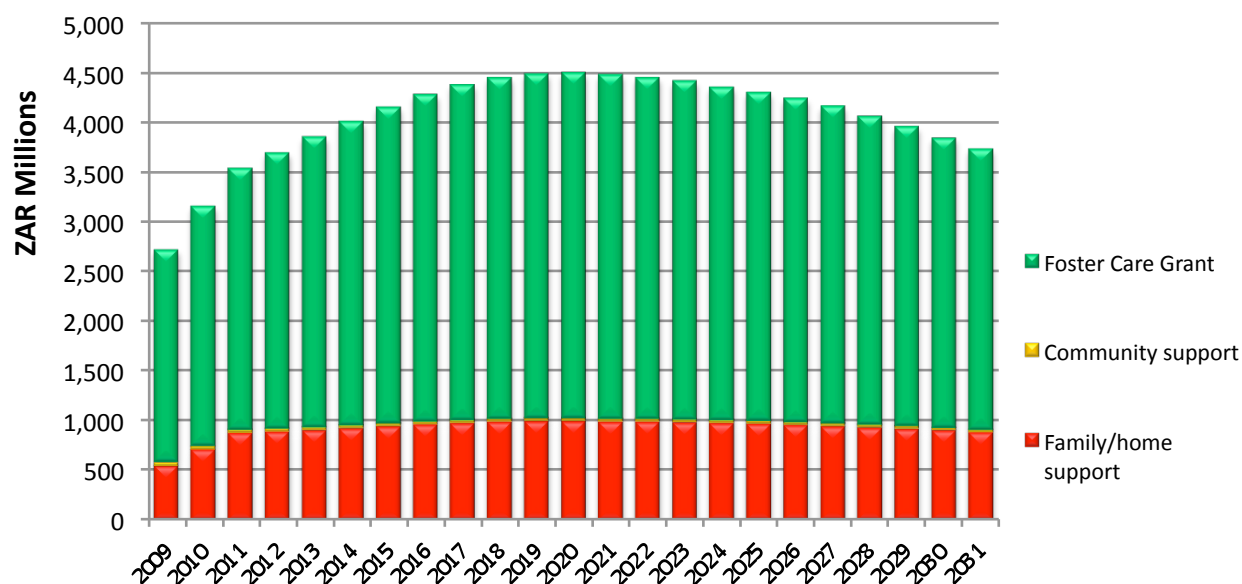
**FIGURE 18: Narrow NSP Treatment Resource Requirements, 2009–2031 (ZAR billions)**



\* NB, the slight reduction in costs around 2016/7 is due to the small variation between the ASSA and Spectrum numbers of ART patients which was minimised as far as possible.

As expected, the treatment costs are dominated by the ARV requirements, with over 80% of the total, primarily in the public sector where about 90% of patients access their treatment. This underscores the importance of the government negotiating reduced prices for ARVs and of the private sector increasing its treatment coverage, also at lower unit prices. TB treatment is a significant contributor to total treatment costs, amounting to over 5% of the total, given the high rate of HIV-TB co-infection in South Africa and the increasing incidence of multi-drug resistant (MDR) TB which is more expensive to treat. Nutritional support is an important intervention for the large numbers of patients living in poverty in South Africa, yet forms a very small component of the total costs, primarily because of the low current and target coverage rates for this scenario. Home-based care costs are also low, as the many NGOs undertake this activity at a modest unit cost.

Figure 19 shows the mitigation and OVC support costs under the Narrow NSP.

**FIGURE 19: Narrow NSP Mitigation & Support Resource Requirements, 2009–2031 (ZAR millions)**

The mitigation and OVC support costs rise rapidly in the early years of the Narrow NSP so as to achieve the 2011 targets. The bulk of these costs are due to the Foster Care Grant (FCG) that the government provides to children in need of foster care. In these estimations it was assumed that approximately 56% of the total spending on these grants was for HIV-related orphans.

The above figures are expressed in detail in the tables in Appendix G.

### 4.3 Scenario 2—Expanded NSP to 2021

Under the Expanded NSP scenario, the DOH is the main service provider, along with DSD and NGOs, as the figure below indicates.

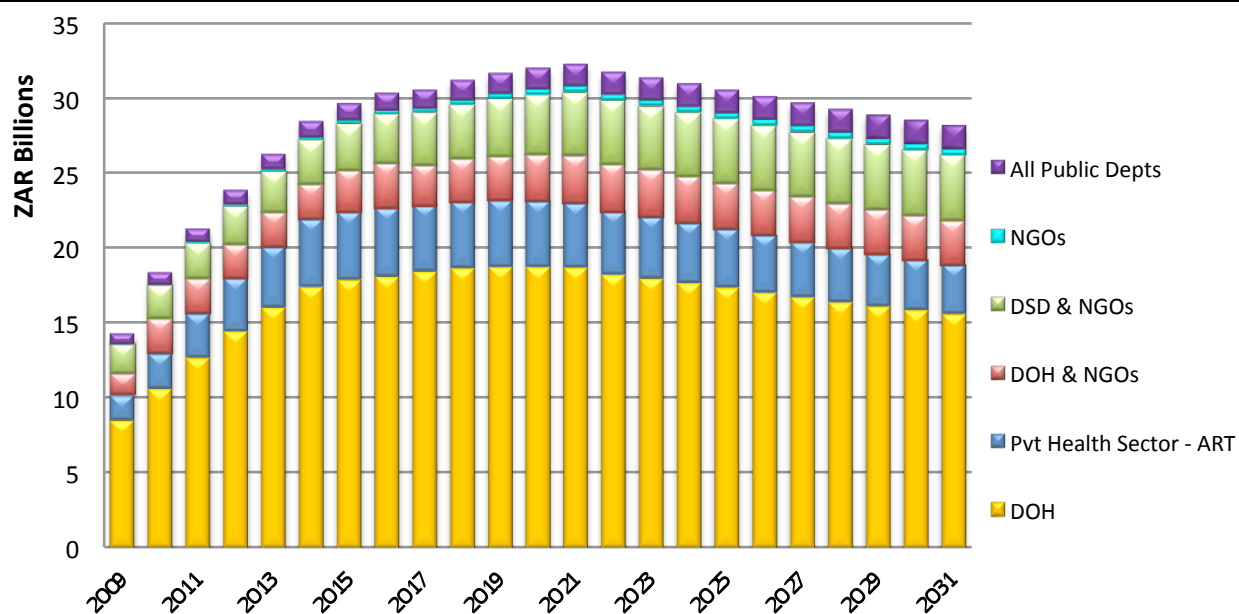
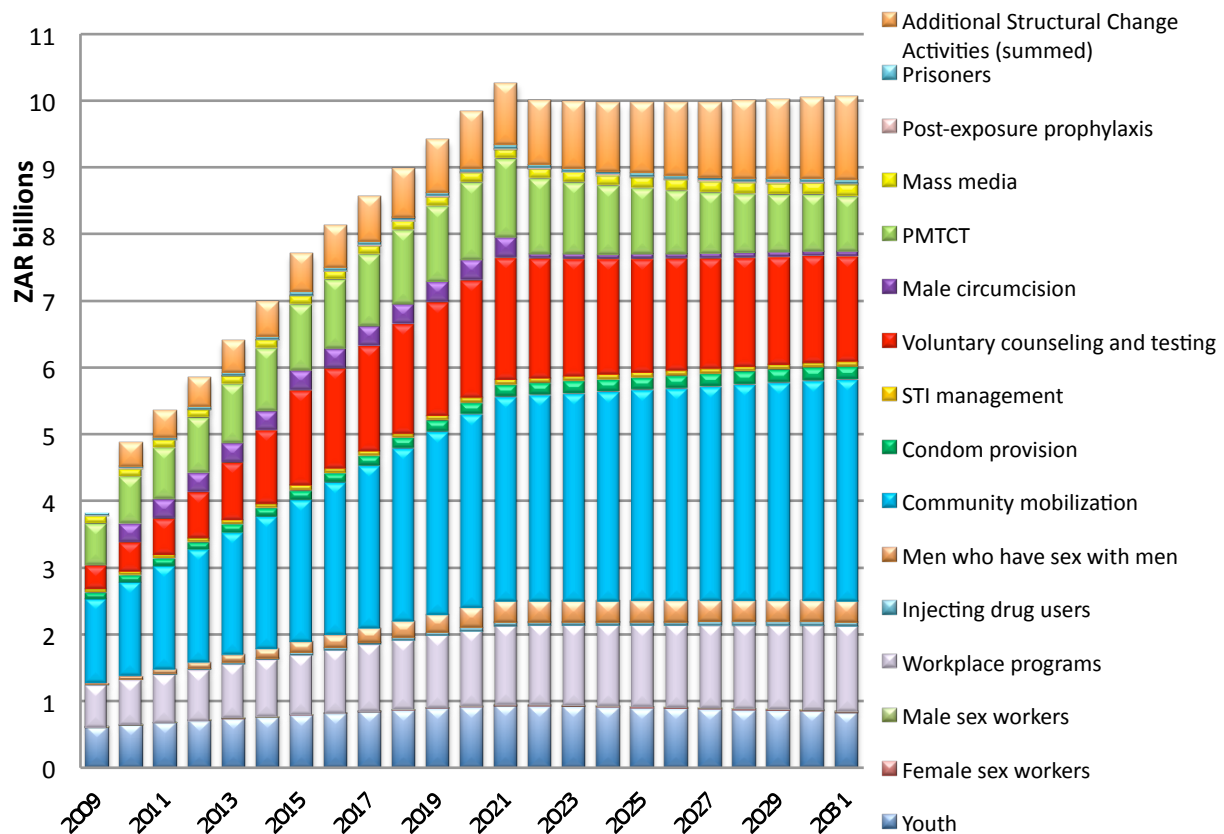
**FIGURE 20: Expanded NSP Spending by Public Departments & Other Sectors, 2007–2031 (ZAR billions)**

Figure 21 below shows balance in needed resources across a variety of prevention interventions, with the additional efforts to reduce vulnerability to infection through, for instance, programmes against gender violence. Workplace programmes, community mobilisation and VCT require the largest shares, while male circumcision absorbs relatively little funding, in part due to the 35% of South African men (WHO estimate) who are already traditionally circumcised and the low unit cost per adult male. Also once the target coverage rate of 90% is reached in 2015, fewer resources are required to circumcise the neonate babies and young men reaching the age of traditional circumcision. Prevention costs for IDUs and CSWs are also limited, due to their small population sizes. PMTCT takes an initially growing share but then falls as the effect of the other prevention efforts are felt in lowering new infections in pregnant women.

In comparison to the Narrow NSP scenario, the Expanded NSP has greater impact on the new HIV infection rate primarily due to male circumcision and expansion of the ART programme. In addition, the expansion of other prevention interventions such as community mobilisation, MSM programmes and extra efforts to reduce vulnerability also contributes to the decline in incidence.

**FIGURE 21: Expanded NSP Prevention Resource Requirements, 2009–2031 (ZAR billions)**

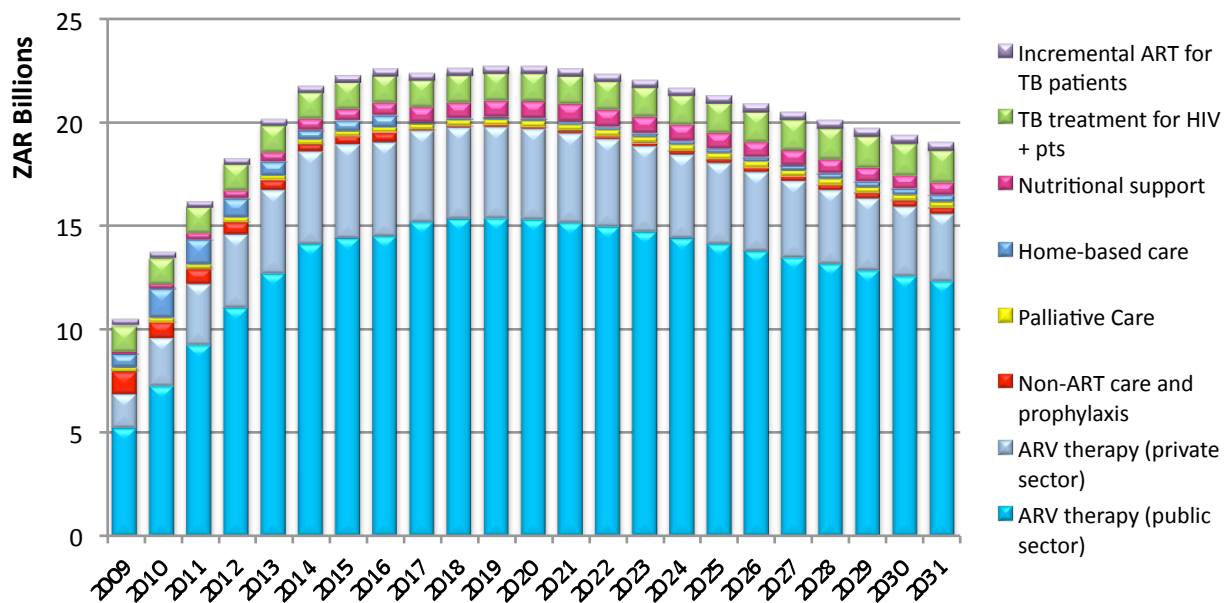


The treatment components of the Expanded NSP are presented below, with the new ART regimen and the higher CD4 eligibility thresholds. Again, the ARV costs dominate the treatment resource requirements. Nutritional support costs are a relatively small component, even though they are a

critical part of treatment, since many South Africans on government-funded treatment live in poverty and thus might compromise adherence to the treatment program without food support. Note also the falling costs of non-ART care and prophylaxis, as the ART programme reaches its target level, making an important saving for the DOH, especially for the more 'hidden' in-patient costs.

Since the ART programme will account for a large proportion of total projected AIDS spending, the government should seek ways to reduce the costs of delivering ARTs through cheaper combination, generic medicines, as well as through nurse-initiated treatment, step-down facilities, and other service delivery adjustments. The ART estimates have recently been updated by Meyer-Rather et al (2010), and show possible further reductions in costs.

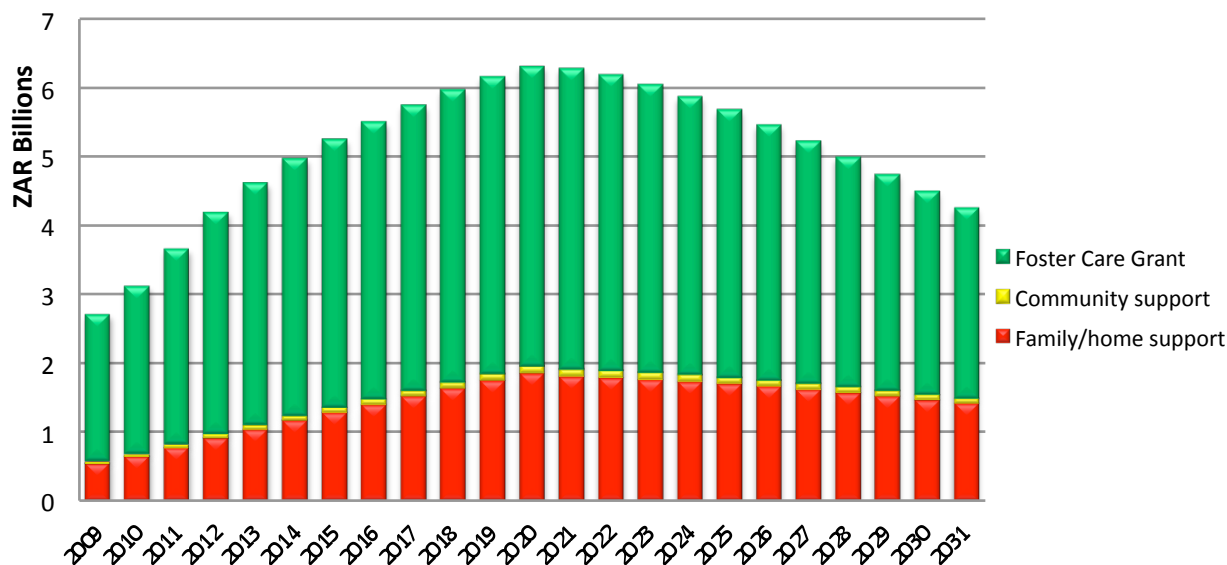
**FIGURE 22: Expanded NSP Treatment Resource Requirements, 2009–2031 (ZAR billions)**



With regard to the mitigation and OVC support costs under the Expanded NSP, Figure 23 below shows that as the number of AIDS orphans and vulnerable children continues to increase in the near future, there will be a growing need for their family and home support. Even though mitigation activities absorb only about 15% of all projected AIDS spending under the Expanded scenario, the year-on-year increase is very steep from about R2.7 billion in 2009 to the peak of R6.3 billion in 2021. Foster Care Grants (FCG) take the largest share of the spending on OVC.



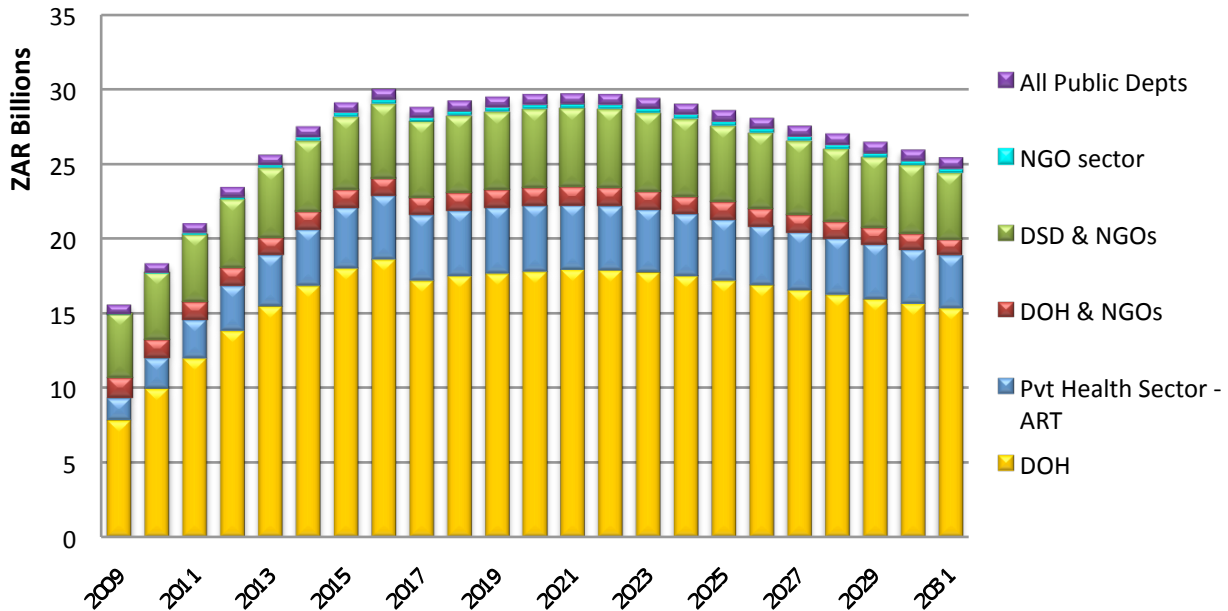
**FIGURE 23: Expanded NSP Mitigation & Support Resource Requirements, 2009–2031 (ZAR millions)**



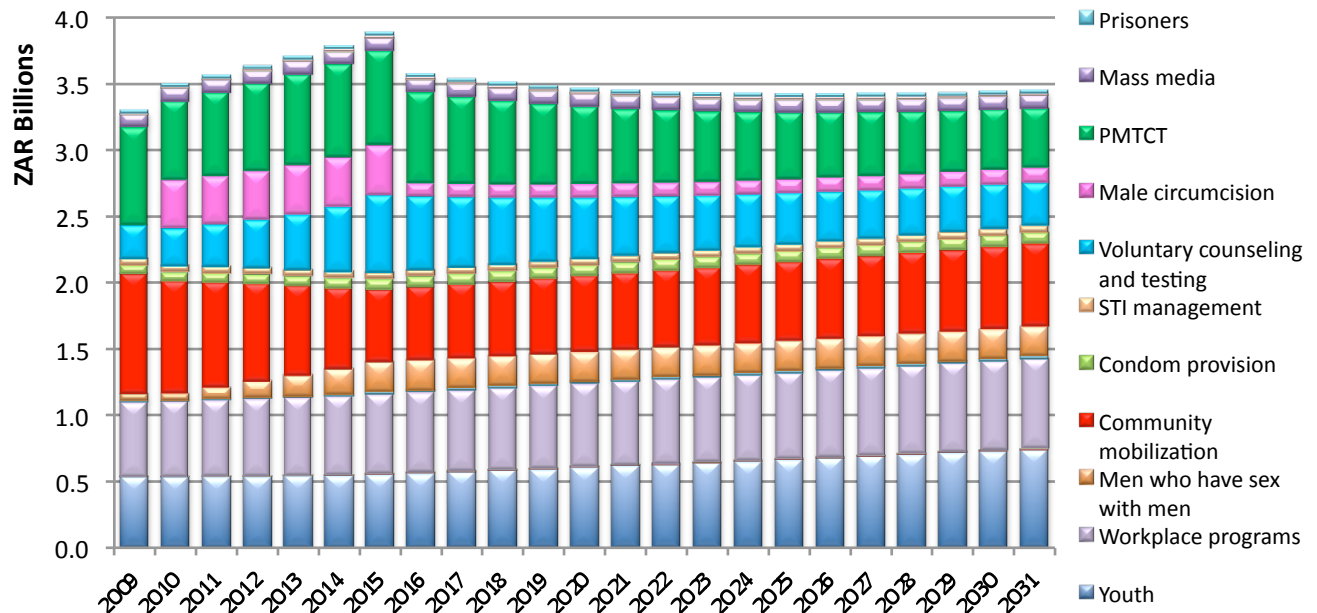
**4.4 Scenario 3—Hard Choices to 2015**

The Hard Choices scenario maintains the same treatment targets as the Narrow NSP and the old, more expensive regimen, while significantly decreasing mitigation activities in 2010, and altering the mix of prevention interventions, putting emphasis on those with proven effectiveness, such as Youth-in-School, condoms, PMTCT, male circumcision (with more aggressive uptake to 85% by 2015), CSWs and MSM. Under Hard Choices, service levels and costs are cut back in a number of areas including community mobilisation, mass media, youth out-of-school, workplace, HBC and palliative care, thus resulting in a reduction in those costs from 2010 onwards. There are also large reductions in coverage for mitigation programmes, some to levels below those in the Narrow NSP scenario.

The figure below presents the distribution of costs by public and private service providers. Again DOH retains the primary responsibility due to the large component of public ART services. DSD and NGOs also play an important role.

**FIGURE 24: Hard Choices Spending by Public Departments & Other Sectors, 2009–2031 (ZAR billions)**

Only the prevention activities for the Hard Choices are presented below, as the treatment and mitigation components are very similar to the Narrow NSP scenario, as presented already. They are captured with the details of all the interventions in Appendix J.

**FIGURE 25: Hard Choices Prevention Resource Requirements, 2009–2031 (ZAR billions)**

The figure above shows the high priority given to male circumcision in the Hard Choices scenario, which requires significant resources initially to reach 80% coverage by 2015, but thereafter requires only minimal resources to maintain coverage rates by circumcising new neonates and

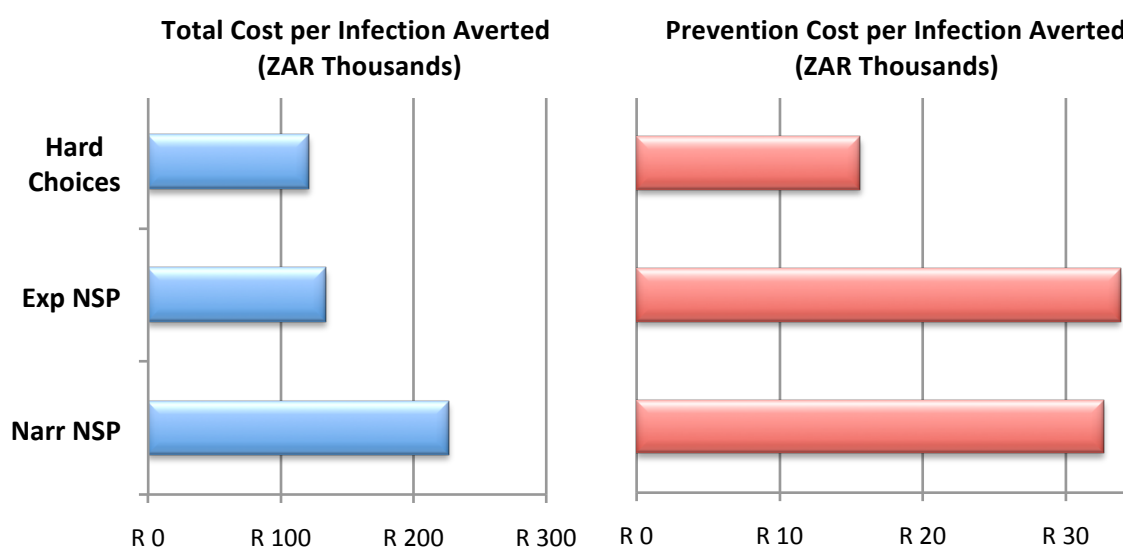
entries into the male adult population. There is some uncertainty regarding the prevalence of male circumcision in South Africa, since many young men undergo traditional circumcision, but this may not be as effective in preventing HIV transmission as medical circumcision.

MSM interventions also gain in priority because they are considered a group at elevated risk of infection and the interventions can be highly effective. However, data on numbers of MSM in South Africa are difficult to obtain, so the target population may be an over- or under-estimation, making the cost projections uncertain.

#### 4.5 Comparison of the Cost-Effectiveness of the Scenarios

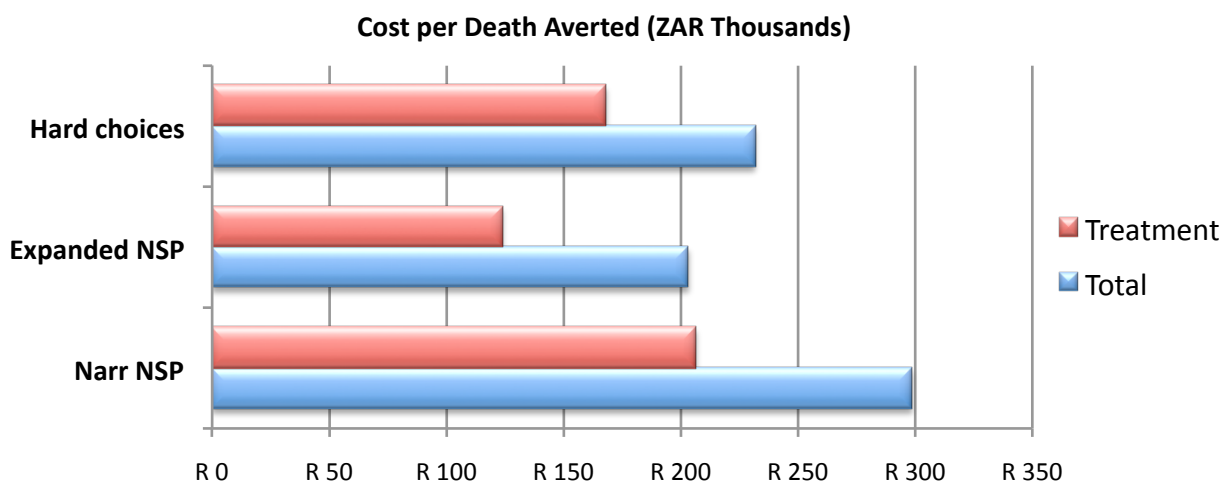
It is important to consider the cost-effectiveness of the three scenarios, to inform wise decisions on the choice of spending scenario by the government. The Expanded NSP scenario is more costly than the other two scenarios, but has a larger impact on the epidemic, lowering the number of new infections much further than Narrow NSP and Hard Choices. Hard Choices is the cheapest scenario and results in fewer infections than the Narrow NSP, highlighting the fact that the government can obtain greater value for money by spending “smart” on the prevention services that are more effective. The following figures show the cost-effectiveness of each scenario, over the entire period, regarding infections and deaths averted.

**FIGURE 26: Cost of Infections Averted—Total Costs and Prevention Costs**



Using total costs, the Expanded NSP and Hard Choices have similar costs per infection averted, showing that Hard Choices is the most cost-effective overall, primarily because those activities (including mitigation) which do not have a direct impact on incidence are excluded. Although the Hard Choices most cost-effective, it will not result in the numbers of infections averted required to achieve the NSP targets. To achieve this goal, the Expanded NSP is the best choice.

Considering the cost per death averted (Figure 27), the Expanded NSP is the most cost-effective, using both treatment spending alone or total spending.

**FIGURE 27: Cost of Deaths Averted—Total Costs and Treatment Costs (ZAR thousands)**

## 5. FINANCING FOR HEALTH AND HIV/AIDS IN SOUTH AFRICA

This chapter considers the available funds for health and HIV/AIDS in South Africa—public, external aid and the business sector—using those data that could be obtained within the timeframe of this project. These data are not complete – more work needs to be done to identify the full range of domestic funding sources (including discretionary spending by the provinces) and all of the major external donors and their financial contributions. Nevertheless, the currently available data are presented here in order to highlight certain trends and issues, and to lay the groundwork for additional data collection and analysis that will be need to allow for an accurate estimation of any gap between funding needed and available for HIV/AIDS, and for a consideration of alternative resource mobilization strategies.

### 5.1 Public Revenue Sources

South Africa is a middle income country with a GDP of US\$283 billion in 2007, and per capita GDP of US\$5,775 (Atlas method). Over the last 10 years the government has been able to boost investments and increase local revenue, such that the budget deficit decreased significantly. However, South Africa has also been affected by the global recession, and both imports and exports fell as a share of GDP in 2009. Lings (2009) reported that most sources of tax revenue (especially expenditure taxes) have been behind budget, including VAT, the fuel levy, customs duties, transfer duties and personal income tax. The slowdown in tax revenue, especially expenditure taxes, confirms that economic conditions have deteriorated significantly. Thus National Treasury is facing a significant revenue shortfall, which resulted in the larger than envisaged budget deficit in the 2010/11 budget statement, as much as 11%. In addition, the new Zuma ANC government has taken an approach of increased social spending, such as raising the age for eligibility for the Child Support Grant to 18 years, an important but costly poverty alleviation strategy. Refer to Appendix L for further key economic variables in South Africa.

The increasing demand for ARVs, as well as the increased CD4 eligibility, will also require significant additional funding. It is not clear from where the revenue for these and other public programmes will be sourced, since the South African government appears to have exhausted most of its local revenue options. Other innovative local funding options now need to be considered.

## 5.2 Health Financing in South Africa

Currently, there are four key sources of funding for health care in South Africa:

*Public*—at national, provincial or local level—government allocates to the health sector a portion of the funds it raises from various sources of income, including taxes, licenses and the sale of utilities such as electricity and water.

*Development Partners*—external aid from multi-laterals, bilaterals, Foundations and international NGOs finances certain health services, through various funding mechanisms.

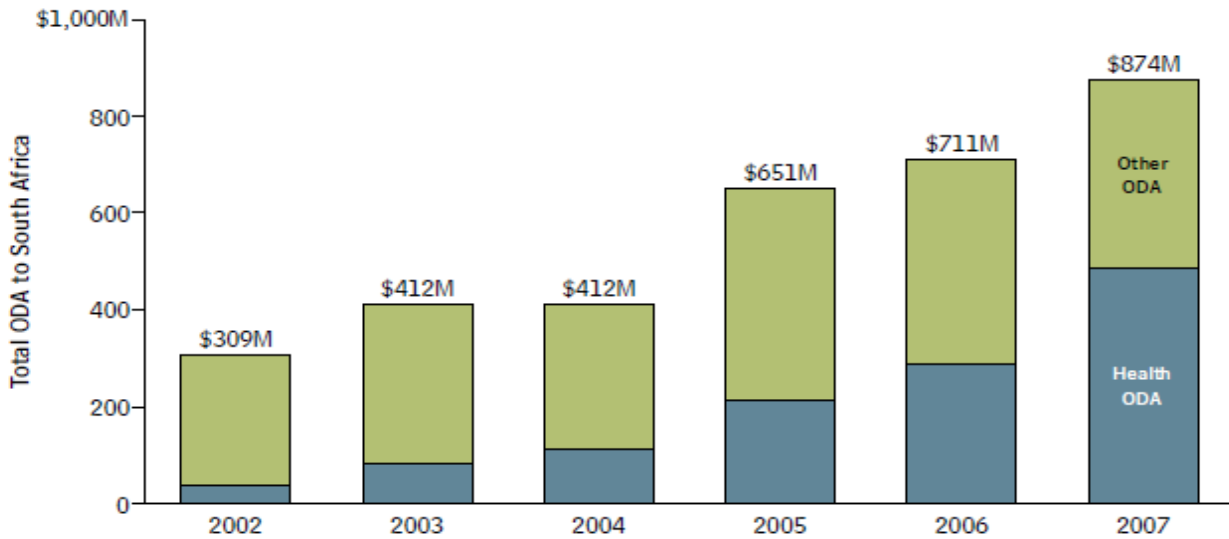
*Employers/business sector* fund health care for their employees, either directly by providing health services at the workplace, or indirectly by contributing to private insurance schemes on behalf of their employees. Businesses also make Corporate Social Investment(CSI) contributions (donations) towards certain health services, which are tax-deductable.

*Households* contribute to private insurance schemes or pay directly for health care services, known as out-of-pocket expenditures (OOPE). According to the ASSA estimates, only 10% of the population access private health care services, while 90% utilise the public services.

There is limited data available on the external aid, the business sector's contribution and the households' OOPE for health, and no recent National Health Account (NHA) has been conducted to provide these data. However public allocations are available from the National Budget, and expenditure against these is reported quarterly online. Below we present the available data on Overseas Development Aid (ODA), the business sector and then the public national and provincial (consolidated) health budget allocations, historically and projected in the Medium Term Expenditure Framework (MTEF).

## 5.3 Overseas Development Aid (ODA) for Health in South Africa

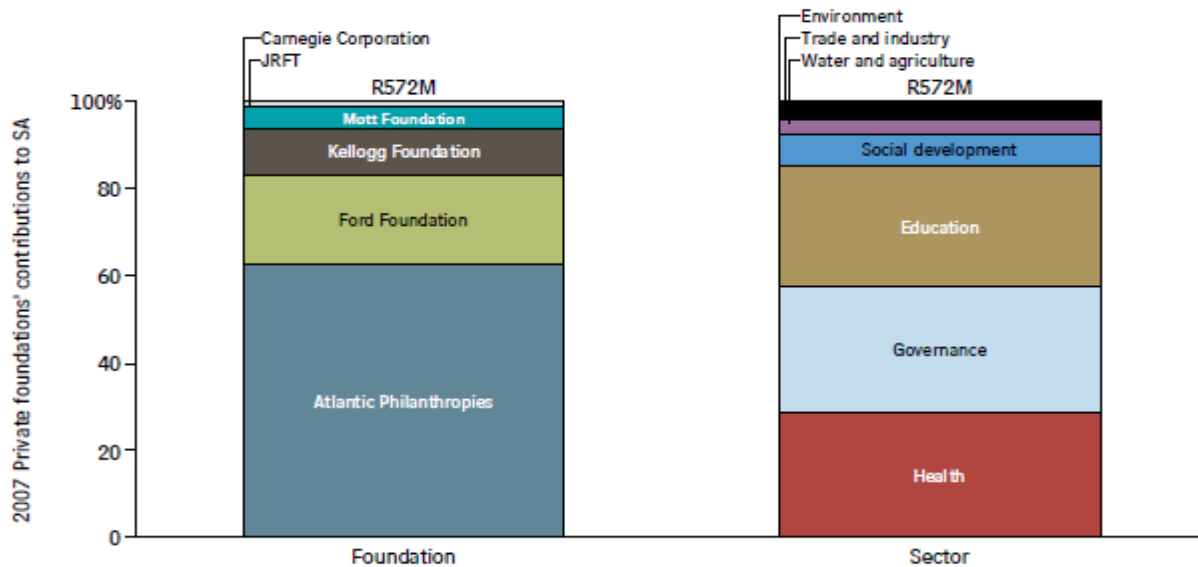
According to the Burlington report (2009), the total development funding for South Africa amounted to R24 billion, of which R7 billion (29%) went towards health care. These amounts included the National Treasury transfers to non-profit institutions. The HIV/AIDS component was not specified in the Burlington report, but data provided by the Global Fund and PEPFAR would suggest that a large share of development assistance for health in South Africa is in fact earmarked for HIV/AIDS.

**FIGURE 28: Health Care as a Proportion of Total Development Aid in South Africa, 2002–2007**

*Copied with permission from Burlington (2009).*

Sources: OECD (2007 disbursed ODA), Triologue 2007, Annual reports of Private Foundations, Treasury expenditure reports (2008), PEPFAR 2007 Country Operation Plan.

The Burlington report (2009) found that the 10 largest foundations contributing to development in South Africa were Atlantic Philanthropies, Ford, Kellogg and Mott Foundations. Approximately one third of these contributions went to health. However, they were unable to access the spending of the Gates Foundation and the Open Society Institute, both of which are large contributors to health and HIV/AIDS activities in South Africa.

**FIGURE 29: Large Foundations Contributions to Development in South Africa, 2007**

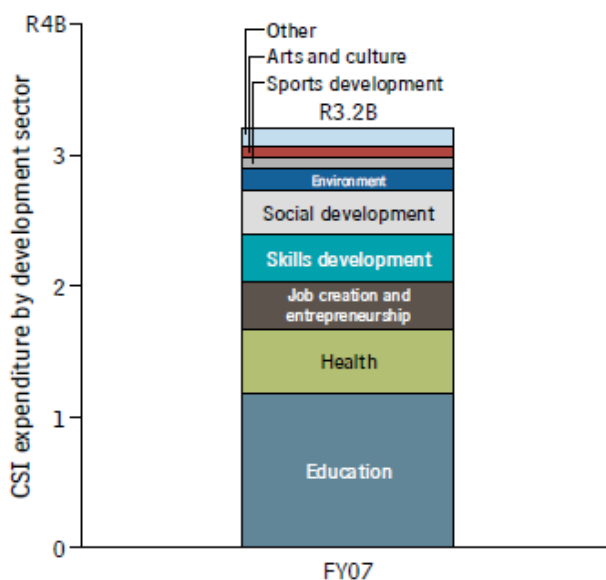
*Copied with permission from Burlington (2009).*

Sources: Foundation websites, Foundation Centre (International grant making highlights IV).

#### 5.4 Business Sector Contributions to Health in South Africa

In South Africa, the business sector is encouraged to make contributions to development activities, which are tax deductible and are referred to as Corporate Social Investments (CSI). According to the Trialogue database, reported in the Burlington Report (2009), total CSI amounted to R3.2 billion in 2007, the majority of which came from mining, construction, state-owned enterprises and the financial sector, and was allocated as shown in the figure below. Unfortunately the proportion made to HIV/AIDS could not be obtained at the time of writing.

**FIGURE 30: Business Sector Contributions to Development in South Africa, 2007**



*Copied with permission from Burlington (2009).*

Sources: Trialogue CSI database, 2007.

#### 5.5 Public Allocations for Health in South Africa

Ndlovu (2009) reports that the consolidated (provincial and national) health budget almost doubled from R57.3 billion in 2005/6 to R111 billion in 2009/10. This equates to approximately US\$300 per capita per annum health spending. The health budget is expected to further increase to R120 billion in 2011/12. Between 2005/06 and 2011/12 the major areas of growth are in the HIV/AIDS and STIs sub-programme (in the Strategic Health Programmes), which has grown by R2.7 billion in real terms, and the Hospitals and Health Facilities Management sub-programme (in the Health Services Programme and which contains the Hospital Revitalisation Grant) (NT, Estimates of National Expenditure, 2009:277). Of concern is the relatively small increase going to District Health Systems which would allow for the decentralization of the ART delivery in clinics.

#### 5.6 Public Funding for HIV/AIDS in South Africa

In South Africa, there are three funding streams for HIV/AIDS services within the public social sectors. The first are *conditional grants* (CG), transfers from national department to provinces

that are ring-fenced for specific programmes, as the NDOH provides guidelines on how these are to be spent. The second are also transfers from national to provincial departments, known as the *equitable share* (ES), which provinces can spend according to their discretion and priorities. The equitable share formula divides national revenue between the provinces based on need, previous disadvantage and degree of underdevelopment. The third source is from provincial own revenue, from taxes, levies, etc. These funds can also be spent at the province's discretion, but unfortunately data on this expenditure are not as easily accessible as the CG allocations. The forthcoming NASA will correct this gap in the data. In addition, there were recent moves away from the CG towards more ES funding, so that HIV/AIDS programmes can be fully integrated into existing provincial services (the South African Treasury estimates that ES funds for HIV/AIDS, including for treatment of opportunistic infections, may be around R5-6 billion in 2010). However, with the rising demand for ARTs, it appears that the CG for the DOH will not be removed in the near future. In addition, the Department of Education gets a conditional grant for AIDS life-skills training in schools. There are additional significant allocations for the school nutrition programme which benefit children orphaned or made vulnerable by HIV/AIDS.

Other departments outside the social sector, such as Correctional Services, Defense, and Public Service and Administration, spend some HIV/AIDS funds on their Employee Wellness Programmes from the equitable share allocations. Unfortunately these resources cannot be easily distinguished in the departmental budgets.

Total social sector HIV/AIDS-specific allocations have increased in nominal terms from R2.4 billion in 2005/6 to R11 billion in 2010/11, with further anticipated annual average increases of 18% over the MTEF period, particularly in the health sector, showing that the government has budgeted resources well above estimated inflation levels. Nevertheless it will be challenging for government budget outlays for HIV/AIDS to keep pace with the growing needs for prevention, treatment, and mitigation activities

From the budget allocations, particularly for the CG, is it clear that the DOH plays the dominant role in the delivery of the government's HIV/AIDS activities: DOH has a nominal allocation of almost R24 billion for HIV/AIDS for the three year MTEF period, accounting for 60% of the total integrated HIV/AIDS allocations for the social sectors. In addition to these clear allocations, there are other DOH outlays that are more difficult to distinguish in providing in-patient care for OIs, TB treatment, and out-patient care. We estimate the later at around R5 billion a year<sup>5</sup>.

Also importantly, approximately 20% of the total health HIV/AIDS allocations over the MTEF period are projected to come from provincial health departments' own discretionary budgets, with KwaZulu-Natal and Gauteng progressively supplementing the national CGs with their own funds. However, provincial discretionary allocations are not growing as fast as the CGs. This possibly emanates from the fact that provincial treasuries and departments may decide to allocate equitable share resources to other areas that are underfunded or to programmes of provincial

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<sup>5</sup> Blecher, M. 2010. Personal communiqué.



priority, i.e. programmes not already funded through the CG. An assessment of all national and provincial spending on HIV/AIDS will ascertain more accurately how provinces are spending their ES (voted) funds.

The education sector is allocated R600 million for the 2010/11–2012/13 MTEF period through the HIV and AIDS lifeskills CG. The social development HIV/AIDS CG came to an end in 2005/6, and provinces were expected to source HIV/AIDS funds for community home-based care (CHBC) and support activities from the provincial equitable share. Recent budgets indicate that provinces prioritized social development HIV/AIDS interventions in their budgets and allocated financial resources progressively, building on the trends set by the conditional grant funding system. The total provincial social development discretionary allocations for HIV/AIDS have increased from R237 million in 2006/7 to R669 million in 2010/11, a real annual average rate of increase of 23 per cent.<sup>6</sup> The social development sector has allocated R2.2 billion for the 2010/11–2012/13 MTEF from its equitable share, which represents 5 per cent of the social sector integrated HIV/AIDS budgets. With the phasing out of the CG, the provinces have been proactive to preserve the CHBC funds in their equitable share budgets.

### **5.7 External Aid for HIV/AIDS in South Africa**

Due to the fact that the Donor Mapping being undertaken with support from the EU Donors Group was not ready at the time of writing, and the National AIDS Spending Assessment is still to be conducted, the available literature on donor funds for HIV/AIDS in South Africa was scant. The provincial DOH maintain a list of their past and current donors for health, but these cover funding cycles, rather than specific years, and do not provide future commitments. Unfortunately there was no national DOH list to access. Other sources of information are the OECD database, the PEPFAR Country Operational Plan, which indicates commitments that may or may not lead to actual spending, a recent analysis by Burlington (2009), and the Trialogue database of all Social Corporate Investment in South Africa.

While the exact amount is not known, the South African Treasury estimates that total external financing for HIV/AIDS amounts to R5-6 billion per annum. Among the external funders of the South Africa national HIV/AIDS program, the Global Fund for HIV/AIDS, TB and Malaria (GFATM) and PEPFAR have been important contributors in recent years. PEPFAR's support has risen substantially from \$106 million in 2005 to \$591 million in 2008. The U.S. government has also announced supplemental funding of \$210 million for AIDS treatment during 2009–10. At the same time, there are reports that PEPFAR will be reducing its commitments to South Africa in the coming years, at a time when projected spending is rising rapidly.

### **5.8 HIV/AIDS Funding Challenge**

Although the South African government has significantly increased public allocations for HIV/AIDS in the health, education and social development sectors since 2006/07, it can be seen

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<sup>6</sup> Provincial Budget Statements, 2009/10.

that there will be major challenge in meeting total funding needs in the future, if the country is going to pursue the Expanded NSP scenario as the option to achieve substantial reductions in new infections, HIV prevalence, and AIDS mortality in South Africa.

Given that the potential for a mismatch between funding required for HIV/AIDS and resources available, especially over the next 5-10 years, the government of South Africa may wish to outline several resource mobilization options that it can pursue. With the challenges it is likely to face, the government could consider a range of funding sources, including longer-term commitments from external partners and the business sector, as well as exploring other innovative financing mechanisms such as earmarked “solidarity” taxes and voluntary contributions. The government could also organize a series of resource mobilization meetings with its domestic and external partners, in order to highlight the funding challenges and to build consensus and commitment around a preferred set of resource mobilization actions.

## 6. SUMMARY AND POLICY OPTIONS

### 6.1 Summary

#### 6.1.1 Methodology

This project attempted to estimate the influence of several factors on the magnitude, nature, costs, and impacts of the national response to HIV/AIDS in South Africa. These include the level of political will, resources available, rate of behavioural change, as well as the implementation capacity within the country. In addition, it merges five key methodological approaches:

- Extensive review of available South African unit costs (which resulted in a useful database for easy access for future HIV/AIDS cost estimation, budgeting, etc.);
- National costing using the Resource Needs Model, adapted to South African assumptions as expressed by the Steering Committee, and to local data on unit costs and coverage rates;
- ART costs as estimated by Meyer-Rath *et al* (2009) for the NDOH;
- Epidemiological modelling using Spectrum, calibrated to the South African ASSA estimates;
- Effectiveness analysis using the GOALS model, combined with Spectrum to allow the selected interventions to influence the epidemiological outcomes, based on the Impact Matrix which utilizes the findings of many effectiveness studies for the key interventions.

This process proved labour intensive, but produced some useful findings, bearing in mind the large uncertainties that exist with any projections over such a long period.

### 6.1.2 Scenarios

The scenarios agreed upon by the Steering Committee provide three possible pictures of future AIDS programme scale up for South Africa, which in turn generate epidemiological and resource requirement (cost) results, based on assumed coverage rates and unit costs.

The three scenarios selected represent a range of policy choices: a minimum package (Hard Choices); a middle package (Narrow NSP); and a maximum package (Expanded NSP).

*Scenario 1: Narrow NSP Interventions to 2011*—This scenario reflects the current South African interventions reaching the NSP targets by 2011, and excludes male circumcision. ART is based on the old WHO treatment regimen and the CD4 count eligibility criteria of 200 cells/ $\mu\text{m}^3$ .

*Scenario 2: Expanded NSP to 2021*—This scenario takes a wide ranging, comprehensive approach including all the NSP goals and others including male circumcision, measure to reduce violence against women and empower commercial sex workers, and some poverty alleviating interventions. The scenario also assumes achievement of targets by 2021, except for the new ARV targets which are reached by 2015, according to the new treatment regimen and the increased CD4 eligibility threshold adopted by the government in December 2009.

*Scenario 3: Hard Choice to 2015*—This scenario assumes that difficult choices have to be made between interventions due to highly constrained resources, and there is a focus on the most cost-effective prevention interventions. The treatment interventions remain the same as for Current NSP scenario. The social mitigation and OVC interventions are substantially curtailed in this scenario.

### 6.1.3 Epidemiological Impact

The epidemiological projections from *aids2031* reinforce the view that the HIV/AIDS epidemic is deeply entrenched in South Africa, having already reached levels that make a complete reversal extremely difficult, if not impossible, in the coming years. This is a result of the widespread infections that have already occurred in South Africa over the past decade, which will inevitably require large scale treatment costs in the future.

In the absence of “game-changing” new technology such as a vaccine to prevent HIV transmission or a drug that completely eliminates the virus from the body, large numbers of new HIV-infections will continue to occur in South Africa in the near and possibly medium term future. Even under the most optimistic of the modelled scenarios, the Expanded NSP package, about 5 million more South Africans will become infected with HIV over the next two decades—roughly the number who are currently living with the virus. Still, new infections under the Expanded NSP are estimated to fall to 180,000 annually by 2020—thus achieving the NSP goal of cutting incidence by more than 50%—and to prevent a total of 5.7 million infections by 2031, as compared to the baseline situation. Adult (15+) HIV prevalence would also fall from its current 17% to around 10%.

With the Narrow NSP and Hard Choices scenarios, the prevalence rate is estimated to decline to around 15% and 11%, respectively, by 2031. Another 7.5 million South Africans would become infected over the 20 year period under the Narrow NSP, which would fail to reach the NSP goal of a 50% reduction in annual infections. The same is true for the Hard Choices, even though it would do somewhat better than Narrow NSP in prevention, avoiding almost 2 million more infections than the Narrow NSP over the two decades.

In all scenarios, the commitment to expanding PMTCT and paediatric ART would successfully avert around 15,000 infant HIV-related deaths per year or 300,000 infant deaths over the two decades, assuming that the ambitious NSP targets are achieved in 2011. Since the PMTCT and paediatric ART approaches are already well established in South Africa, the challenge for the country will be to ensure adequate political commitment and increased health system capacity to expand PMTCT services to reach 95% of pregnant women in the country.

In order to cut the number of new HIV infections further, there needs to be massive focus on a major behavioural revolution to stop new infections in “low risk” heterosexual adults. This can only happen if adults have fewer concurrent partners and use condoms regularly where those multiple partnerships continue.

#### 6.1.4 Estimated Costs of the Scenarios

Each scenario was costed using the RNM, by multiplying the population in need of each intervention by the target coverage rate and the unit cost for each intervention. Assumptions were applied for each intervention, including the unit costs and current coverage rates which were, as far as possible, based on the most up-to-date, available South African data. These cost estimates refer to the entire response in South Africa by all actors including NGOs, businesses and external development partners, and thus the projected costs should not be seen as a responsibility of the public sector, especially the national and provincial departments of health. The ART costs were estimated by Meyer-Rather *et al* (2009).

Under all three scenarios, costs rise rapidly over the next few years, growing from around R16 billion in 2009 to R29-35 billion (US\$3.8-4.7 billion) by 2015/16. This twofold increase in required resources will put considerable pressure on the government and the South African economy. The programme cuts under Hard Choices save some funds during this period, as does the slower build-up of services under the Expanded NSP scenario, but these savings are small. This is because the majority of costs (59-74%) come from AIDS treatment efforts which expand quickly, to cover three million infected South Africans, as compared to a million on treatment today.

Over the entire period the costs of the Expanded NSP rise to about R39 billion in 2021 as a result of wider treatment coverage, prevention efforts and investments in programmes to reduce vulnerability and to address the social consequences of AIDS for orphans and affected communities. Thereafter the Expanded NSP costs gradually decline. Total costs over the two decades are estimated at R658 billion (US\$88 billion) for the Narrow NSP, R598 billion (US\$80 billion) for Hard Choices, and R765 billion (US\$101 billion) for the Expanded NSP.

Since the Expanded NSP has a larger impact on new HIV infections than the other two scenarios, its higher cost is more than outweighed by the prevention benefits it generates. Using a similar type of analysis, the Hard Choices scenario can be seen to avoid an additional 100,000 new HIV infections annually as compared to the Narrow NSP. Overall the Expanded NSP is the most cost-effective in averting deaths over the long-run.

## **6.2 Policy Options**

In 2003 the South African government committed to its Comprehensive Plan for HIV/AIDS, and in 2007 implemented its NSP for the period 2007–2011. Despite an initial slow roll-out of the free ART programme, the number of people receiving ART has dramatically increased in recent years and South Africa now has the largest free public ART programme in the world. The recent policy decision by the DOH to increase in the CD4 eligibility criteria for ARVs to 350 cells/mm<sup>3</sup> will expand the number of South Africans eligible for treatment, making it challenging and costly for the government to reach its target of treating 80% of those eligible for ART. The recent policy announcement that child support grants will be extended to children up to the age of 18 will greatly assist OVCs, but will also add to spending. Good progress has been made on some of the NSP prevention indicators, while others appear to have lagged behind. The mid-term review of the NSP will provide important information on progress toward the NSP goals and will give stronger direction to all sectors in the next few years. The recent launch of the HIV Counselling and Testing Campaign will hopefully enhance prevention efforts.

Based on the analysis presented in this report, some key emerging policy options that should be considered include the following:

### **6.2.1 Current HIV prevention efforts must be stepped up**

As the modelling in this project shows, stronger prevention will lead to fewer HIV infections and lower spending on ART in the future. Such stepped up prevention needs to proceed along several lines, including widespread implementation of prevention tools that have been rigorously proven to be effective, including male circumcision, prevention of mother-to-child transmission, and condom promotion. The recently launched Counselling and Testing Campaign, expanded provision of condoms and the male circumcision policy will be important in this regard. Extensive awareness raising about the efficacy of male circumcision will be required to ensure that women are not made more powerless in demanding the use of condoms. The existing PMTCT programme needs to be expanded if the NSP goals are to be achieved, and could include ‘opt-out’ testing of all pregnant women. The costs and benefits of school-based education and mass media programmes need to be more carefully studied, to determine their cost-effectiveness.

In addition, there is need for a social “movement” championed by South Africa’s leaders, to promote large-scale behaviour change to reduce the number of multiple and concurrent sexual partners in the general population and increase the use of condoms where such partnerships continue. As this project shows, current prevention approaches will not stop new infections

among low and medium risk individuals, and this is where the great majority of projected new infections will occur in the future under the scenarios we modelled.

Investments in deeper social change programmes (for example, to reduce violence against women, empowerment and legalization of commercial sex workers, and the improvement of living conditions of people in informal settlements) will take time to implement, but over the longer term these could modify the underlying conditions that lead to vulnerability and risk-taking, resulting in greater reductions in new HIV infections.

### **6.2.2 South Africa needs to carefully manage its spending and expansion of ART**

Investment in personnel and infrastructure will be required to expand treatment services, with attention to the adequate salaries and capacity building of professionals, including budgeting and financial management skills for public programme managers. At the same time, given the fact that treatment accounts for about two-thirds of current HIV/AIDS spending in South Africa and will absorb an even greater share in some of the future scenarios modelled, opportunities to reduce the average cost of treating an AIDS patient must be vigorously pursued, so that low cost, high quality ART models can be put in place throughout the country. Efficiencies are possible in many areas, including reduced ARV tender prices with the procurement of generic combinations, rolling out nurse-initiated treatment, and using step-down and community-based approaches that utilise less costly nurses and other auxiliary workers. In addition, continuing attention to the other components of treatment, such as palliative care, home-based care, OI treatment (including TB and MDR TB treatment), and nutritional support are crucial, and should not be forgotten with the increasing ART spending.

### **6.2.3 The government must address the impending HIV/AIDS financing gap**

The analysis carried out for this report points to the large financing demands on South Africa over the next few years as the costs of the HIV/AIDS programme grow from R16 billion a year to as much as 40 billion annually. This will require a strong and effective strategy by the government. Domestic public financing will need to increase, but the scope for doing so may be limited in the short run because of the effects of the global recession on the South African economy. National health insurance might be a source of expanded public funding, and this should be explored as proposals for insurance are reviewed in the coming period.

In addition, external support from sources including PEPFAR, the Global Fund, and others will likely be needed to fill the gaps in domestic funding. Development partners need to align with national priorities and commit more predictable and transparent financing, over longer periods. The business sector in South Africa could also increase their commitments for HIV/AIDS, as well as taking a more proactive role in the provision and delivery of ART and other treatment services for their employees and families.



#### **6.2.4 There is need for stronger HIV/AIDS cost analysis and monitoring**

As this study has shown, there is a paucity of reliable, up to date information on HIV/AIDS costs, service coverage levels, and cost-effectiveness in South Africa, despite the fact that the government is currently spending R16 billion annually to fight to epidemic. There is need for facility- and project-based cost estimates to be done of many of the interventions in South Africa, where unit costs are currently unavailable. An updated unit cost database should be maintained and be easily available, particularly for the public departments to assist with their budgeting processes. Increased cost-effectiveness studies of the various prevention interventions are also needed to inform key policy decisions, so that the most cost-effective approaches are applied. The current levels of coverage for nearly all prevention and treatment services need to be determined, so that the government can know better how well it is progressing toward its targets, and so that the remaining shortfalls and their costs can be accurately determined.

The costing tool used in this project should be maintained and used by the government and other national stakeholders as part of an ongoing effort to assess the financial challenges facing the country as it continues its battle against HIV/AIDS. The tool could also be applied to provincial level programmes and assist with their budgeting and resource mobilisation efforts. When combined with an analysis of actual HIV/AIDS spending (which will hopefully get under way in South Africa soon), the aids2031-South Africa tools could provide a more accurate estimate of the resource gap, which will assist all partners in mobilising and managing their funding on a longer-term basis. The national M&E database needs to include financial indicators which link the inputs with the outputs, and should cover the spending of all actors working in HIV/AIDS in South Africa from the public and private sectors.

### **6.3 Final Remarks**

South Africa plays an important lead role in the Southern Africa region, and therefore the government's commitment to do more to lower the rate of infections, expand treatment, and put in place programmes to cushion the blow of AIDS on individuals, families, and communities, is important in spearheading a regional, as well as national, response. Success will require having informed and vigorous policies on AIDS financing—how much to spend, where and how to spend it efficiently, and how to mobilise the needed funding in a sustained manner.

This report attempts to offer some insights on these financing issues. It suggests that the rise in spending on HIV/AIDS over the next few years will be steep, and even with vigorous efforts, it will be extremely challenging for the country to lower the rate of new infections to achieve the NSP target of a 50% reduction. The government will also face a financing shortfall that will be hard to fill.

Despite this daunting situation, the report also shows that there is cause for hope and optimism. South Africa has many assets at its disposal in tackling the HIV/AIDS financing challenges, if it chooses to deploy them. These assets include its political leaders, its large economy with important growth prospects, and its vibrant civil society and business sectors. South Africa also

has a number of international partners who have expressed their willingness to assist the country's efforts through a period of financial stringency and gaps in domestic funding for the national HIV/AIDS programme.

This year and the next one are a critical time for South Africa in setting its HIV/AIDS policies. As this report demonstrates, if the government makes wise choices concerning HIV prevention, the expansion and management of treatment, and domestic and external financing strategies, the long-run future for the country will be brighter. Informed policy decisions and concerted actions from all partners—government, development partners, business sector and civil society—can have a dramatic effect on the epidemic, its financial costs to South Africa, and the consequences for the health and well being of its people.

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## APPENDIX A: Interventions Included in this Costing using the Resource Needs Model<sup>7</sup>

The Resource Needs Model (RNM)<sup>8</sup> calculates the total resources needed for prevention, care, and orphan and vulnerable children support for HIV/AIDS<sup>3</sup>. Building upon previous work by Kumaranayake and Watts; Swartlander; and Boulle and Cleary; the Resource Needs Model developed by Bollinger, Stover, Boulle and Cleary is being used to project the resources needed to respond to HIV from 2009–2015. A similar framework was also used by Mills *et al.* to estimate the resources associated with the Macro-Commission on Health.

The current RNM model contains three sub-models:

1. The **prevention model**, that calculates the cost of specific prevention interventions and allows the user to specify up to five additional priority populations such as prisoners, migrants, or truck drivers. The specific interventions are:
  - General population
    - Mass media
    - Community mobilisation
  - Priority populations
    - Youth focused interventions
    - Interventions focused on sex workers and their clients
    - Workplace programmes
    - Harm reduction for injecting drug users
    - Interventions focused on men who have sex with men
  - Service delivery
    - Condom provision
    - Improving STI management
    - Voluntary Counselling and Testing
    - Prevention of mother-to-child transmission
  - Health care
    - Post exposure prophylaxis
    - Blood safety<sup>9</sup>
    - Safe injection
    - Universal precautions

<sup>7</sup> Watts, C., Kumaranayake, L., Garcia-Moreno, C. 2009. Financial resources required to achieve universal access to HIV prevention, treatment, care and support. UNAIDS.

<sup>8</sup> Bollinger L., Stover J., Boulle A and Cleary S (2006) Resource Needs for HIV/AIDS: Model for Estimating Resource Needs for Prevention, Care, and Mitigation

<sup>9</sup> Note that for these SA 2031 estimations, the costs of blood safety, safe injections and universal precautions were omitted, based on the Steering Committee's rationale that these are covered automatically by the DOH as general health expenditure.

2. The ***care and treatment model***, which estimates the cost of care and treatment programmes, including:
  - Anti-retroviral therapy (ART), including laboratory tests for monitoring ART and treatment of OIs while on ART
  - Care and prophylaxis in the absence of ART
  - Diagnostic HIV testing
  - Home-based care
  - Palliative care
  - Tuberculosis treatment
  - Nutritional support
  - ART provider training
  
3. The ***mitigation model***, which calculates the cost of interventions to support orphans and vulnerable children (OVC)
  - Educational support
  - Health care support
  - Family/home support
  - Community support
  - Administrative expenses

For each form of intervention, the annual resource estimates by country are estimated by multiplying estimates of:

- the size of the population targeted by the specific intervention;
- the coverage target for the intervention in that year; and
- the unit cost of delivering the intervention in that country.

The final projected expenditure for any specific programme is a combination of these three elements. Country by country, the resource Needs Model (RNM) calculates the total resources needed for prevention, care, and orphan and vulnerable children support for HIV/AIDS on a national level. National level estimates are then aggregated to obtain regional and interventional resource targets.

## APPENDIX B: Assumptions Used in Populating the RNM

DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—PREVENTION INTERVENTIONS		
Indicator	Value (for 2007/08 as far as possible)	Source Notes/Assumption
<b>CSWs</b>		
Numbers of Female CSW in SA	CT = 1,200 (2008). Approx 1:4200.	Gould & Fick, 2008. SWEAT Submission to SALRC. 2009. Therefore in SA = approx. 11,200 estimated. Vandepitte <i>et al</i> , <i>Sex Transm Infec</i> 2006, 82 (suppl III)—SSA range from 0.4%–4.3% of the adult (15–49 year old). However, population surveys from this region (asking about transactional sex—goods/money) yielded even higher proportions.
Annual growth rate in Female SWs	0%	Assuming is a proportion of population which will increase automatically
Annual growth rate in Male SWs	0%	Assuming is a proportion of population which will increase automatically
% sex workers reached by intervention per year	5%	Assumed very low coverage because no public programmes and only very few NGO programmes.
% using condoms among those reached by intervention	50%	RNE default value
% using condoms among those not reached by intervention	30%	RNE default value
% of all condoms that are female condoms	1%	Interview with Eva Marowe, NDOH, 2009. Male condoms = 450mill 2009. Female condoms = 4.5mill. % female of total = 1%
<b>MSM</b>		
Numbers of MSM	GOALS & GRNE default. 2% of adult male POP.	Lane et al, 2009. NB. This was a small sample, respondent-driven (so biased towards MSM known to each other?) Soweto: of sample: Gay = 34.1%, Bi = 30.4%, straight = 31.7%. With regular female = 63.4%. HIV+ = 33.9% of gays. Burrell et al. 2009, Rispel et al. 2009: data collected in Cape Town, Johannesburg, Durban and Gauteng (Soweto) consistently yielded rate of 12.6%–47.2% of men who have sex with men.
Annual growth rate of number of MSM	0%	RNE default value.
Number of sex acts per MSM per year	46	RNE default value. The epi-modelling assumed 2partners per year, and that half of the MSM were also married to women.
% MSM reached by intervention per year	5%	No public MSM programmes in SA, very few NGO services. Assumed this stays constant till 2010.
% using condoms among those reached by intervention	50%	RNE default value. In the epi-modelling, it was assumed that condoms were used in 45% sexual acts.
% using condoms among those not reached by intervention	30%	RNE default value

DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—PREVENTION INTERVENTIONS cont.		
Indicator	Value (for 2007/08 as far as possible)	Source Notes/Assumption
<b>IDUs</b>		
Number of IDUs	At least 250,000 in SA. 1% ad. males.	(PlusNews, June09): <a href="http://www.safaidns.net/?q=node/986">http://www.safaidns.net/?q=node/986</a> HSRC (2005): 4.7% had ever injected drugs in lifetime and 1.6% injected in last 3 mths.
Annual growth rate of number of IDUs	1%	RNE default value.
Number of IDU reached per counsellor	33.3	RNE default value.
Number of sex acts per IDU per year	30	RNE default value.
Number of injections per IDU per year	730	RNE default value.
% of IDUs receiving harm reduction intervention	0%	No public MSM programmes in SA, very few NGO services. Assumed this stay constant till 2010.
% of IDUs receiving Counselling and Testing	0%	
% of IDUs receiving Community Outreach and Peer Education	0%	
% of IDUs receiving Needle and Syringe Exchange	0%	
% of IDUs receiving Drug Substitution	0%	
% of IDU using programme condoms	0%	
<b>Other Vulnerable Pops: PRISONERS</b>		
Current numbers of prisoners	165,000	South Africa's Judicial Inspectorate of Prisons. Quoted in Mail & Guardian, 29 July 2008.
<b>COMMUNITY MOBILISATION</b>		
% reached by intervention per year	30%	HSRC 2008. National HIV Communication Survey.
<b>YOUTH</b>		
Primary school enrollment—net—male	86.0%	UNICEF 2009. Global Education Digest, 2009, figures for 2007. P.94
Primary school enrollment—net—female	86.0%	UNICEF 2009. Global Education Digest. P.94.
Primary pupil-teacher ratio	31.00	UNICEF 2009. Global Education Digest. P.94.
Secondary school enrollment—net—male	71.0%	UNICEF 2009. Global Education Digest. P.113&114.
Secondary school enrollment—net—female	76.0%	UNICEF 2009. Global Education Digest. P.113&114.
Secondary pupil-teacher ratio	29	UNICEF 2009. Global Education Digest. P.124.
Frequency of teacher re-training (years)	3	RNE default value.
Number of tertiary students	741,000	UNICEF 2009. Global Education Digest. P.137
% primary students with teachers trained in AIDS	86	Assuming all teachers are now trained in life-skills. Used UNICEF recent figures. UNICEF 2009. Global Education Digest.
% secondary students with teachers trained in AIDS	74%	Assuming all teachers are now trained in life-skills. Used UNICEF recent figures. UNICEF 2009. Global Education Digest.
% out-of-school youth reached	35%	2005 coverage survey
% tertiary students reached	50%	RNE default value.

DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—PREVENTION INTERVENTIONS cont.		
Indicator	Value (for 2007/08 as far as possible)	Source Notes/Assumption
<b>WORKPLACE/ LABOUR</b>		
Labour force participation rate—male	41%	Census 2006
Labor force participation rate—female	27%	Census 2006
Percent labor force in services & industry	80%	Census 2006
Percent labor force in wage employment in agriculture	10%	Census 2006
Number of formal sector employees	9 583 762 (33.7%)	Census 2006
% workforce receiving peer education	40%	NSP, 2007.
% workforce receiving STI treatment	40%	NSP, 2007.
% workforce receiving condoms	40%	NSP, 2007.
<b>CONDOMS</b>		
15-49 sexually active	62%	South African Demographic Health Survey (SADHS), 2003. HSRC (2005) was slightly higher and used in the GOALS model.
Males 15-49 in regular partnerships	81%	SADHS 2003
15-49 males reporting more than 2 partners. Note no information on non-regular partners	19%	SADHS 2003. Assuming that more than 2 partners implies 'non-regular' but it may not mean this to the respondents—they may have more than 1 regular partner.
Number of sex acts for casual non-regular partners per year	25	RNE default assumption. See HSRC o8 below
Number of sex acts with regular partners per year	66	71% had sex weekly. From Durex Global Sexual Wellbeing survey, 2006. (Safindings, N = 1051). <a href="http://www.durex.com/en-SG/SexualWellbeingSurvey/pages/default.aspx">http://www.durex.com/en-SG/SexualWellbeingSurvey/pages/default.aspx</a> .
No of partners in last 12mths	91.07%	>2 = 3.39%. 2 = 4.92%. 1 = 91.07%. HSRC 2008
Number of commercial sex acts/FSW/year	200	RNE default assumption for population of 100,000 FSWs & total pop 3mill. Ratio per SW = 0.002. Epi-modelling: 220 acts/FSW/yr.
Number of commercial sex acts/MSW/year	200	RNE default assumption for population of 100,000 MSWs & total pop 3mill. Ratio per SW = 0.002.
Condom wastage during storage and distribution	5%	RNE default assumption.
Percent of condoms distributed through social marketing	20%	Using the private/public mix of 20/80. Not sure if suitable?
Percent of population living in urban areas	57.50%	South African Health Review (SAHR) 2007 by Health Systems Trust (HST). (2001 data)

DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—PREVENTION INTERVENTIONS cont.		
Indicator	Value (for 2007/08 as far as possible)	Source Notes/Assumption
Percent of population living in rural areas	42.50%	SAHR 2007. (2001 data)
% of casual sex acts covered with condoms	25%	HSRC (2008) data reported fairly high reported coverage of condom use at LSI (range from 63–75% at LSI) with discounting as condom use at LSI is much greater than consistent condom use
% using condom in last sex act	64.80%	15–49 yrs = 64.8%. Av for all ages = 62.4%. HSRC 2008
% of married population with casual partners using condoms in marital sex	62.20%	(Soweto study of guys with female partner & casual partners = 37.8% reported unprotect vag sex wth regular female partner). Lane et al. 2009.
<b>STI</b>		
Total number of STI pts in 2008/09	1,600,000	Interview with Eva Marowe, NDOH, 2009.
% of women self-reporting STI/discharge /sore/ulcer (average 15–49 yrs)	4.44%	SADHS 2003
% of men self-reporting STI/discharge /sore/ulcer (average 15–49 yrs)	8.06%	SADHS 2003
Number of new cases of treatable STIs—male (incidence)	8.06% * adult male pop = 91,985,063	SADHS 2003
Number of new cases of treatable STIs—female (incidence)	4.44% * adult female pop = 58,742,788	SADHS 2003
Growth rate in incidence of treatable STIs—female	0.01%	RNE default value.
Percent of STIs that are symptomatic—males	60%	RNE default value. Rather use the rate of seeking treatment from SADHS 2003 below
Percent of STIs that are symptomatic—females	60%	RNE default value. Rather use the rate of seeking treatment from SADHS 2003 below
% females seeking treatment for STIs	64%	SADHS 2003
% males seeking treatment for STIs	55%	SADHS 2003
% of total respondent with STI symptoms	6.63%	HSRC 2008
% males with STI receiving treatment (Coverage 2007)	60%	NSP, 2007. NB. this was a % of faculties that are to be providing STI treatment.
% females with STI receiving treatment (coverage 2007)	60%	NSP, 2007. NB. this was a % of faculties that are to be providing STI treatment.
Ever had HIV test	50.80%	HSRC 2008. Sexual and Behavioural Survey.
HIV test in last 12mths, and received results	96.2 %	HSRC 2008 (NB. This means that of those who were tested in the last 12mths, 96.2% received their results).
% of adult population receiving VCT each year	24.7%	HSRC 2008, coverage for 2007, but very close to NSP goal of 25% by 2011, so underestimates spending.



<b>DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—PREVENTION INTERVENTIONS cont.</b>		
<b>Indicator</b>	<b>Value (for 2007/08 as far as possible)</b>	<b>Source Notes/Assumption</b>
<b>VCT</b>		
Ever had HIV test	50.80%	HSRC 2008. Sexual and Behavioural Survey.
HIV test in last 12mths, and received results	96.2 %	HSRC 2008 (NB. This means that of those who were tested in the last 12mths, 96.2% received their results).
% of adult population receiving VCT each year	24.7%	HSRC 2008, coverage for 2007, but very close to NSP goal of 25% by 2011, so underestimates spending.
<b>PMTCT current &amp; target coverage</b>		
% of pregnant women attending ANC	92%	SADHS 2003
% of pregnant women attending ANC tested for HIV	90%	ASSA 2007
% HIV positive pregnant women treated with ARV	60%	ASSA 2007
% HIV positive pregnant women that receive infant formula	50%	NSP goal for 2007, no other data
% receiving supplements	0%	According to GMR, no supplements being provided
% receiving cotrimoxazole	20%	NSP 2007, no other data
% using PCR	0%	Included this under paed ART (Meyer-Rath)
Meyer-Rath National PMTCT costing		Single dose being replaced with dual dose by 2009.
<b>MASS MEDIA</b>		
Ever having seen or heard 1 communication	80.90%	HSRC 2008
Average number of campaigns per year	1.00	We used the total NSOH budget for Khomonani III, therefore multiplied by 1.
Cost per mass media campaign (Thousands)	R95,000	Note that this is 1/3 of the total MTEF budget for Khomonani. NSP costing used R300,000 but this was the total for 3 years.
<b>BLOOD SAFETY</b>		
Blood units required per 1,000 people	0.31	RNE default value.
% of units of blood for transfusion tested	100%	SANBTS, 2009.
<b>PEP</b>		
Total number of adults & children qualifying for PEP in 2004	28,540	NSP 2007 p8, according to cases reported to SA Police Services. Assuming this reached 30% of need.
PEP kits required per million population	2,000	Required to reach the 28,540 assumed to be 30% of need.
Percent of need that is met	30%	NSP 2007 Target

DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—TREATMENT INTERVENTIONS		
Indicator	Value (for 2007/08 as far as possible)	Source Notes/Assumption
<b>SAFE MEDICAL INJECTIONS</b>		
Average number of immunizations per child 0–23 months	6.8	RNE default value
Number of adult injections per person per year	2.1	RNE default value
Percent of injections that are unsafe	25%	RNE default value
Percent of unsafe injections replaced with AD syringes	60%	RNE default value
Percent reduction in number of other injections	0%	RNE default value
<b>UNIVERSAL PRECAUTIONS</b>		
Total public hospital beds	87,870 (2005)	SAHR 2007 (HST)
Bed utilisation rate	72% (2006)	SAHR 2007 (HST)
Hospital beds per 1000 population (public)	$87870 / \text{Total pop} * 80\% * 1000$	80% public
Percent of hospital beds covered	??	RNE value is 0% because it assumes that these costs are covered automatically by the MOH and are therefore not additional specific HIV costs
<b>MALE CIRCUMCISION</b>		
Number of males circumcised (15–59 yrs)	45%	SADHS 2003, but self-reporting considered higher than actual.
	35%	WHO Global estimate. Because no SA policy on MC, assumed 35% remained constant until 2010.
	33.6%	Lane et al. 2009. Small study of Soweto men (N=363).
<b>ART</b>		
NB. Numbers in need of ART, numbers receiving ART, and total ART costs have been taken from the Boston-HERO National ART costs (Meyer-Rath <i>et al</i> , 2009)		
Meyer-Rath <i>et al</i> , 2009, Assumptions:		
Mortality & loss to followup per annum	7%	Average
Treatment Regimen	Old national guidelines till 2009, then switch to new national guidelines	
CD4 count qualifier	Estimated at both 200 and 350 CD4 (350 from 2009 onwards only)	
Paediatrics	Early paed treatment from 2009 onwards	
Costs included	Full Annual unit costs including ART and non-ARV drug costs, lab costs, staff costs and overheads. Includes SA tender prices for ARVs from Sept 09, OSD from Aug 2009 & task shifting (optional).	
Public / Private	Public only (90% of all need)	90%

<b>DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—TREATMENT INTERVENTIONS</b>		
<b>Indicator</b>	<b>Value (for 2007/08 as far as possible)</b>	<b>Source Notes/Assumption</b>
<b>NON-ART CARE AND PROPHYLAXIS</b>		
Coverage of those requiring care	20.00%	NSP 2007 Target
Included in the unit cost:		
<i>Non-ART per visit</i>	R197.16	
<i>OI treatment</i>	R1,323.33	
<i>Cotrimoxazole</i>	R63.89	
Total unit cost for all non-ART treatment and prophylaxis (assuming 1 of each per annum)	R1,584.38	This is a crude aggregation, it has not been weighted since no data on utilisation of different components
<b>PROVIDER INITIATED TESTING AND COUNSELING</b>		
Medical admissions and new TB cases	342,315	NB this is ONLY new TB patients from SAHR 2007 (HST).
Percent of medical patients receiving diagnostic testing	0%	Assuming that all provider initiated testing is automatically covered by DOH so not added here.
Percent of TB patients receiving diagnostic testing	100%	Assuming that all TB patients are being tested for HIV.
<b>HOME-BASED CARE</b>		
Percent of those with symptoms receiving home-based care*	60%	DOH indicated 80% in 2009 are receiving HBC, so assumed 60% in 2007
<b>PALLIATIVE CARE</b>		
Total patient receiving palliative care not on ART	200,000	
<b>TRAINING FOR ART CARE</b>		
National Strategic HR Plan, 2006—total numbers of new staff involved with HIV	18,838	NDOH, 2006. A National Human Resources for Health Planning Framework. Assumed 3% increase ever year
<b>Nutritional support</b>		
Severe malnutrition under 5 years incidence	5.70%	SAHR 2007 (HST) (2006 DHIS data)
% of children receiving vita supplements	29%	SADHS 2003
Vitamin A coverage children 12–60 months	23.40%	SAHR 2007 (HST) (2006 DHIS data)
Vitamin A coverage infants 6–11 months	95.30%	SAHR 2007 (HST) (2006 DHIS data)
Ratio Undernourished < 5 : Undernourished HIV+	0.400	RNM default value
% Undernourished HIV+ and who get sup% Undernourished HIV+ and who get supplements	60%	Assumed same rate as those receiving ART in 2007
People getting nutritional supplements	60%	Assumed same rate as those receiving ART in 2007
No. Adults on ART in need of nutritional support	43.20%	Assumed same as general poverty rate

<b>DATA REQUIRED AND ASSUMPTIONS FOR THE RNM—MITIGATION INTERVENTIONS</b>		
<b>Indicator</b>	<b>Value (for 2007/08 as far as possible)</b>	<b>Source Notes/Assumption</b>
<b>TB</b>		
Current Number in need of TB treatment	364,164.89	Calculated from number receiving and % receiving
Incidence of TB	5%	SAHR 2007 (HST)
Number of TB patients treated	342,315	SAHR 2007 (HST)
Coverage	94%	SAHR 2007 (HST)
Percent of TB patients receiving TB treatment	49%	ASSA estimates
TB-HIV co-infection rate	60%	Included only TB treatment for HIV+ pts
<b>MITIGATION</b>		
Child poverty rate	60%	IDASA, 2004
General poverty rate	43.20%	SAHR 2007 (HST) (2006 AMPS income)
Severe malnutrition under 5 years incidence	5.70%	SAHR 2007 (HST) (2006 DHIS data)
% of children fully immunized	52%	SADHS 2003
% of children receiving vita supplements	29%	SADHS 2003
Vitamin A coverage children 12–60 months	23.40%	SAHR 2007 (HST) (2006 DHIS data)
Vitamin A coverage infants 6–11 months	95.30%	SAHR 2007 (HST) (2006 DHIS data)
Immunisation coverage of children < 1 year	84.00%	SAHR 2007 (HST) (2006 DHIS data)
Primary school children	all 5–9 year olds, and 1/6th of all 10–14 year olds, multiplied by the primary school enrollment rate.	
Secondary school children	all 10–15 year olds, and 1/3 of the 15–17 year olds, multiplied by the secondary school enrolment rate.	
Identification of OVCS in community	Assumed 3% of all OVCS needed identification.	Check with DSD
Outreach for street children	Assumed 5% of OVCS would be street children in need of outreach. Based on GRN default, no ref.	Check with a street child programme
Training & support to community workers for OVCS	Default had assumed 1CCW per OVC (No ref.). We assumed 1CCW to 30 OVCS per annum.	Check with DSD & OVC programmes
CSG & FCG	Only those OVCS (due to HIV) in poverty (60%)	

## APPENDIX C: Interviews with Key Sources of Data and other Stakeholders

DEPARTMENT/ORGANIZATION	PERSON(S)	CONTACT DETAILS
NDOH—Policy Directorate	Dr. Yogan Pillay, Director of Policy	<a href="mailto:pillay@health.gov.za">pillay@health.gov.za</a>
Natl. Treasury—Social Services Cluster	Dr. Mark Blecher	<a href="mailto:Mark.Blecher@treasury.gov.za">Mark.Blecher@treasury.gov.za</a>
NDOH—HIV financing cluster Floor 17, Hallmark Building 231 Proes Street (after Andries)	Nthabiseng Petrus Khosa, Director of HIV Financing Unit	(+2712) 312 0349(+2712) 312 3121 (084) 650-3358 mobile <a href="mailto:Khozap@health.gov.za">Khozap@health.gov.za</a>
NDOH—ART Hallmark Building	Lillian Diseko, Director	<a href="mailto:diseks@health.gov.za">diseks@health.gov.za</a>
NDOH—HIV, HBC & step-down care Hallmark Building Room 1739	Mokgadi Phokojoe, Director Betty Seate—HCBC	(079) 329-0192 <a href="mailto:Seateb@health.gov.za">Seateb@health.gov.za</a>
NDOH—VCT, Hallmark Building	Tato Chidarike, Director	
Department of Social Development Chief Directorate: HIV and AIDS Directorate: Care and Support HSRC Building 134 Pretorius Street	Ruth Poe, Deputy-Director Stakeholder Coordination and Programme Support Nomawethu Boo, Deputy- Director HCBC Programme Implementation	(012) 312 7535 or (012) 312 7832 <a href="mailto:nomawethub@socdev.gov.za">nomawethub@socdev.gov.za</a>
NDOH—STIs. Hallmark Building	Eva Marume, Deputy Director  Loy Kid, Director	(012) 401-9670 (012) 401-0942 <a href="mailto:marume@health.gov.za">marume@health.gov.za</a> <a href="mailto:loykid@health.gov.za">loykid@health.gov.za</a>
HPI/ Futures—but experience in Education sector	Shaida Asmal	(082) 416-7307 <a href="mailto:sasmall@futuresgroup.com">sasmall@futuresgroup.com</a>
Department of Public Service and Administration	Dr. Siphos Senabe, Chief Director: Employee Health and Wellness Workplace Programmes	(+2712) 336 1048 (+2779) 514 9777 mobile <a href="mailto:siphos@dpsa.gov.za">siphos@dpsa.gov.za</a>
NDOH—pharmacy, logistics/ distribution of drugs/ supplies, etc.	Helecine Zeeman	(012) 312-0362 <a href="mailto:ZeemaH@health.gov.za">ZeemaH@health.gov.za</a>
NHLS blood safety	Dr. Terry Marshall	(082) 909-1792
Khomonani & Soul City—BCC, mass media, etc.	Thami Skenjana  Refilwe Shuping	(012) 312 0151 Secretary: <a href="mailto:sentsd@health.gov.za">sentsd@health.gov.za</a> (012) 312 0150 <a href="mailto:SkeniT@health.gov.za">SkeniT@health.gov.za</a>
NDOH—Nutrition, Hallmark Building 19 <sup>th</sup> Floor, Room 1915	Gilbert Tshitauzi, Director: Nutrition	(012) 312 0418 <a href="mailto:tshitq@health.gov.za">tshitq@health.gov.za</a>
Department of Education HIV and AIDS Lifeskills Programme	Fungisani Mbau, Deputy Director—HIV and AIDS Dr. Faith Kumalo, Director— HIV/AIDS D. Ngobeni, Director Director General's Office	(012) 312-5121 <a href="mailto:Mbau.f@doe.gov.za">Mbau.f@doe.gov.za</a>  <a href="mailto:Ngobeni.d@doe.gov.za">Ngobeni.d@doe.gov.za</a> (012) 312-5531

DEPARTMENT/ORGANIZATION	PERSON(S)	CONTACT DETAILS
SWEAT (organization working with CSWs), Cape Town	Eric Harper, Director NO RESPONSE	<a href="mailto:eric.harper@sweat.org.za">eric.harper@sweat.org.za</a>
SIDA & KPMG	Ria Schoeman Ilani and Charles (KPMG)	<a href="mailto:ria.schoeman@foreign.ministry.se">ria.schoeman@foreign.ministry.se</a>
DBSA	Zaheer Moorad	(083) 445-8676 <a href="mailto:zaheerm@dbsa.org">zaheerm@dbsa.org</a>
PEPFAR/ USAID	Thurma Goldman	<a href="mailto:GoldmanT@sa.cdc.gov">GoldmanT@sa.cdc.gov</a>
UNAIDS, SA office, and RST Office	Catherine Sozi and Henry Damisoni Mark Stirling, Faith Mamba, Mbulawa Mugabe	<a href="mailto:sozic@unaids.org">sozic@unaids.org</a>
UCT: ASSA	Leigh Johnson	<a href="mailto:leigh.johnson@uct.ac.za">leigh.johnson@uct.ac.za</a>
SACEMA	John Hargrove	<a href="mailto:jhargrove@sun.ac.za">jhargrove@sun.ac.za</a>
Imperial College	Kelsey Case	<a href="mailto:k.case@imperial.ac.uk">k.case@imperial.ac.uk</a>
HERO & Boston University	Gesine Meyer-Rath, Lawrence Long	<a href="mailto:gesine@bu.edu">gesine@bu.edu</a>
Clinton Foundation	Vishal Brijlal	<a href="mailto:vbrijlal@clintonfoundation.org">vbrijlal@clintonfoundation.org</a>
TSF for UNAIDS	Carl Schutte & Steve Cohen	<a href="mailto:steve@sdcc.co.za">steve@sdcc.co.za</a>

**APPENDIX D: Summary Sheet of Unit Costs Used in the 2031 Costing***(Note that the NSP unit costs were 2006 prices—Cleary et al 2007)*

<b>SUMMARY OF PREVENTION UNIT COSTS USED IN THE SA 2031 COSTING—ADJUSTED TO 2009 PRICES</b>				
<b>Intervention</b>	<b>Source and Year</b>	<b>Unit of Measurement</b>	<b>Unit cost from Source</b>	<b>Unit cost adjusted for Inflation (2009 prices)</b>
Mass media	NT, 2009. ENE.	Average Annual Budget for LoveLife & Soul City	R95 m	R95 m
C-mobilization (face-to-face)	Cohen et al. 2009	Per person reached with community mobilization	R104.54	R104.54
Life Skills Conditional Grant	NT, 2009. ENE.	Total grant for lifeskill for primary & secondary schools (annual average over MTEF)	R188m	R188m
Primary school teacher training	Stover, 2008	Per secondary school teacher trained in HIV/AIDS	R248.06	R265.18
Secondary school teacher training	Stover, 2008	Per secondary school teacher trained in HIV/AIDS	R248.06	R265.18
Youth reached by peer education for out of school youth	Cohen et al. 2009	Per youth targeted/peer education for out-of-school youth	R93.51	R93.51
Sex worker outreach	Cohen et al. 2009	Per sex worker reached/targeted	R1,202	R1,202.22
Workplace prevention	Cohen et al. 2009	Per person/employee reached in workplace programs (peer education)	R128	R128
STI treatment	Cleary et al. 2007, NSP	Per STI treated in clinics	R70.93	R90.63
Cost of male condom distributed	DOH 2009	Per condom distributed	R0.23	R0.23
Cost of Female condom distributed	STI directorate, DOH, 2009	Per condom distributed	R8.00	R8.00
MSM	Cohen et al. 2009	Per MSM targeted	R411.70	R411.70
VCT	Cohen et al. 2009	Per person tested	R159.58	R159.58
PMTCT screening	Cleary et al. 2007, NSP	Per PMTCT visit (assuming 1screening)	R172.00	R219.77
PMTCT monotherapy	Meyer-Rath et al, 2009	Per woman testing HIV+ and receiving monotherapy	R207.58	R207.58
PMTCT dual therapy	Meyer-Rath et al, 2009	Per woman testing HIV+ and receiving dual therapy	R531.86	R531.86
Mother-Infant Feeding	Cohen et al. 2009	ANNUAL cost of 2 tins per month	R1,080	R1,080.00
Male circumcision	Kahn et al., 2006	Per male circumcised	R350	R447.21
Blood safety	Stover, 2008	Per unit blood screened	R36.10	R38.59
Post-exposure prophylaxis	Meyer-Rath et al, 2009	Per person provided with PEP	R221.50	R221.50

Intervention	Source and Year	Unit of Measurement	Unit cost from Source	Unit cost (2009 prices)
Safe medical injection	Stover, 2008	Per auto-destruct syringe provided (AD) syringes	R1.74	R1.86
Universal precautions	Stover, 2008	Hospital bed per annum	R3,480	R3,720.12
IDUs Harm Reduction	Stover, 2008	Harm reduction programs per person contacted	R261.09	R279.11
IDUs: Counseling and Testing	Stover, 2008	Per IDU targeted	R104.44	R111.65
IDUs: Community outreach and Peer Education	Stover, 2008	Per community outreach/ Peer Education for IDUs	R195.82	R209.33
IDUs: Distribution of needles	Stover, 2008	Per needle distributed and destroyed	R8.96	R9.58
Male condom distributed for IDUs	STI directorate, DOH, 2009	Per condom distributed	R0.23	R0.23
IDUs: Skills Training for a counselor	Stover, 2008	Per counselor trained	R4,351.54	R4,651.80
Prisoner HIV/AIDS programmes	Cohen et al. 2009	Per prisoner covered per annum	R297.60	R297.60
Life skills training—primary school child	Cohen et al. 2009	Per child covered	R20.76	R20.76
Life orientation training—secondary school child	Cohen et al. 2009	Per child covered	R52.70	R52.70
Training (low cost setting)	Cohen et al. 2009	Per trainee per day	R267.36	R267.36
<b>TREATMENT AND CARE UNIT COSTS USED FOR 2031 COSTING—ADJUSTED TO 2009 PRICES</b>				
Service delivery-ART visit	Cleary et al. 2007, NSP	Average weighted cost per ART visit	R158.69	R202.77
Non-ART per visit	Cleary et al. 2007, NSP	Average clinic, CHC and OPD visit cost for HIV care	R154.30	R197.16
Counseling visit	Cleary et al. 2007, NSP	Cost per visit (pre- & post-test)	R62.74	R80.17
Inpatient day	Cleary et al. 2007, NSP	Per inpatient day	R896.31	R1,145.26
TB full course	Cleary et al. 2007, NSP	Cost per patient treated for 8 months	R4,637.15	R5,925.14
Palliative care (with HBC)	Cleary et al. 2007, NSP	Per patient per annum	R603.36	R770.95
<b>Anti-retroviral therapy—Adults &gt;13 years OLD REGIMEN</b>				
First line first 6months	Meyer-Rath et al, 2009	Cost of first-line therapy during first six months/person	R3,785.80	R3,785.80
First line after 6 months	Meyer-Rath et al, 2009	Annual cost of first line per person after 6 months	R5,169.91	R5,169.91
Cost of failed therapy	Meyer-Rath et al, 2009	Cost of failed therapy/annum/person	R5,501.70	R5,501.70



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<b>Intervention</b>	<b>Source and Year</b>	<b>Unit of Measurement</b>	<b>Unit cost from Source</b>	<b>Unit cost (2009 prices)</b>
Adult second line drugs	Meyer-Rath et al, 2009	Annual cost of second line drugs/person	R12,107.13	R12,107.13
Special ART for TB patients	Stover, 2008	Cost of Special ART treatment per TB patient per annum	R1,940.78	R2,074.69
<b>Paediatric ART—Children Under 12 Months</b>				
Cost of first-line therapy during first six months	Meyer-Rath et al, 2009	Cost /child/6 months	R3,126.17	R3,126.17
Cost of first-line therapy after first six months	Meyer-Rath et al, 2009	Cost /child/after 6 months	R3,889.63	R3,889.63
Cost of failed therapy	Meyer-Rath et al, 2009	Cost of failed therapy/child/year	R4,179.16	R4,179.16
Cost of second line therapy	Meyer-Rath et al, 2009	Annual cost of 2nd line therapy/child/year	R4,465.96	R4,465.96
<b>Paediatric ART—Children between 12 Months and 5 years</b>				
Cost of first-line therapy during first six months	Meyer-Rath et al, 2009	Cost of 2nd line therapy per child/6 months	R3,575.34	R3,575.34
Cost of first-line therapy after first six months	Meyer-Rath et al, 2009	Cost of 2nd line therapy per child/after months	R4,659.62	R4,659.62
Cost of failed therapy	Meyer-Rath et al, 2009	Annual cost of failed therapy	R4,974.56	R4,974.56
Cost of second line therapy	Meyer-Rath et al, 2009	Annual cost of 2nd line per child	R5,438.45	R5,438.45
<b>Paediatric ART- Children between 6 and 13 Years</b>				
Cost of first-line therapy during first six months	Meyer-Rath et al, 2009	Cost /child/ per months	R3,666.48	R3,666.48
Cost of first-line therapy after first six months	Meyer-Rath et al, 2009	Cost of 1st line/child/after 6 months	R4,815.85	R4,815.85
Cost of failed therapy	Meyer-Rath et al, 2009	Cost of failed therapy/child/year	R5,135.95	R5,135.95
Cost of second line therapy	Meyer-Rath et al, 2009	Annual cost of 2nd line per child	R6,753.28	R6,753.28
Provider initiated testing and counseling	Meyer-Rath et al, 2009	Cost per client (assumed same as for VCT)	R96.51	R96.51
Nutritional supplements	DOH, 2009	Cost of nutritional supplement per client	R1,406.85	R1,406.85
Nutritional support for adults	Cleary et al. 2007, NSP	Cost of nutritional supplement per adult	R108.00	R138.00
Nutritional support for children	Cleary et al. 2007, NSP	Cost of nutritional supplement per child	R34.64	R44.26
Special ART for patients being treated for TB	Cleary et al.,2006	Cost of TB treatment	R3,448.78	R4,406.69

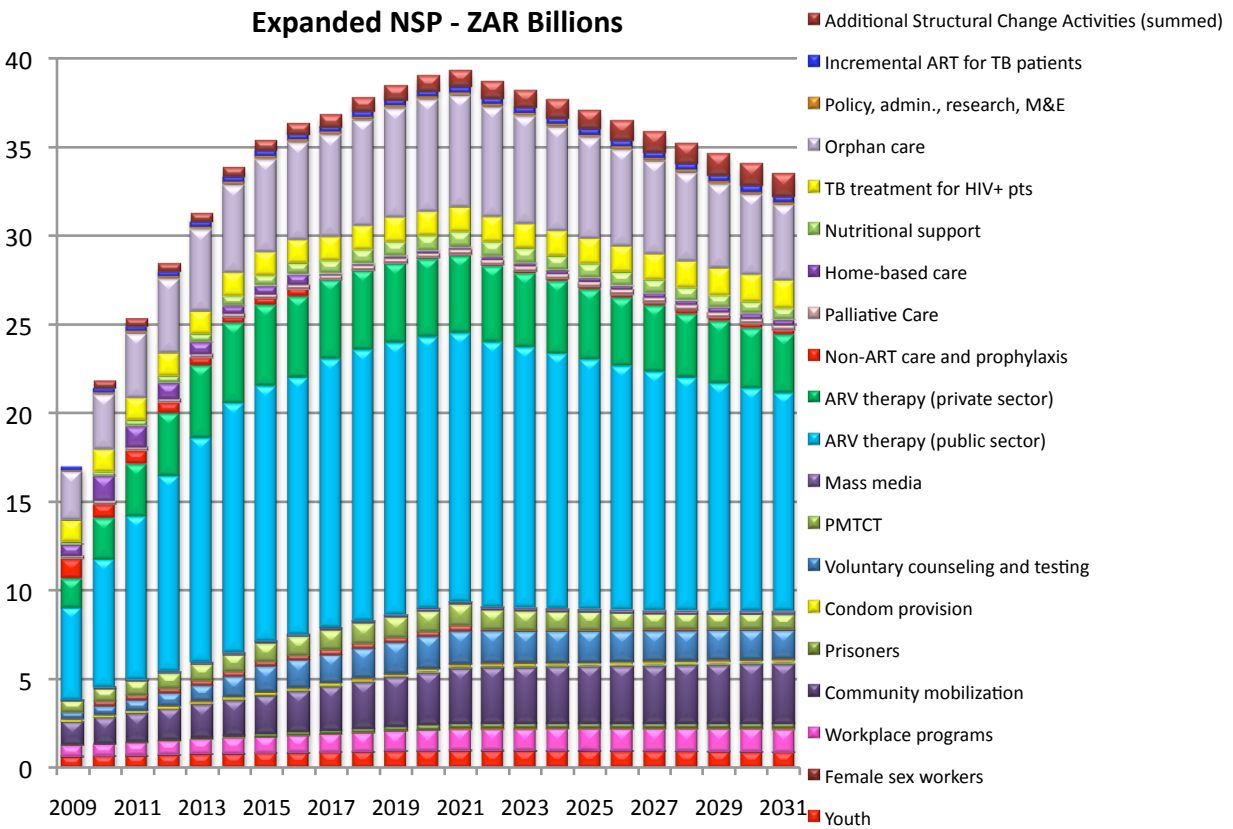
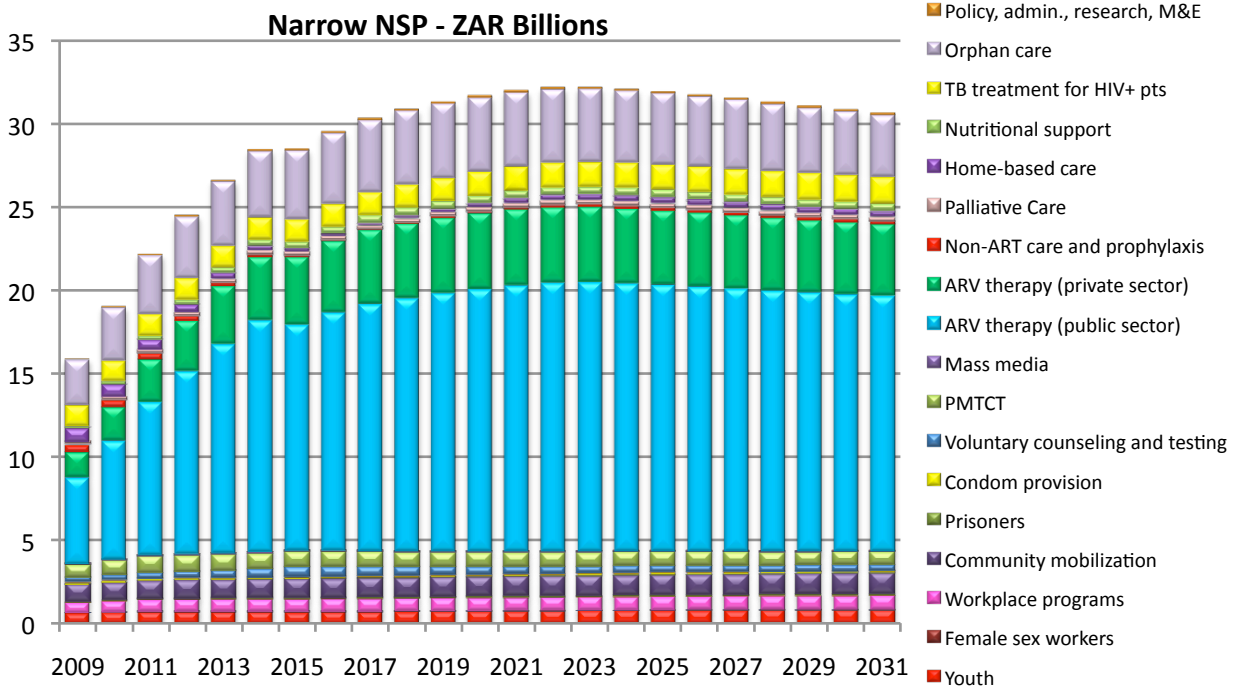
Intervention	Source and Year	Unit of Measurement	Unit cost from Source	Unit cost (2009 prices)
Laboratory monitoring	Cleary et al. 2007, NSP	Cost per laboratory test	R469.88	R600.39
OI treatment	Stover, 2008	Treatment per patient per month	R1,035.67	R1,323.33
Cotrimoxazole	Cleary et al. 2007, NSP	Cost of cotrimoxazole	R50.00	R63.89
OI prophylaxis other than cotrimoxazole	RNM, 2006	Cost of Prophylaxis per patient	R2,239.64	R2,861.71
Nutritional Supplements	DOH, 2009	Cost of nutritional supplement per client	R1,406.85	R1,406.85
<b>TESTS</b>				
PCR Test	Cleary et al. (2007, NSP)	Per Test	R365.00	R466.38
ELISA	Meyer-Rath et al., (2009)	Per Test	R91.56	R91.56
HIV Rapid screen test	Meyer-Rath et al., (2009)	Per Test	R34.65	R34.65
HBsAg	Meyer-Rath et al., (2009)	Per Test	R104.84	R104.84
HIV PCR	Meyer-Rath et al., (2009)	Per Test	R365.00	R365.00
CD4 PLG	Meyer-Rath et al., (2009)	Per Test	R60.00	R60.00
Viral load	Meyer-Rath et al., (2009)	Per Test	R300.00	R300.00
FBC	Meyer-Rath et al., (2009)	Per Test	R45.57	R45.57
Cholesterol & TG	Meyer-Rath et al., (2009)	Per Test	R88.10	R88.10
Glucose	Meyer-Rath et al., (2009)	Per Test	R23.84	R23.84
AST	Meyer-Rath et al., (2009)	Per Test	R38.06	R38.06
ALT	Meyer-Rath et al., (2009)	Per Test	R35.70	R35.70
Creatinine clearance	Meyer-Rath et al., (2009)	Per Test	R50.54	R50.54
Pregnancy latex	Meyer-Rath et al., (2009)	Per Test	R28.05	R28.05
Pregnancy BHCG	Meyer-Rath et al., (2009)	Per Test	R87.26	R87.26
<b>PRIVATE SECTOR ART PROVISION</b>				
Leisegang, R., Cleary, S., Hislop, M., Davidse, A., Regensberg, L., Little, F., Maartens, G. forthcoming.	Annual average cost (1st & 2nd line)	\$2,400.00	R15,362.74	
	Mean monthly cost		Time intervals (months)	
		-4 to 4	5 to 12	13 to 24
		\$377	\$183	\$161

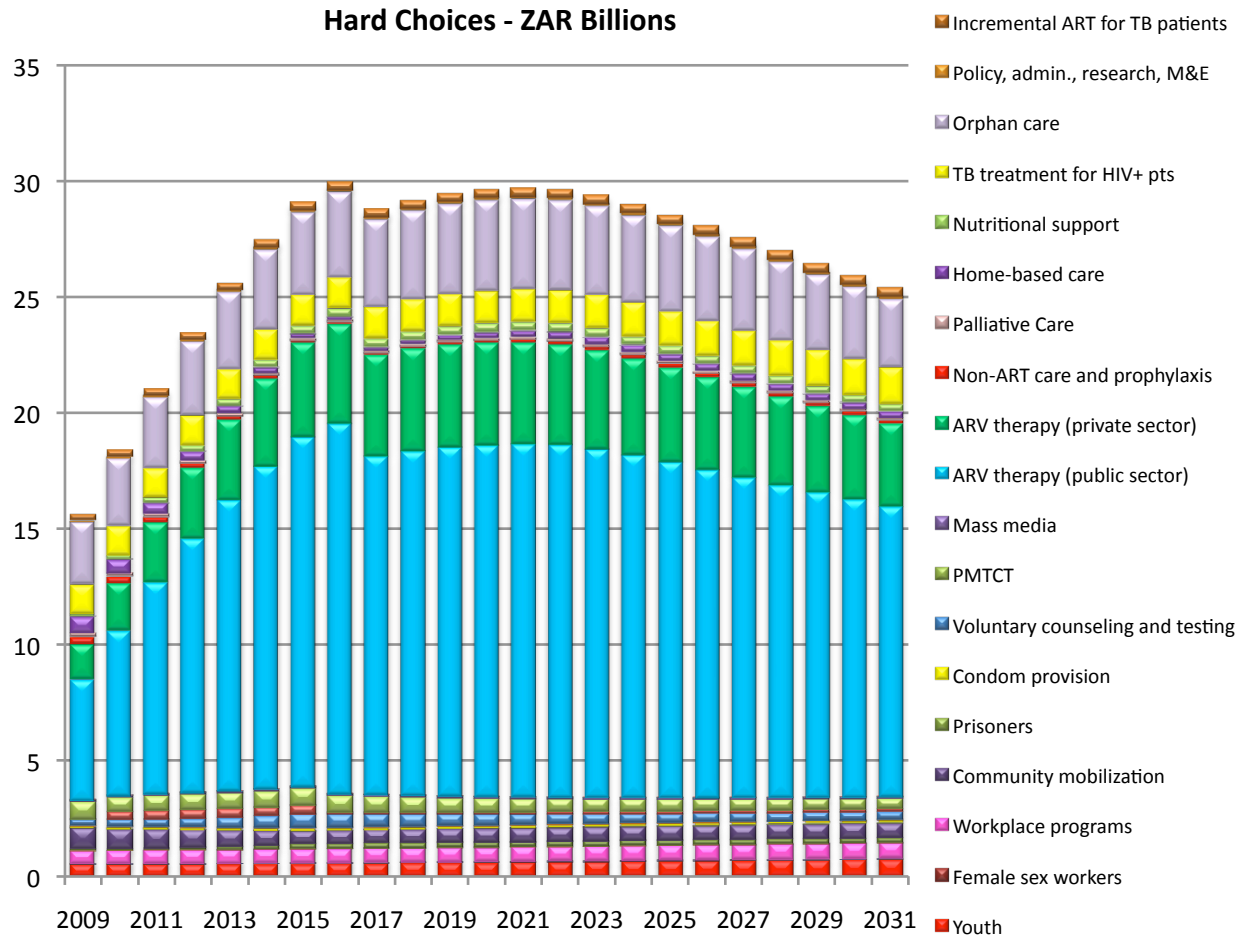
Intervention	Source and Year	Unit of Measurement	Unit cost from Source	Unit cost (2009 prices )
<b>HOME-BASED CARE UNIT COSTS USED FOR 2031 COSTING—ADJUSTED TO 2009 PRICES</b>				
<b>Home-Based Care</b>				
Feeding scheme	Naidu 2005	Beneficiary/annum	R735.00	R982.35
Food parcels/month	DSD, 2009	Per beneficiary/mth	R350	R350.00
Food parcels/annum	DSD, 2009	Per beneficiary/yr	R4,200	R4,200.00
Home visits	Naidu 2005	Cost per beneficiary per annum	R642	R858.05
Skills development	Naidu 2005	Cost per beneficiary per annum	R673	R899.49
Support Group	Naidu 2005	Per participant per annum	R171	R228.55
HBC/mth	Cleary et al, 2007. NSP Costing	Average cost per patient per mth	R84.00	R107.33
HBC/annum	Cohen et al. 2009	Average cost per patient per ANNUM	R1,424.50	R1,424.50
Disability grants	DSD, 2009	Grant per person/yr	R940	R940
<b>ORPHANS AND VULNERABLE CHILDREN UNIT COSTS USED IN THE 2031 COSTING—ADJUSTED TO 2009 PRICES</b>				
<b>FAMILY/HOME SUPPORT</b>				
1. Bednet	Stover, 2008	Cost of bednet	R62	R66
2. Clothes	Stover, 2008	Cost of clothes/year	R247	R264
3. Shoes	Stover, 2008	Cost of shoes/child/yr	R136	R145
4. Blanket and bedding	Stover, 2008	Cost of bedding/child	R140	R150
5. Food (food parcel)	DSD, 2009	o	R4,200	R4,200
6. Microfinance	Stover, 2008	Per person per annum	R930	R994
7. Income generating activities	Stover, 2008	Grant per household	R756	R808
8. Seed for food crops	Stover, 2008	Per family per annum	R309	R330
9. Self-support grants	Stover, 2008	Per family per annum	R807	R863
10. Child support grants	DSD, 2009	Annual grant/child	R3,000	R3,000
Foster Care Grant	DSD, 2009	Annual grant/child fostered	R8,160	R8,160
1. Identification of OVC in the community	Stover, 2008	Per OVC identified	R841	R899
2. Outreach for street children	Cohen et al. 2009	Per person reached with community mobilization	R94	R94
3. Train and support one full-time community worker	Naidu (HERO), 2005	Training per CW	R3,000	R4,009.59
4. Child care	Stover, 2008	Cost of care/child	R751	R803

## APPENDIX E: Relevant Literature Reviewed and Included

Authors	Title
African Development Forum. 2000.	Costs of Scaling HIV Programme Activities to a National Level in Sub-Saharan Africa. Methods and Estimates.
Anglogold Ashanti, 2006	Annual Financial Statements on AngloGold Ashanti's HIV/AIDS programme, 2006. <a href="http://www.anglogoldashanti.com/subwebs/InformationForInvestors/AnnualReport06/default.htm">http://www.anglogoldashanti.com/subwebs/InformationForInvestors/AnnualReport06/default.htm</a>
Bollinger, L. & Stover, L. 2007.	Global Resource Needs Estimates for HIV/AIDS: Methodology for Care and Treatment Interventions. Futures Institute
Bollinger, L., Stover, J., Boulle, A., Cleary, S. 2006.	Resource Needs for HIV/AIDS: Model for estimating resources needed for prevention, care and mitigation.
Bollinger and Stover (2007)	Global Resource Needs Estimates for HIV/AIDS: Methodology for Care and Treatment Interventions. Futures Institute
Charalambous S.I., Muirhead D, Kumaranayake et al., (2007).	Evaluation of a workplace HIV treatment programme in South Africa. <i>AIDS</i> , Jul;21 Suppl 3:S73-8.
Cleary, S., Blecher, M., Boulle, A. 2007.	The costs of the National Strategic Plan on HIV and AIDS & STIs 2007-2011. Dept. of Health, South Africa.
Cleary, S., Boulle, A., Di McIntyre, D. 2006.	The cost-effectiveness of Antiretroviral Treatment in Khayelitsha, South Africa – a primary data analysis. <a href="http://www.resource-allocation.com/content/4/1/20">http://www.resource-allocation.com/content/4/1/20</a>
Cleary, S., Boulle, A., Di McIntyre, D., Coetzee, D. 2004.	Cost-Effectiveness of Antiretroviral Treatment for HIV-Positive Adults in South African Township. Health Economics Unit, UCT
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Dowdy DW, Sweat MD, Holtgrave D (2006).	Country-Wide Distribution of the Nitrile Female Condom (FC2) in Brazil and South Africa: A Cost-Effectiveness Analysis. <i>AIDS</i> ;20(16):2091-8.
Dziedan, G. et al., (2003)	The cost-effectiveness of policies for the safe and appropriate use of injection in health care setting. <i>Bulletin of World Health Organisation</i> , 2003;81(4)
Family Health International (2009)	Strategies for an expanded and comprehensive response to a national HIV/AIDS Response
Futures Group/Constella (2005).	Resource Needs for HIV/AIDS: Model for Estimating Resource Needs for Prevention, Care, and Mitigation, Futures Group, Glastonbury, CT USA
Geffen N. , Natrass N, and Raubenheimer (2003).	The cost of HIV prevention and treatment interventions in South Africa, <i>Social Science Research</i> , CSSR Working Paper No. 28.
Harling, G., Bekker, L., Wood, R. (2007)	Cost of a dedicated ART clinic in a South African peri-urban South Africa Medical Journal. 2007 Aug;97(8):593-6.
Hausler H.P. Sinanovic E. et al. (2006).	Cost of measures to control TB/HIV in public primary health care facilities in Cape Town, South Africa. <i>Bulletin of World Health Organisation</i> , 84; 528-536.
Kahn, J., Marseille, E., Auvert, B. (2006)	Cost-Effectiveness of Male Circumcision for HIV. Prevention in a South African Setting, <i>PLoS Medicine</i> . December 2006 Volume 3(12).
Kelvin, K., Billingham, Saba, J. (2001)	Cost-effectiveness of the female condom in preventing HIV and STDs in commercial sex workers in rural South Africa, <i>Social Science Medicine</i> , Volume 52, Issue 1, January 2001, Pages 135-148
Leisegang, R., Cleary, S., Hislop, M., Davidse, A., Regensberg, L., Little, F., Maartens, G. (forthcoming)	The Cost of ART provision in the Private Sector. <i>PLoS Med</i> forthcoming.
Marseille, E. et al, (2007).	HIV prevention costs and program scale: data from the PANCEA project in five low and middle income countries. <i>BMC Health Services Research</i> 2007, 7:108 doi:10.1186/1472-6963-7-108
Meyer-Rath, G. et al. (2009)	Calculating the National Cost of ART Provision in South Africa, 2009-2016, Health Economics and Epidemiology Research Office, Wits Health Consortium, Johannesburg, South Africa/Center for International Health and Development, Boston University, Boston, USA
Naidu, V. (2005)	The evaluation of costs and process indicators for home community-based care (HCBC) programmes, action and outreach phase ii report, HERO and DSD, 2005
Quinlan, T. Desmond, C. (2002).	Costs of Care and Support. In Kelly, K., Parker, W and S Gelb. HIV/AIDS, Economic and Governance in South Africa: Key Issues in Understanding Response. USAID, Johannesburg.
RNE-SA modified. (2008)	Resource Needs Estimates for South Africa
Stover, J. and Lori B. (2008)	Modified Resource Needs Estimates for South Africa. Futures Institute

## APPENDIX F: Breakdown of Total Resources Required for all Interventions





## APPENDIX G: Total Resources by Intervention for Narrow NSP (ZAR millions)

SCENARIO NARROW NSP (ZAR millions)	2009	2011	2015	2021	2031	2010-2031
<b>Prevention</b>	<b>3,579.9</b>	<b>4,138.7</b>	<b>4,394.2</b>	<b>4,342.6</b>	<b>4,360.5</b>	<b>94,799.1</b>
<b>Priority populations</b>						-
Youth focused interventions	616.2	688.1	684.4	756.7	810.9	16,390.7
Female sex workers and clients	3.1	5.4	5.7	6.0	6.6	130.8
Male sex workers and clients	0.6	1.1	1.1	1.2	1.3	26.2
Workplace	625.8	714.2	744.8	778.6	832.8	16,990.3
Injecting drug users	10.7	17.4	17.8	18.9	20.9	411.5
Men who have sex with men	55.5	88.9	88.9	88.9	88.9	1,939.0
Community mobilization	1,028.9	1,057.2	1,102.9	1,153.1	1,233.6	25,213.5
Prisoners	24.6	24.6	24.7	24.7	24.6	543.6
<b>Service delivery</b>						-
Condom provision	69.1	75.2	78.2	81.7	87.8	1,787.2
STI management	48.3	48.3	48.3	48.3	48.3	1,062.7
VCT	257.0	321.0	580.9	439.3	325.3	9,088.2
Male circumcision	-	-	-	-	-	-
PMTCT	736.7	992.7	912.1	840.7	775.0	18,916.1
Mass media	95.0	95.0	95.0	95.0	95.0	2,090.0
<b>Health care</b>						-
Blood safety	0.6	0.6	0.6	0.7	0.7	14.8
Post-exposure prophylaxis	7.8	8.9	8.9	8.9	8.9	194.5
						-
<b>Care and treatment services</b>	<b>9,832.1</b>	<b>14,744.3</b>	<b>20,174.5</b>	<b>23,388.8</b>	<b>22,824.3</b>	<b>470,486.4</b>
ARV therapy (public sector)	5,212.3	9,125.7	13,474.9	15,898.4	15,260.5	315,215.5
ARV therapy (private sector)	1,520.1	2,581.8	4,098.0	4,547.6	4,310.7	90,221.4
Care and prophylaxis in the absence of ART	434.7	377.1	120.8	179.6	217.2	4,533.7
Diagnostic testing	12.9	13.1	13.7	14.5	16.0	318.1
Incremental ART for TB patients	259.0	313.7	329.9	355.6	402.9	7,775.0
Palliative Care	169.6	185.0	185.0	185.0	185.0	4,062.9
Home-based care	837.5	610.3	195.6	290.7	351.5	7,391.1
Training for ART care	9.1	12.7	20.2	22.4	21.3	444.8
Nutritional support	128.8	245.0	390.6	443.9	415.3	8,706.2
Tuberculosis (Excluding their ART)	1,248.0	1,279.8	1,345.8	1,450.9	1,643.8	31,817.6
						-
<b>Mitigation</b>	<b>2,717.8</b>	<b>3,536.7</b>	<b>4,150.8</b>	<b>4,474.9</b>	<b>3,728.6</b>	<b>90,427.4</b>
Family/home support	543.8	863.7	928.2	975.9	870.5	20,283.3
Community support	36.9	39.9	40.6	39.8	34.2	851.9
Foster Care Grant	2,137.2	2,633.0	3,182.0	3,459.2	2,823.8	69,292.3
						-
<i>Subtotal</i>	<i>16,129.85</i>	<i>22,419.64</i>	<i>28,719.49</i>	<i>32,206.32</i>	<i>30,913.34</i>	<i>655,712.93</i>
						-
<b>Policy, admin., research, M&amp;E</b>	<b>64.5</b>	<b>89.7</b>	<b>114.9</b>	<b>128.8</b>	<b>123.7</b>	<b>2,622.9</b>
						-
<b>Total Millions of Rand</b>	<b>16,194.4</b>	<b>22,509.3</b>	<b>28,834.4</b>	<b>32,335.1</b>	<b>31,037.0</b>	<b>658,335.8</b>
<b>Total Millions of USD</b>	<b>\$ 2,159</b>	<b>\$ 3,001</b>	<b>\$ 3,845</b>	<b>\$ 4,311</b>	<b>\$ 4,138</b>	<b>\$ 87,778</b>

## APPENDIX H: Total Resources by Intervention for Expanded NSP

SCENARIO EXPANDED NSP (ZAR millions)	2009	2011	2015	2021	2031	2010-2031
<b>Prevention</b>	<b>3,806.6</b>	<b>5,343.6</b>	<b>7,702.4</b>	<b>10,253.2</b>	<b>10,046.6</b>	<b>192,149.9</b>
<b>Priority populations</b>						
Youth focused interventions	607.9	671.7	782.5	919.6	815.5	18,198.3
Female sex workers and clients	0.9	3.6	9.6	20.4	22.5	356.9
Male sex workers and clients	0.2	0.7	1.9	4.1	4.5	68.9
Workplace	628.6	714.7	891.3	1,171.5	1,268.6	23,237.4
Injecting drug users	4.2	12.4	29.2	57.0	62.6	981.7
Men who have sex with men	22.2	70.3	167.0	312.7	312.7	5,278.0
Community mobilization	1,273.9	1,553.5	2,133.0	3,060.4	3,315.6	58,597.1
Prisoners	27.7	30.9	46.8	47.0	46.8	937.8
<b>Service delivery</b>						
Condom provision	96.3	108.5	133.6	174.7	190.2	3,480.0
STI management	52.9	57.7	81.1	81.2	81.1	1,645.3
VCT	352.0	554.0	1,427.0	1,823.6	1,576.2	31,816.3
Male circumcision	-	283.5	292.4	306.8	73.5	4,228.9
PMTCT	628.0	769.1	992.0	1,185.4	826.6	21,339.5
Mass media	102.9	110.8	126.7	150.4	190.0	3,265.6
<b>Health care</b>						
Blood safety	0.6	0.6	0.6	0.7	0.7	14.7
Post-exposure prophylaxis	8.2	9.8	13.0	17.7	17.7	337.9
<b>Structural Change</b>						
Structural Change: Workplace		76.5	108.9	169.9	232.8	3,426.8
Structural Change: Comm mobilization		181.2	284.4	484.6	663.1	9,498.2
Structural Change: Education		81.7	114.4	181.5	275.2	3,847.1
Structural Change: Enabling SWs		0.4	1.2	2.8	4.0	52.5
Structural Change: Health Services		0.1	0.3	0.4	0.5	7.7
Structural Change: Out-of-school youth		37.0	46.1	53.2	23.6	934.5
Structural Change: Mass media		12.9	16.9	23.8	38.0	524.9
Structural Change: Post-rape services		1.6	2.4	3.7	4.4	71.2
Structural Change: NGO strengthening		0.1	0.1	0.1	0.2	2.6
						-
<b>Care and treatment services</b>	<b>10,418.2</b>	<b>16,151.7</b>	<b>22,228.3</b>	<b>22,565.7</b>	<b>19,006.7</b>	<b>454,141.3</b>
ARV therapy (public sector)	5,220.2	9,202.9	14,362.7	15,103.9	12,270.9	294,884.0
ARV therapy (private sector)	1,678.2	2,966.2	4,553.0	4,327.9	3,283.0	86,256.4
Care and prophylaxis in the absence of ART	1,079.0	731.2	378.9	127.7	293.6	6,334.0
Diagnostic testing	12.8	13.0	13.4	14.1	15.3	309.5
Incremental ART for TB patients	234.7	263.5	324.7	345.9	384.2	7,406.4
Palliative Care	169.2	184.1	214.1	259.0	259.0	5,204.5
Home-based care	623.6	1,213.7	484.1	129.1	297.0	8,342.1
Training for ART care	13.6	19.2	29.5	33.4	25.6	634.0
Nutritional support	143.8	288.0	543.1	813.4	610.7	13,821.4
Tuberculosis (Excluding their ART)	1,243.1	1,269.7	1,324.7	1,411.2	1,567.5	30,949.0
						-
<b>Mitigation</b>	<b>2,717.8</b>	<b>3,660.6</b>	<b>5,254.6</b>	<b>6,279.5</b>	<b>4,260.1</b>	<b>114,754.2</b>
Family/home support	543.8	774.4	1,273.4	1,782.8	1,401.5	31,698.0
Community support	36.9	54.4	86.0	121.4	87.9	2,080.1
Foster Care Grant	2,137.1	2,831.9	3,895.2	4,375.3	2,770.6	80,976.1
						-
<i>Subtotal</i>	<i>16,943</i>	<i>25,156</i>	<i>35,185</i>	<i>39,098</i>	<i>33,313</i>	<i>761,045</i>
						-
<b>Policy, admin., research, M&amp;E</b>	<b>79.6</b>	<b>118.2</b>	<b>165.4</b>	<b>183.8</b>	<b>156.6</b>	<b>3,576.9</b>
						-
<b>Total Millions of Rand</b>	<b>17,022.2</b>	<b>25,274.1</b>	<b>35,350.7</b>	<b>39,282.2</b>	<b>33,470.0</b>	<b>764,622.3</b>
<b>Total Millions of USD</b>	<b>\$ 2,270</b>	<b>\$ 3,370</b>	<b>\$ 4,713</b>	<b>\$ 5,238</b>	<b>\$ 4,463</b>	<b>\$ 101,950</b>



**APPENDIX I: Total Resources by Interventions for Hard Choices**

SCENARIO HARD CHOICES (ZARmill)	2009	2011	2015	2021	2031	2010-2031
<b>Prevention</b>	<b>3,301.9</b>	<b>3,565.9</b>	<b>3,885.6</b>	<b>3,450.1</b>	<b>3,454.1</b>	<b>77,427.9</b>
<b>Priority populations</b>						
Youth focused interventions	536.4	537.3	549.4	613.7	735.8	13,560.0
Female sex workers and clients	3.1	2.9	9.4	10.0	11.1	194.1
Male sex workers and clients	0.6	0.6	1.9	2.0	2.2	38.8
Workplace	556.3	571.4	596.4	625.4	671.8	13,671.7
Injecting drug users	10.7	7.7	18.2	18.9	20.9	375.2
Men who have sex with men	55.5	88.2	220.5	220.5	220.5	4,355.6
Community mobilization	900.3	793.0	552.0	579.0	622.1	13,650.5
Prisoners	24.6	24.6	24.7	24.7	24.8	543.8
<b>Service delivery</b>						
Condom provision	69.1	71.4	80.1	83.8	90.6	1,815.3
STI management	48.3	48.5	48.7	48.7	48.7	1,070.9
VCT	257.0	319.2	581.7	441.0	328.2	9,113.0
Male circumcision	-	362.6	375.9	105.3	114.7	3,928.2
PMTCT	736.7	630.8	713.3	563.7	449.1	12,636.6
Mass media	95.0	95.0	95.0	95.0	95.0	2,090.0
<b>Health care</b>						
Blood safety	0.6	0.6	0.6	0.7	0.7	14.8
Post-exposure prophylaxis	7.8	12.2	17.7	17.7	17.7	369.3
						-
<b>Care and treatment services</b>	<b>9,520.8</b>	<b>14,286.8</b>	<b>21,484.9</b>	<b>22,194.4</b>	<b>18,870.1</b>	<b>440,602.1</b>
ARV therapy (public sector)	5,212.3	9,125.7	15,028.9	15,172.8	12,495.3	298,039.4
ARV therapy (private sector)	1,520.1	2,581.8	4,098.0	4,389.7	3,570.0	85,103.4
Care and prophylaxis in the absence of	310.5	226.8	97.3	141.6	151.0	3,286.3
Diagnostic testing	12.8	13.1	13.6	14.3	15.6	313.8
Incremental ART for TB patients	235.1	264.6	327.3	350.7	393.4	7,511.2
Palliative Care	134.9	115.6	77.1	77.1	77.1	1,840.6
Home-based care	725.8	475.7	174.9	254.5	271.5	6,157.4
Training for ART care	9.1	12.7	20.2	21.6	17.6	419.6
Nutritional support	114.5	196.0	312.5	341.1	273.3	6,550.5
Tuberculosis (Excluding their ART)	1,245.6	1,274.8	1,335.2	1,431.0	1,605.2	31,379.9
						-
<b>Mitigation</b>	<b>2,717.6</b>	<b>3,086.5</b>	<b>3,568.3</b>	<b>3,899.3</b>	<b>2,965.0</b>	<b>77,683.0</b>
Family/home support	543.8	551.3	572.1	603.5	515.0	12,599.4
Community support	36.9	36.8	40.8	39.9	31.7	832.3
Foster Care Grant	2,136.9	2,498.4	2,955.4	3,255.9	2,418.2	64,251.3
						-
<i>Subtotal</i>	<i>15,540</i>	<i>20,939</i>	<i>28,939</i>	<i>29,544</i>	<i>25,289</i>	<i>595,713</i>
						-
<b>Policy, admin., research, M&amp;E</b>	<b>62.2</b>	<b>83.8</b>	<b>115.8</b>	<b>118.2</b>	<b>101.2</b>	<b>2,382.9</b>
						-
<b>Total Millions of Rand</b>	<b>15,602.5</b>	<b>21,023.0</b>	<b>29,054.6</b>	<b>29,662.0</b>	<b>25,390.3</b>	<b>598,095.8</b>
<b>Total Millions of USD</b>	<b>\$ 2,080</b>	<b>\$ 2,803</b>	<b>\$ 3,874</b>	<b>\$ 3,955</b>	<b>\$ 3,385</b>	<b>\$ 79,746</b>

## APPENDIX J: South Africa's Facts and Forecasts of Key Economic Variables, December 2009

	2004	2005	2006	2007	2008	2009	2010
<b>Growth (real, % change)</b>							
Gdp	4,6	5,3	5,6	5,5	3,7	-1,9	2,2
Gde	7,7	5,9	8,6	6,4	3,3	-1,7	2,7
Pce	6,2	6,1	8,3	5,5	2,4	-3,4	1,5
Gdfl	12,9	11,0	12,1	14,2	11,7	3,6	-1,6
Exports	2,8	8,6	7,5	5,9	2,4	-21,0	4,3
Imports	15,5	10,9	18,3	9,0	1,4	-18,0	6,2
<b>Balance of payments (Rbn)</b>							
Exports	310,5	358,4	447,7	533,8	704,3	523,9	589,1
Imports	311,8	360,4	477,0	574,3	739,9	547,5	640,6
Trade balance	-1,2	-2,0	-29,3	-40,5	-35,6	-23,6	-51,5
Net services	-41,7	-52,5	-64,5	-104,0	-126,1	-105,4	-104,0
Current account	-42,9	-54,5	-93,8	-144,6	-161,7	-128,9	-155,5
Capital account	80,5	88,8	123,6	192,4	187,7	145,0	170,0
Change net reserves	37,5	34,3	29,8	47,8	26,1	16,1	14,5
Gross reserves (eop)	82,8	130,5	178,3	224,3	317,3	271,1	311,4
Current account as a % of gdp	-3,0	-3,5	-5,3	-7,2	-7,1	-4,1	-4,5
<b>Gold price (average per ounce)</b>							
\$	410,4	445,7	605,1	699,0	883,4	967,5	1 071,8
Rand	2652	2844	4103	4937	7294	8067	8366
<b>Exchange rates</b>							
\$/Rand	6,46	6,38	6,78	7,06	8,26	8,34	7,80
Euro-\$	1,24	1,24	1,26	1,38	1,47	1,41	1,42
\$/Yen	108,2	110,2	116,3	117,7	102,5	90,8	91,8
GPB-\$	1,83	1,82	1,84	2,00	1,82	1,53	1,56
Euro-Rand	8,03	7,93	8,51	9,71	12,13	11,77	11,06
Rand-Yen	16,7	17,3	17,2	16,7	12,4	10,9	11,8
GBP-Rand	11,83	11,60	12,48	14,13	15,04	12,78	12,18
<b>Interest rates (end of period)</b>							
Three-month JIBAR	7,47	7,05	9,18	11,25	11,43	7,28	7,38
Prime	11,00	10,50	12,50	14,50	15,00	10,50	10,50
Long bond	8,15	7,43	7,76	8,35	7,33	9,08	9,72
<b>Inflation (average)</b>							
CPI new						7,1	5,7
CPIX (metro and other urban)	4,3	3,9	4,6	6,5	11,3		

Source: Nedbank, 2009.

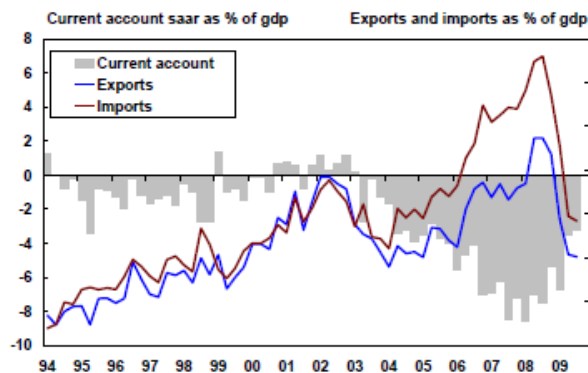
## APPENDIX K: Socio-Economic Indicators and Measures of Inequality in South Africa

Some key socioeconomic indicators for South Africa are presented below:

- GDP in 2007: US\$283,0 billion (UNDP, 2009).
- Per capita GDP in 2007: PPP US\$9,757 (UNDP, 2009).
- Life expectancy at birth: 51.5 years in 2008 (UNDP, 2009).
- Adult literacy rate: 88% in 2007 (UNDP, 2009).
- Human development index: 0.724 in 1995; 0.695 in 2000, 0.683 in 2008 (HDR, 2009).
- Gini coefficient: 0.56 in 1995; 0.57 in 2000; 57.8 in 2008 (UNDP, 2009).
- Expanded unemployment rate: 33% in 1996, 37% in 2001, 41.8% in 2002, 24.3% in 2009 (Statistics SA).
- Living conditions according to the 2007 General Household Survey did not show much improvement from the 2001 Census:
  - 74.5% of households were living in formal dwellings
  - 71.3% of households had access to clean piped water
  - 81.5% of households used electricity for lighting
  - 59.8% of households had access to flush toilets

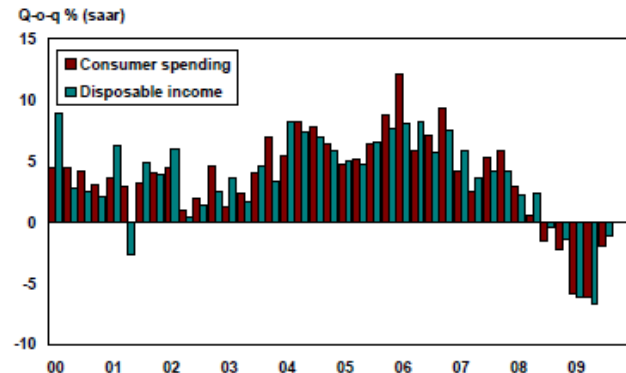
Source: Statistics SA. 2009. General Household Survey Data (2003–2007).

South African Imports, Exports & Current Account saar as % of GDP (1994-1999)



Source: South African Reserve Bank

South African Disposable Income and Consumer Spending (2000-2009)



Source: South African Reserve Bank

## **APPENDIX L: South African HIV/AIDS Structures**

### **South African National AIDS Council (SANAC)**

SANAC was formed in 2002 to combine government and civil society efforts in the response to HIV/AIDS. “SANAC was established as an attempt to get civil society on board and create the foundations for an inclusive structure” (DOH quoted in Strode & Barrett Grant, 2004:21). The sectors represented in the SANAC’s executive management committee include health, labour, agriculture, transport, defence, government, women, youth, traditional healers, traditional leaders, the hospitality sector and people living with HIV/AIDS. Its other functions include advising government on policy development; getting greater involvement from all sectors and enhancing partnerships; monitoring and evaluation; mobilising resources; and recommending appropriate research. SANAC initially had a simple organisational structure, with an executive, a plenary body, an advisory technical task team and a secretariat (Strode & Barrett Grant, 2004:20). The secretariat was situated within the DOH, which became somewhat limiting for its multisectoral coordinating function. However, SANAC was recently restructured, with additional representation from certain sectors, and various Committees were established to focus on specific aspects, such as the Resource Mobilisation Committee (RMC). Additional funding was secured to employ additional staff, and these posts are gradually being filled.

### **National and Provincial Social Sector Departments**

The national level of government in South Africa is primarily responsible for functions and issues of national interest that transcend provincial boundaries, such as defence, prisons and justice. National government undertakes the development of national policies and provides for their funding and monitoring. The Chief Directorate: HIV/AIDS and TB in the national DOH is the primary engine of HIV/AIDS programmes in the health sector. The national DSD also established a chief directorate for HIV/AIDS which coordinates community and home-based care (CHBC) programmes as well as concentrating on interventions targeting women, youth and orphans and vulnerable children (OVCs). The national DoE supports and oversees the running of life skills education programmes in schools by provincial education departments, which are funded by conditional grants transferred to the provinces. The provinces are the primary vehicle for the provision of social services and, as such, play a pivotal role in the government’s response to HIV/AIDS. The provincial health departments each have HIV/AIDS, STI and TB (HAST) units, whose activities include: implementation of IEC programmes; support for prevention and treatment services based at hospitals and clinics; the provision of funding to NGOs and CBOs; the transfer of funds to regions or districts for particular HIV/AIDS interventions; and support to local government for the development and implementation of HIV/AIDS strategies (Hickey, Ndlovu & Guthrie, 2003). A considerable part of the conditional grants is transferred to the local NGOs and CBOs actually involved in service delivery.

The provinces are further broken into districts, and each district is responsible for delivering the services as outline in the NSP. These are guided by the district Business Plans, which are in line

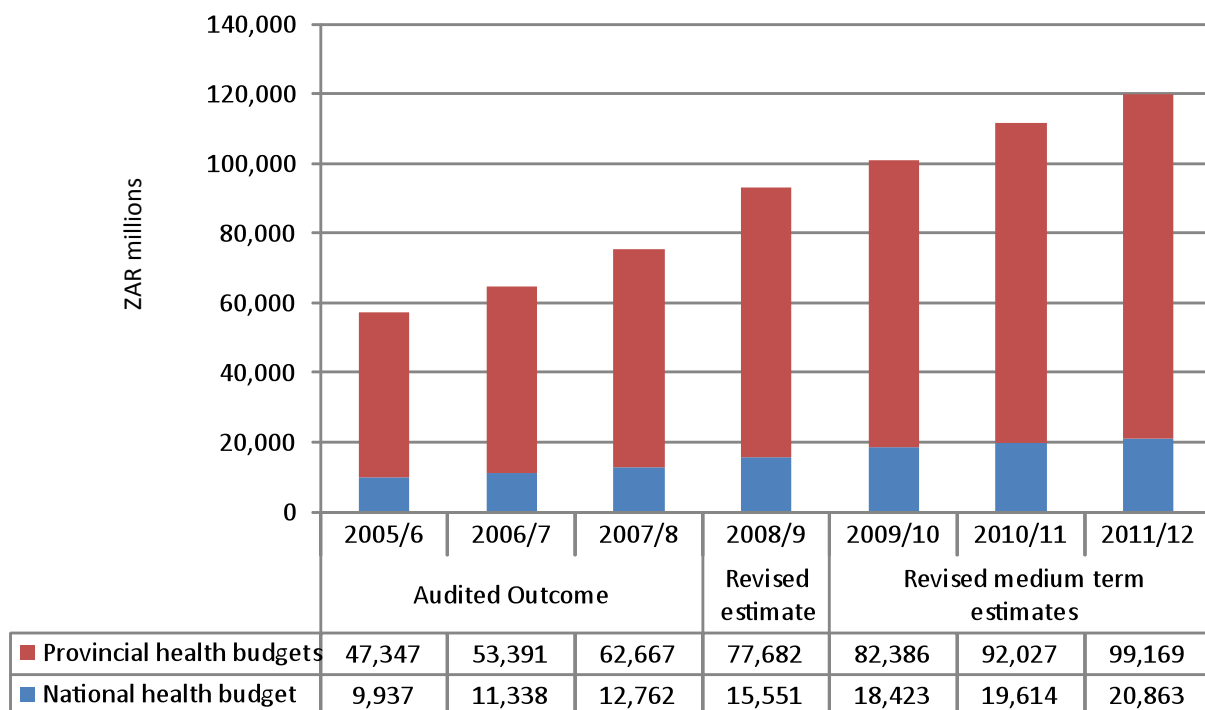
## The Long-Term Costs and Financing of HIV/AIDS in South Africa

with the NSP, and which should be costed and budgeted for. The provinces then develop a provincial business plan and budget, including those from the districts, and submits this to national government. A process of negotiation usually results in a reduced amount of the funding requested are actually approved, where upon the provinces and districts have to adjust their activities and targets downwards. Provincial and district managers complained about a lack of skills and ability to effectively cost, budget and manage the resources for their programmes.

### Other Sectors' Contributions

In addition to the public sector's responsibilities, the business sector, the NGO sector and the development partners all play critical roles in the funding and delivery of HIV/AIDS services, to varying degrees. There has been a lack of coordination of these players and their activities, which is hopefully to be addressed by the newly capacitated SANAC.

## APPENDIX M: Consolidated South African Provincial and National 2009/10 Health Expenditure and Budget Estimates (incl. Adjustment Estimates. ZAR millions)



Sources: Estimates of National Expenditure, 2009; Division of Revenue, 2009; Provincial Budget Estimates, 2009. Medium Term Budget Policy Statement 2009. Ndlovu (2009) calculations.

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