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**ORPHANS OF THE HIV/AIDS EPIDEMIC:  
AN IMPENDING CRISIS FOR SOUTH AFRICAN DEVELOPMENT**

MEGAN LOUW

Stellenbosch Economic Working Papers : 1 / 2003



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<sup>1</sup> This paper is the condensed version of an Economic Honours dissertation prepared for Stellenbosch University, completed under the supervision of Prof Servaas van der Berg. The author gratefully acknowledges his valuable help, as well that provided by Prof Rob Dorrington of the Centre for Actuarial Research.

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**ABSTRACT**

Despite the fact that there are currently millions of HIV-infected people living in South Africa, the worst effects of the HIV/AIDS epidemic have yet to be felt. The most long lasting of these is the anticipated dramatic increase in orphanhood. This paper examines the extent of the impending orphan crisis in South Africa (predominantly using the ASSA2000 model), the impacts of orphanhood on children in HIV/AIDS affected communities, and the role of the Department of Social Development in addressing the issue. National government has committed itself to addressing the impacts of HIV/AIDS on orphanhood, and evidence of this commitment is sought in provincial welfare budgeting flows. Feasibility analysis is conducted to determine the extent of possible effective responses from the Department. Finally, the effects of intervention in the spread of the epidemic on the costs of providing AIDS orphans with a social safety net are considered.

**JEL Classification: I18, I38, J11, H51, H55.**

# **ORPHANS OF THE HIV/AIDS EPIDEMIC: AN IMPENDING CRISIS FOR SOUTH AFRICAN DEVELOPMENT<sup>2</sup>**

Megan Louw

Paper presented at the Economic Research Mini Conference  
held at the University of Stellenbosch on 10 April 2003

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<sup>2</sup> This paper is the condensed version of an Economics Honours dissertation prepared for Stellenbosch University, completed under the supervision of Prof Servaas van der Berg. The author gratefully acknowledges his valuable help, as well that provided by Prof Rob Dorrington of the Centre for Actuarial Research.

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## **1. INTRODUCTION**

At the end of 2001 an estimated 40 million individuals across the world were HIV positive, while 3 million AIDS deaths occurred during the year (UNAIDS 2002:190). Southern Africa is currently the most severely affected region in the world, with South Africa estimated to have the highest total number of HIV-positive individuals globally (UNAIDS 2002). However, the impacts of HIV/AIDS extend well beyond the illness and death suffered by infected individuals. Household, extended family and entire community structures are affected through the loss of caregivers and breadwinners. The focus of this paper is on the children who lose parents to HIV/AIDS, orphanhood being the most long-lasting consequence of the epidemic. It examines the predicted extent of the impending orphan crisis in South Africa as a result of an HIV/AIDS epidemic, the impacts of orphanhood on children in AIDS-affected communities and the role of the government in mitigating the impacts of orphanhood and reducing HIV infection in babies born to infected mothers.

Since estimates of the number of AIDS orphans hinge crucially on the assumptions made regarding the prevalence and spread of HIV/AIDS, the current status of the HIV/AIDS epidemic in South Africa is assessed first, drawing on official information sources and projections generated by the ASSA2000 model. Next, a profile of AIDS orphans is constructed ('AIDS orphans' is used here to refer to children who have lost parents to HIV/AIDS, only some of whom will be infected with HIV themselves), and the likely effects of losing a parent to AIDS are briefly discussed. It appears that most AIDS deaths will occur in impoverished communities, and that the loss of productive household members to this disease will exacerbate poverty. Therefore, the context within which AIDS orphanhood occurs creates a compelling case for social assistance. National government has committed itself to addressing the impacts of HIV/AIDS on orphanhood, and evidence of this commitment is sought in budgeting flows for the provision of welfare services. Feasibility analysis is then conducted on the basis of ASSA2000 Orphan projections to determine whether sufficient funding has been set aside to provide impoverished orphans with a social safety net. Finally, the effect of government's HIV prevention programmes on orphan numbers is considered.

## **2. THE IMPACTS OF HIV/AIDS ON ORPHANHOOD IN SOUTH AFRICA**

### **2.1 POPULATION MODELING IN THE PRESENCE OF AN HIV/AIDS EPIDEMIC**

The major official source of information regarding the progression of the epidemic is the reported result of annual antenatal clinic surveys conducted by the Department of Health at sentinel sites throughout South Africa. Tests for HIV/AIDS and syphilis are run on approximately 16,000 pregnant women at public antenatal clinics on their first visit during the current pregnancy. The 2001 survey revealed that 24.8 percent of women tested were HIV-positive, representing a small (statistically insignificant) increase on the figure of 24.5% for 2000 (Department of Health 2002c: 9). The Department of Health extrapolates the test results for pregnant women to the general South African population using its own model and estimates that approximately 4.8 million South Africans were infected with HIV at the end of 2001 (Department of Health 2002: 12).

During late 2002, the Nelson Mandela/HSRC Study of HIV/AIDS was released, representing the first comprehensive demographic investigation into HIV prevalence in all sectors in South Africa. This study finds similar levels of HIV prevalence amongst pregnant women (24 percent) but suggests that the Department's extrapolation of the results for pregnant women to the rest of the population overstates national prevalence (Shisana 2002:59). The Department of Health models national prevalence assuming that the male infection rate is 85 percent of the female infection rate, and that the HIV infection rate is the same for pregnant and non-pregnant women. However, the Nelson Mandela/HSRC Study finds that these assumptions are incorrect: the male infection rate is 74 percent of the rate for women, and HIV prevalence levels differ across pregnant women and non-pregnant woman (reflecting 24 percent and 14.5 percent prevalence respectively). The study estimates national prevalence at 11.4 percent (Shisana 2002:45). However, it should be noted that this survey excludes children under two and individuals living in institutions such as boarding schools, prisons and military barracks. To the extent that HIV prevalence levels are higher than the national average in these groups (and it is very likely that that they are), the estimate of national prevalence may be slightly conservative.

Having reviewed the available information on the current status of the HIV/AIDS epidemic in South Africa, the estimate of HIV prevalence generated by the ASSA2000 AIDS and Demographic Model is considered. This behavioural component population projection model was developed by the Actuarial Society of South Africa to estimate the demographic impact of the heterosexual (Pattern II) epidemic in South Africa (Dorrington and

Johnson 2002: 34). It is calibrated on antenatal clinic survey results for the years up to and including 2000, as well as reported AIDS deaths which are adjusted upwards by the modelers since deaths are under-registered in South Africa and only death certificates for individuals whose identity is recorded on the population register are computerized by the Department of Home Affairs (Dorrington *et al* 2001: 17). The ASSA2000 model estimates HIV infections in the middle of 2001 at approximately 6 million (ASSA website at [www.assa.org](http://www.assa.org)), an estimate larger than both of those presented above (Johnson and Dorrington 2002: 24 argue that the estimate of mid-year population and the assumptions used by the Department of Health generate a low estimate of total HIV prevalence for South Africa).

## **2.2 QUANTIFYING A CRISIS – ESTIMATES OF ORPHANHOOD IN SOUTH AFRICA**

Regardless of which assumptions or methodologies are employed to estimate the extent to which HIV/AIDS has taken hold, it is clear that the epidemic will have dramatic consequences for the South African population. The most longlasting of these is an increase in orphanhood, since most infections occur within the sexually active segment of the population. The definition of an orphan for purposes of comparing estimates of orphanhood here is the one most frequently used for demographic purposes: a child under the age of 15 whose mother has died. The mother's death may be seen as particularly detrimental to the child's welfare given the role that many mothers play in raising children in societies such as South Africa's (Gregson *et al* 1994: 437). Household expenditure on nutritious foods and other goods consumed by children has been found to be lower when the mother is absent (Case, Lin and McLanahan, 2000 referred to in Case *et al* 2002), and typically a mother is responsible for her child's health investment (Case and Paxson, 2001 referred to in Case *et al* 2002).

The ASSA2000 Orphan model was developed to operate in parallel with the ASSA2000 AIDS and Demographic model. An AIDS orphan in the context of this model is a child whose parent has died while HIV positive, including where the cause of death was not AIDS (Johnson and Dorrington 2001: 9). The number of maternal orphans is estimated by using the ASSA2000 model to estimate female deaths by age for each year, and then projecting the fertility rates of these women backwards to estimate the number of children they leave behind (Johnson and Dorrington 2001: 2). Research indicates that fertility in HIV-infected women declines (Zaba and Gregson 1998 referred to in Johnson and Dorrington 2001: 4) and the model provides for this effect. However, it does not allow for the finding (Zaba referred to in UNAIDS *et al* 2002: 31) that child mortality increases in the year before and after the mother dies from AIDS, irrespective of the HIV status of the child (communication with

Prof Rob Dorrington of the Centre for Actuarial Research at the University of Cape Town). All else equal, one would thus expect the number of maternal orphans projected by this method to slightly overstate the true figure. To calculate numbers of double orphans, paternal mortality is assumed to be a function of the mother's age and level of risk behaviour at the birth of the child. Paternal orphans are calculated by simply extending the dual orphans model (Johnson and Dorrington 2001: i). The deaths of a child's parents due to AIDS are not independent events: aside from sexual interaction, parents will also frequently share HIV risk factors such as socioeconomic status and environment (UNAIDS *et al* 2002: 32). This interdependence between partners' HIV status is automatically reflected in the ASSA2000 population projections through linking the risk behaviour levels of partners (all members of the population are grouped into HIV risk categories on the basis of patterns of sexual activity). The model assumes a rate of mother-to-child transmission of 25 percent for perinatal infection and a further 10 percent for infection through breast-feeding (thus allowing for an overall rate of vertical transmission of 35 percent, consistent with general consensus). This distinction is important since the mode of transmission affects the survival time of the infected child: perinatally infected babies are assumed to survive a median two years from birth, while those infected by mother's milk are assumed to survive for a further six years following the date of infection (Johnson and Dorrington 2001: 7-8).

ASSA2000 Orphan model estimates for maternal orphans below 15 (mid-year estimate) are presented in Table 1 below. Note that no allowance for changes in behaviour or health intervention has been made (the effect of incorporating intervention in the spread of the epidemic on orphan projections is discussed in section 4).

Table 1: ESTIMATES OF MATERNAL ORPHANHOOD - ASSA2000 ORPHAN MODEL

Year	AIDS	All causes
2001	190,993	555,684
2005	685,354	1,011,765
2010	1,531,229	1,794,735

Source: ASSA website ([www.assa.org.za](http://www.assa.org.za)), accessed December 2002

An important caveat must be mentioned here. Demographic modelling involves accepting a set of assumptions and a particular methodology, and varying these will result in different epidemiological or population predictions. Consequently, any projections should be viewed in light of the inherent uncertainty which surrounds estimation (this applies particularly to projections which lie further in the future). To allow for this, and to place the ASSA2000 Orphan projections within the context of estimates generated by other models, some predictions

regarding the number of maternal orphans under the age of 15 made jointly by USAID, UNICEF, UNAIDS and the U.S. Bureau of the Census, are included in the next table.

Table 2: ESTIMATES OF MATERNAL ORPHANHOOD: UNAIDS / UNICEF / USAID / US BUREAU

Year	Due to AIDS	Due to all causes
2001	331,000	622,000
2005	878,000	1,125,000
2010	1,405,000	1,604,000

Source: UNAIDS *et al* (2002)

The ASSA2000 Orphan projections for maternal orphans under 15 are lower than the UNAIDS *et al* figures for years 2001 and 2005, while the ASSA2000 estimate for 2010 is higher. This may be because the UNAIDS *et al* model predicts that the HIV/AIDS epidemic is at a more advanced stage in South Africa than the ASSA2000 Orphan model estimates suggest. UNAIDS estimates that 360,000 South Africans died from AIDS in 2001 (UNAIDS 2002), while the ASSA2000 model yields the lower figure of 194,892 AIDS deaths (ASSA website at [www.assa.org.za](http://www.assa.org.za)). The ASSA2000 Orphan estimates are approximately consistent with the 1998 South African Demographic and Health Survey estimates of orphanhood, having allowed for the expected biases in DHS results (Johnson and Dorrington 2001: 20).

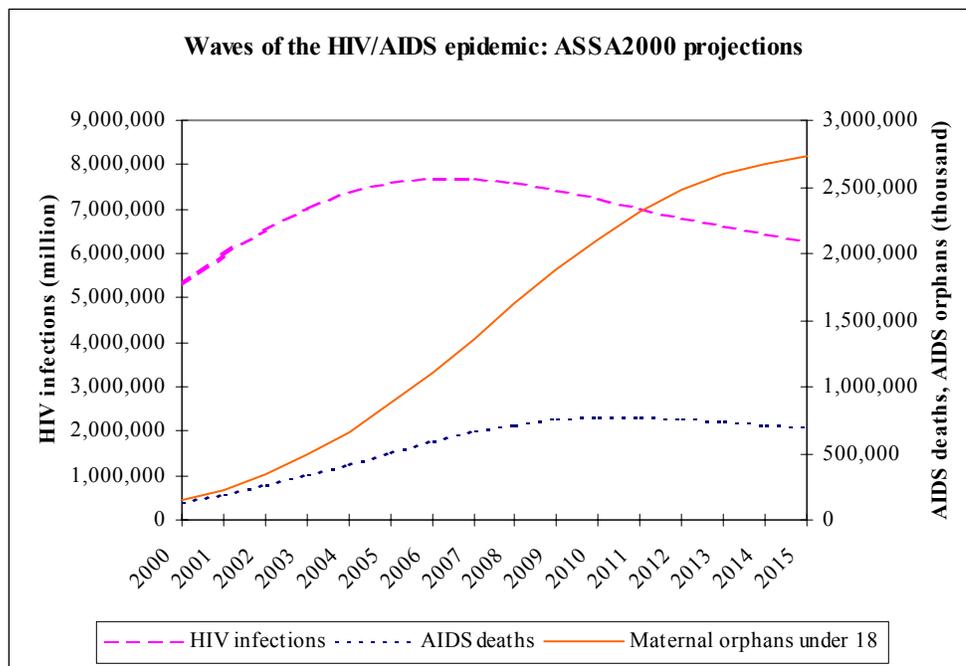
Finally, the estimates generated by government indicate that by 2005, almost 1 million children will be maternal orphans under the age of 15 due to AIDS (Department of Health 2000). It is interesting to note that this estimate of orphan numbers is higher than that generated by the ASSA2000 model, despite the lower Department of Health HIV prevalence estimate for 2001.

### **2.3 PROFILE OF CHILDREN ORPHANED BY HIV/AIDS IN SOUTH AFRICA**

The standard demographic definition of an orphan has been used up to this point. However, assessing the true extent to which increased orphanhood resulting from the spread of the HIV/AIDS epidemic represents a burden on social coping mechanisms in South Africa requires a broader definition of orphanhood. There is little reason to believe that the needs of orphaned children are significantly reduced when they reach 15 years of age (particularly considering the disrupted schooling experienced by many orphans who have been required to care for AIDS-sick

parents - Phiri and Webb 2002: 5). In South Africa a child is legally defined as an individual below the age of 18, and the United Nations Convention on the Rights of the Child (to which South Africa is subject) protects the needs and rights of all children under 18. Consequently, the rest of this paper operates on the definition of an orphan as a child under the age of 18 who has lost a mother (unless stated otherwise). The population projections generated by the ASSA2000 Orphan model are used for purposes of further analysis (projections relating to maternal orphans under 18 were generated by the author in January 2003), and the following diagram presents the predicted extent of the impending orphan crisis within the context of ASSA2000 epidemiological projections. It is assumed that there are no changes in sexual behaviour or health interventions.

FIGURE 1



Sources: ASSA website at [www.assa.org.za](http://www.assa.org.za) and author's ASSA2000 Orphan projections generated in January 2003

HIV prevalence is expected to peak in 2007 when approximately 7.7 million South Africans will be infected, while the number of AIDS deaths will peak around 2010 at an estimated 800,000 per annum (Johnson and Dorrington 2001: 5). By 2015, 2.7 million children under the age of 18 will have lost a mother to AIDS (ASSA website, [www.assa.org.za](http://www.assa.org.za)). If the definition of orphan is expanded to include children under the age of 18 who have lost one or both parents to any cause of death, the number of orphans climbs to 5.67 million in 2015. This figure represents a staggering 33 percent of all children under 18 (Johnson and Dorrington 2001: 14).

Disguised in these national figures are the different stages of progression and varying epidemiological patterns that HIV/AIDS reflects across provinces. The 2001 antenatal clinic survey found that HIV-infection amongst pregnant women at public clinics was highest in KwaZulu-Natal, followed closely by Gauteng, Free State and Mpumalanga (Department of Health 2002c). A different picture is created by the Nelson Mandela/HSRC Study: prevalence levels were found to be slightly higher in the Free State than in Gauteng and Mpumalanga, with prevalence in KwaZulu-Natal ranking only fourth amongst provinces. Prevalence in the Western Cape was found to be higher than expected given the ranking of this province in the antenatal clinic survey (Shisana 2002: 46). The disparity in findings may be attributed to different sampling methods and the varying composition of each province in terms of locality type (Shisana 2002: 61-62).

The ASSA2000 provincial projections (see Dorrington and Johnson 2002) largely reflect the results of the antenatal clinic surveys, and rank provincial prevalence rates accordingly. The epidemic is most severe in KwaZulu-Natal where new HIV infections peaked in 1997 and the number of deaths due to AIDS are expected to outnumber deaths from all other causes by the end of 2002 (Dorrington and Johnson 2002: 41). While prevalence rates express infections as a percentage of the total population, it is also interesting to assess the extent of the impacts of the epidemic in absolute figures. In 2002, KwaZulu-Natal and Gauteng were estimated to collectively have more than half of South Africa's AIDS orphans (Dorrington *et al* 2002: 7). By 2010, KwaZulu-Natal is expected to have more than 600,000 maternal orphans under 18 as a result of AIDS, Gauteng and the Eastern Cape will each have over 300,000 AIDS orphans, and Limpopo Province will have over 200,000 orphans (although Dorrington *et al* (2002: 5) caution that the model does not fit the Limpopo Province very well, probably overstating the effects of the epidemic in this province). Over 100,000 AIDS orphans will be present in each of the provinces of Mpumalanga, the Free State and the North West (see Appendix I).

Regardless of which relative prevalence rankings of provinces are correct, it is clear that the epidemic is currently especially severe in KwaZulu-Natal, Gauteng, Mpumalanga and the Free State. Analysis of the 1995 Income and Expenditure Survey by McDonald *et al* (2000: 452) indicates that households in the Free State received the lowest mean incomes in the country during that year, while the average income of households in Mpumalanga was also below the national average. Further, over half of the populations in KwaZulu-Natal and Mpumalanga live in non-urban areas: rural households earn only two thirds of the income of urban households (McDonald *et al* 2000: 452-453). Further note that the vast majority of AIDS orphans in South Africa are black (Johnson and Dorrington

2001: 11) and therefore are more likely to live in economically vulnerable households - the average income of black households was less than a tenth of the income received by white households in 1995 (own calculation based on figures from McDonald *et al* 2000). The epidemic is most severe in this population group due to factors including low income levels, the effects of forced re-location and migrant labour, and the disintegration of traditional social systems (Dorrington and Johnson 2002: 26).

## **2.4 IMPACTS OF ORPHANHOOD DUE TO HIV/AIDS**

Wherever affected households are located, HIV/AIDS is likely to cause a deterioration in household economic status as household income falls while costs rise. Once an individual falls sick with AIDS, costs of medical treatment including travel expenses to health facilities must be met. If he/she is economically active, household income declines due to his/her reduced productivity, while other members of the household may withdraw from the workforce to care for the AIDS-sick person. Expenditure is increasingly allocated towards health care, leaving less income available to meet the basic needs of household members. Funeral expenses represent a further drain on resources (Gow and Desmond 2002). Following the death of an adult, increased care dependency ratios place a permanent strain on the household budget and may compromise the living conditions of individuals in the household. Case *et al* (2002) analyse Demographic and Health Survey data from 19 African countries and find that orphans live in poorer households, on average. They are more likely to live in households with a large fraction of elderly relatives - although in South Africa, the availability of social pensions implies that in some cases poverty is less severe where children live with elderly people (Case and Deaton 1998) - and less well educated heads, and are more likely to live in households headed by women.

As family resources are diminished in an HIV/AIDS affected household, economic constraints are placed on the capacity of the household budget to support the ongoing education of children. Even if these children were to be exempted from paying school fees, they may continue to face barriers to education access including insufficient funds for purchasing textbooks, uniforms and transport to school, and the risk of social ostracism due to the stigma attached to HIV/AIDS (Badcock-Walters 2002: 97-98). Case *et al* (2002) find that in sub-Saharan Africa, orphans have significantly lower school enrollment rates than non-orphans. In addition to the negative effects of poverty on school enrollment of orphans, the degree of relatedness to the household head affects whether the child attends school. It appears that poor educational outcomes are largely due to the tendency of orphans to live with

distant relatives, a finding which has serious implications for South Africa where orphans frequently rely on extended family for care after their parents die.

The consequences of weakened economic status are also evidenced in orphan health outcomes and general welfare. Children in households affected by HIV/AIDS stand a higher chance of being malnourished and stunted due to reduced food security (as more of the budget shifts towards healthcare). Those who are HIV-infected experience more severe nutritional deficiencies as the physiological impact of the disease compounds the effects of malnutrition. Orphaned children may be forced into child labour, prostitution or crime to earn income, and are frequently vulnerable to sexual abuse. The most vulnerable orphans are likely to be those living on the streets or in child-headed households: these children frequently have no legitimate source of income, with limited access to public services and no access to social security. All orphans will experience the psychological trauma of surviving a parent's death, and will often need to deal with the stigma attached to AIDS in many communities (Giese 2002). Some will be infected with HIV themselves.

The challenge that increased orphanhood represents to South African social and economic development will be a significant one if population projections such as those presented here are considered reasonable. The support structures on which fostering by extended family or other members of the community depend are already under heavy pressure due to AIDS, unemployment and crime (Ewing 2002: 85). As a result, it is unlikely that the community will be able to absorb the full impacts of the expected rise in orphan numbers. The following section is concerned with mitigating the impacts of orphanhood from a welfare perspective: it evaluates the extent to which the Department of Social Development has incorporated the impending orphan crisis into its plans, and estimates the magnitude of the required response. (It is likely that orphans will also require assistance with receiving adequate access to health and education services, but these issues will not be addressed further here.)

### **3. RESPONSES FROM THE DEPARTMENT OF SOCIAL DEVELOPMENT**

#### **3.1 NATIONAL POLICY AND BUDGETING WITH RESPECT TO ORPHANS OF THE HIV/AIDS EPIDEMIC**

The official guiding document pertaining to the needs of children affected by HIV/AIDS is the National Integrated Plan for Children Infected and Affected by HIV/AIDS (the NIP), to be implemented jointly by the Ministries of

Health, Education and Social Development. Implementation of the envisioned NIP objectives involves the establishment of a home- and community-based care and support (HCBCS) programme including care for orphans, strengthening voluntary counselling and testing initiatives, and providing life skills and HIV/AIDS education in schools (i.e. the core component of the strategy) - Streak (2002: 149-150). The Department of Social Development (DSD) is to take responsibility for the social relief component embodied in the HCBCS programme. In formulating the DSD's position on HIV/AIDS, the Social Welfare Plan on HIV/AIDS explicitly recognizes that the traditional coping mechanism of care by extended families is being weakened by the disruption of family structures due to increasing AIDS deaths and the additional burden of care for AIDS orphans. It consequently acknowledges that government assistance is required (Department of Social Development 1999). However, the Department simultaneously wishes to reduce direct reliance on state support (Streak 2002: 170). It would therefore seem that the DSD intends the bulk of the burden of orphan care to fall upon households and communities, with assistance provided by the state where communities are unable to provide the required levels of care.

In terms of the NIP, pilot projects are implemented at district level in provinces so that strategies can be tested before roll-out to the rest of the region. It appears that the DSD's plans in this regard are significantly more ambitious than either their budget will allow for (a conditional grant of R48 million was allocated to the DSD for implementation of the HCBCS programme during the 2002/03 year: Hickey 2001) or than the limits of their provincial capacity can provide (Hickey 2001, Adams and Claassen 2001). Operating each site requires the presence of sufficient trained staff and physical infrastructure, as well as strategic planning by high-level government officials in each province. To achieve nation-wide coverage would therefore be expensive, mobilising many additional resources or drawing resources away from their current employment in competing uses. It would also be time-consuming to make the investment necessary to support communities in this way, and a need for urgent large-scale assistance is reflected in the dramatic orphan estimates that were presented earlier.

More immediate relief for economically vulnerable orphans may be provided through the social grants available to these children: the Child Support Grant (CSG), the Foster Care Grant (FCG) and the Care Dependency Grant (CDG). Expenditure on these grants is financed through the equitable share allocated to provinces, taking into account provincial economic and demographic profiles (National Treasury 2002a: 157). Analysis of medium term trends in provincial social security allocations (from which these child grants are funded) reveals that real increases exceeding 10 percent have been provided for over one or more years for all provinces excluding Gauteng (the wealthiest province on the basis of mean household incomes in 1995 - McDonald *et al* 2000:452)

and the Northern Cape (see Appendix 1). Since expanding access to the CSG is a major factor driving the increase in social security expenditure, it is unsurprising that most of the growth in spending will occur where access to grants has been limited and where a large proportion of poor children reside, i.e. KwaZulu-Natal, Mpumalanga, Limpopo and the North-West (National Treasury 2001: 64).

Apart from the value of total social grants paid (R28 billion in 2002/03 according to National Treasury 2002b: 73), the government must also cover the cost of grant administration, which is currently estimated at R20 per grant (communication with Prof Servaas van der Berg at Stellenbosch University). The considerable funding implications of expanding the provision of social grants thus constitute the greatest hurdle to providing support to communities in this manner. The major advantage of this form of assistance, however, is that relief is available almost immediately to impoverished individuals with access to a DSD office (rather than years later, depending on the provincial HCBCS schedule).

In the next section, the forms of social assistance available to South African children are discussed in terms of the requirements for accessing each grant and the implications for mitigating poverty in the case of the economically vulnerable children orphaned by AIDS. Following this analysis, the models of care available to orphans are evaluated in an effort to determine which represent the most desirable practical responses to dealing with the impending orphan crisis.

## **3.2 FORMS OF SOCIAL ASSISTANCE AVAILABLE TO SOUTH AFRICAN CHILDREN**

### 3.2.1 The Child Support Grant (CSG)

At the time of writing, the CSG (value R140) is available to children below the age of 7 years: to qualify, the combined income of the primary caregiver and his/her spouse should not exceed R13,200 per annum if the caregiver lives in a rural area or in an informal dwelling in an urban area. Alternatively, if the caregiver lives in an urban formal dwelling, he/she and his/her spouse should receive a combined income not exceeding R9,600 per annum (Department of Social Development 2002). This grant was introduced in April 1998 to improve the living conditions of the poorest 30 percent of children in South Africa (approximately 3 million individuals) by 2003 (Van der Berg 1997, Van der Berg and Bredenkamp 2002).

A committee of inquiry chaired by Prof Vivene Taylor was recently appointed to make recommendations for improving the coverage and functioning of the current social security system. Having considered the implications of the HIV/AIDS epidemic for children, the Taylor Committee called upon the DSD urgently to make provision for assisting the increasing number of orphans. Recognising that AIDS orphans are often taken in by extended family who care for the children on an informal basis and thus do not have access to the FCG, the Committee proposed that the CSG be extended to all children under 18, supplemented by an appropriate nutrition and child care support programme and free health care. It was also argued that access to this grant should be simplified, and that child-headed households should be assisted with gaining access to the CSG (Taylor Committee 2002: 59-60). While the small size of the grant may attract criticism from those who believe it is not large enough to make a significant improvement in a beneficiary's material living conditions, it offers less of the perverse incentives which may accompany a larger grant, for example the incentive for caregivers to drop out of the workforce once another source of income is available (Van der Berg and Bredenkamp 2002: 12).

Streak (2002: 167) lists some of the obstacles to achieving comprehensive coverage of the CSG, which include a lack of access to regional DSD offices due to transport costs and inadequate physical infrastructure, and a lack of formal identification documents (which are prerequisites for accessing social assistance). The registration of births in South Africa is not comprehensive, with one estimate suggesting that as few as 49 percent of South African children possess birth certificates (Smart 1999: 9). Those who do have birth certificates may have difficulty in accessing them once their parents pass away. Another practical problem is that applications for social assistance may take a number of months to process, while the need for help is urgent. The first payment should be made by the DSD within 3 months, but some applicants have waited more than a year (Black Sash and ETU 2002).

### 3.2.2 The Foster Care Grant (FCG)

A grant which is more substantial than the CSG is the FCG (value R460 at the time of writing), a grant to support legally appointed caregivers in covering the costs of caring for children on a temporary basis. To qualify for this grant, the child must be placed in the home of foster parents by the courts and the foster child's annual income (received in the form of maintenance from biological parents, for example) may not exceed R11,040 (i.e. twice the annual amount of the foster child grant). Further, the applicant and the foster child must both reside in South Africa at the time application for the grant is made (Taylor Committee 2002: 57).

While take-up of the FCG has increased substantially over the past five years partly as a result of the HIV/AIDS epidemic (National Treasury 2001: 68), the obvious obstacle to expanding coverage is the lengthy process involved in placing a child with foster parents. Prior to the court application, a social worker screens the prospective parents to determine their suitability for the performance of fostering duties. Following placement, social workers must visit the foster home and complete a report on the child every two years. The administration of these foster care arrangements requires the existence of sufficient institutional capacity: a developed system employing the services of a number of social workers such as the one in the Western Cape is needed to expand foster care on significant scale (National Treasury 2001: 68). In response to the AIDS orphan crisis, the Committee of Inquiry suggested that the foster application process be simplified and that a way be developed for informal caregivers (such as extended family members) to obtain access to the FCG (Taylor Committee 2002: 60).

Since the FCG is a relatively large grant, considering the incentive effects on households of expanding foster care for AIDS orphans is important. A beneficial effect arises as poor families willing to look after additional children but unable to do so due to limited resources, are encouraged to foster orphans. However, detrimental effects arise when children are commercialized due to the associated stream of income and exploited for additional labour in foster households. Further, poorer households are likely to find the additional income represented by the grant relatively more attractive than other households are, with the result that orphans may be absorbed into households which are even more economically vulnerable than those from which they came (Subbarao in Levine 2001: 23).

### 3.2.3 The Care Dependency Grant (CDG)

Finally, the CDG (value R640) is available to children under 18 who require permanent home care (i.e. they may not be permanently cared for in a government institution) due to severe physical or mental disability, as verified by a medical officer and approved by the medical pensions officer (Barberton 2000: 5). The combined annual income of the applicant and his/her spouse is not to exceed R48,000 per annum, and the income of the child in question may not exceed R15,360 (i.e. twice the annual value of the grant): Department of Social Development (2002).

In addition to the lack of awareness of the CDG amongst the public and difficulties experienced with administering the grant, Footner (as referred to in Barberton 2000:14) and Streak (2002: 168) highlight a further impediment to achieving more comprehensive coverage: the vague disability criterion, which may be subjective and exclusionary. A move to extend the CDG to orphans who are suffering from AIDS should be accompanied

by clarification of the disability criterion and shortening the registration process due to the urgency with which the grant is required. Note also that the grant is large and may be associated with significant adverse incentive effects.

### 3.3 EVALUATING MODELS OF CARE FOR ORPHANED CHILDREN

Currently, a continuum of care for orphans and vulnerable children is operational in South Africa, ranging from models requiring a high degree of government involvement such as statutory residential care, through to those receiving little or no state support such as informal foster care. Most government resources are to be channeled to programmes aimed at preventing disintegration of community coping mechanisms, or early intervention in terms of which support for the most vulnerable children is provided (Department of Social Development 2000). Affordability does not, however, imply that these forms of care provide an acceptable quality of nurture. Consequently, three major broadly defined models of care are assessed next in terms of their suitability for the rising number of AIDS orphans, using two criteria: cost implications (bearing in mind the forms of social assistance available to vulnerable children) and their ability to provide orphans with some accepted minimum level of care. Following the approach of Desmond and Gow (2001: 16), a minimum standard of care is defined to include the existence of a care-giver and attainment of various survival elements: food, clothing, shelter and hygiene.

#### 3.3.1 Statutory residential care

Accommodating orphans in statutory residential care facilities represents the most expensive form of care: institutions are frequently expensive to maintain due to high staff-to-child ratios and fixed costs, and the financing of medical treatment facilities - where these exist - to support HIV positive children (Desmond and Gow 2001: 24). The costs to the state involve a subsidy of R1000 per child per month (communication with Mr A. Mohammed, Social Services: Provincial Administration of the Western Cape) and the costs of placing and supervising the child. Analysis conducted by Gow and Desmond (2001: 21) revealed that the total cost of providing a minimum level of care exceeded R3,500 per child per month in a case study on Nazareth House, a children's home in the Western Cape (note that medical treatment costs constitute a large component of this cost). Apart from the substantial financial implications of providing institutional care, other disadvantages include the adverse effects on a child's intellectual and social development due to removal from family and community, and possible neglect and abuse once the monitoring role which the community traditionally fulfils with respect to the quality of childcare, is no longer performed. A perverse incentive exists as a consequence of the provision of a

comparatively high level of material support within institutions: if this form of care is expanded, impoverished families may abandon AIDS orphans to the care of children's homes - thereby exacerbating the financial burden borne by the state (McLeod in Levine 2001: 11).

It may seem that institutional care is a model poorly suited to the care of orphans within the South African environment: indeed, provincial welfare departments have decided not to register new homes for this purpose (Loening-Voysey and Wilson 2001: 25). However, Gow and Desmond (2001: 40) point out that children's homes are often a measure of last resort for children who have slipped through the gaps in extended family care-giving and other informal care options (many institutionalised children have been abandoned by their families due to factors such as poverty or the stigma associated with HIV/AIDS: McLeod in Levine 2001: 11), and in some cases emergency medical is available to children who have fallen ill with AIDS. Desmond and Gow (2001: 19) argue that a higher percentage of HIV positive children than HIV negative children are likely to be found in institutions due to the greater burden of care associated with illness. An important benefit of institutional care is that children are likely to be provided with the minimum standard of care as defined above. The institutional setting also provides an ideal environment within which to provide vulnerable children with social support services that help them cope with the effects of the epidemic (McLeod in Levine 2001: 11).

### 3.3.2 Foster care

Formal fostering requires an individual to become a surrogate parent and differs from adoption in that fostering is intended to be a temporary measure, financial assistance is provided by the state in the form of the FCG, and supervision of the child by social workers continues after placement. Various models of statutory foster care exist: traditional foster care is provided when a child is placed in the home of foster parents by a court, community foster care is provided when an individual or couple from the community live on premises owned by a child welfare society, receiving an allowance from the society in addition to the FCG, and collective foster care is provided when children remain in their own homes but receive care from volunteers (this form of care is often provided in the case of child-headed households). Apart from the monthly cost of the FCG, there are costs involved with placing and supervising the child: a social worker spends an average of 15 hours per year to monitor the well-being of each foster child (Loening-Voysey and Wilson 2001: 36).

In terms of providing a minimum standard of care, formal foster care is significantly more cost-effective than statutory residential care, although the degree to which this is true depends on whether an orphan is HIV positive

(Desmond and Gow 2001: 24). Community-oriented foster models offer the additional benefit of allowing the foster child to remain within his/her community, enhancing personal development. Further, prospects for educational development are improved through access to free schooling (Smart 1999: 52), although in reality children will often require additional resources such as school uniforms in order to be accepted for tuition (Loening-Voysey and Wilson 2001: 54). Despite these advantages, all formal fostering approaches require the existence of organizational structures and sufficient personnel to assist with the foster process, the implementation of relevant protocol, and funding additional to state subsidies (Loening-Voysey and Wilson 2001: 36).

Informal fostering occurs where care is offered to vulnerable children by members of the community, due to kinship duties or other factors. This form of care is very common in poverty-ridden rural communities where access to social services is extremely limited, for example in some parts of the Eastern Cape (Loening-Voysey and Wilson 2001: 27, Desmond and Gow 2001). Care-givers currently have no claim to the FCG and they can only register their young dependants for the CSG if the regional welfare office is easily accessed. Possible advantages of this form of care include the reinforcement of indigenous coping mechanisms as the community provides support, and the maintenance of the child's kinship ties and identity (Loening-Voysey 2001: 27). In fact, Subbarao *et al* (2002) suggest that this form of fostering is the best intervention as the child's psychological development and integration into society are encouraged, his/her interests may be effectively promoted by family members, and the risk of being ostracized by other members of society is reduced. However, it is very likely that the minimum standard of care will be not be attained under the severely resource-constrained conditions in which informal fostering usually occurs. Insufficient access to education and health care services, clothing and food renders the quality of care provided in such settings inadequate (Desmond and Gow 2001: 34-35). Informal care-giving clearly creates a case for financial support although it is not economically viable to add extended family members and other community volunteer care-givers to social workers' caseloads through formal foster care (Loening-Voysey and Wilson 2001: 35). Possible policy measures to assist with informal fostering thus include simplification of the process required to access the FCG, or the extension of the CSG to children up to and including 17.

### 3.3.3 Other forms of home- and community-based care

In addition to fostering, other models of care developed within communities are supported by the government for coping with the impending AIDS orphan crisis. These forms of support may be broadly divided into two categories: community-based support structures and home-based care and support models. The first refers to

organizations which offer support (material, informational or other) to caregivers who look after orphans within their communities of origin. Income generation projects provide one example of community-based support: funds are generated to provide caregivers within the community with material assistance, for instance where orphans' grandparents look after them. Note that the provision of a minimum standard of care is not ensured, and no supervision is available to protect children against abuse and exploitation or to support caregivers in the execution of their duties (Desmond and Gow 2001: 38). Further, this approach assumes that there are enough members in the community to provide the required services, which is not always the case particularly where the HIV/AIDS epidemic is in advanced stages.

Home-based care and support is provided to dependents in households where a chronic illness such as HIV/AIDS prevails. An example of this form of care is found at Sinosizo in KwaZulu-Natal, where children in vulnerable situations (such as where a parent is dying from AIDS) are identified and referred to social workers (Desmond and Gow 2001: 29). Social workers then visit the household to prepare the family for death and make arrangements for the child to be placed with foster parents after death. Bereavement counseling is also provided. This model provides an important safety net to support vulnerable children where care by extended family fails, and frequently operates in very poor communities where kinship caregiving dominates. The disadvantages of the model once again relate to the availability of enough volunteers and social workers in HIV/AIDS affected areas (Loening-Voysey and Wilson 2001: 32). Perhaps the greatest challenge to the effective provision of care in terms of home- and community-based models lies in addressing the shortage of resources in affected areas; expanding the CSG to children aged 0-17 is therefore a relevant option.

Thus, while informal models of care appear to be the most desirable and economically viable alternatives for dealing with the orphan crisis, the option of statutory residential care (particularly for purposes of short term care) should be maintained as a safety net for the most vulnerable AIDS orphans. Models of care based in the community require material support through state grants or other subsidies as well as the existence of adequate infrastructure for the provision of basic social services, if an acceptable quality of care is to be provided. Since investment in infrastructure is only undertaken over the long term and the state wishes to reduce dependence on social assistance as part of the national HIV/AIDS coping strategy, it does not appear that the interests of many orphans are effectively protected at present.

### 3.4 FEASIBILITY ANALYSIS: EVALUATING OPTIONS FOR EXTENDING SOCIAL ASSISTANCE TO AIDS ORPHANS ON THE BASIS OF COST

Next, the cost implications of providing a social safety net for AIDS orphans during 2002/03 are analysed. The extent to which each province is currently able to assist orphans is assessed, and the required growth in provincial social security budgets is highlighted. Two scenarios are considered: the first considers the proposal to extend the CSG to children aged 0-17, while the second allows for 25 percent take-up of the FCG amongst orphans with the CSG extended to the remaining under-18 individuals. The reason for not incorporating the status quo regarding the age limit on the CSG is that at the time of writing the ruling party had already committed itself to realizing an increase in the age until which poor children can access the CSG (ANC 2002). The cost of extending the CDG to all children who are suffering from AIDS as a result of contracting HIV from their mothers is also included since this form of assistance supplements the social protection accorded by either the CSG or the FCG. The calculations use projected orphan numbers that were generated using the ASSA2000 Orphan model (note that the provincial version of the model, which was used here, is still provisional – Dorrington *et al* 2002: 1).

In terms of scenario 1, the CSG is extended to the poorest thirty percent of children under 18 (since this grant was introduced in April 1998 with the aim of reaching the poorest thirty percent of children - Van der Berg 1997), some of whom will belong to HIV/AIDS affected households. The intention of government to strengthen the capacity of affected communities to cope with the epidemic without encouraging dependence on the state is taken into account here, since no provision for the expansion of formal care is made. However, the need for economic support in HIV/AIDS affected households is recognized through making provision for regular financial assistance to them. The extent to which these households benefit will depend on whether basic social services are available to them, and on whether any additional benefits such as free health care or schooling are provided to children who qualify for the grant. It will also depend on whether the children who receive the grant are HIV positive since chronic illness is associated with ongoing medical costs; to cover this possibility, the scenario allows for provision of the CDG to HIV-positive children during their last year of life (i.e. when AIDS is in the terminal stage).

Scenario 2 allows for an increase in coverage of the FCG to 25 percent of all maternal orphans under 18, either due to substantial simplification of the foster application process or extension of this grant to informal caregivers such as extended family members. Owing to the greater value of the FCG and foster care administration requirements, this scenario is more onerous to the state since it implies a greater dependence on public resources than scenario 1

does. However, the more substantial economic support combined with state supervision mean that a basic living standard is provided more effectively for foster children than for the children who receive assistance in terms of scenario 1 above. The assumption that the CSG is made available to the poorest thirty percent of children under 18 is employed here as well: the number of individuals who qualify for it is calculated as the CSG beneficiary total determined in scenario 1 less the orphans who receive the FCG (in other words, it is assumed that the orphans who are in foster care would otherwise have qualified for the CSG).

For purposes of feasibility analysis, the number of orphans sick with AIDS is calculated as the sum of children who contracted HIV through breast milk five years before (since the ASSA2000 Orphan model assumes that these individuals live for a median six years from time of infection) and those who were infected perinatally one year before (these children are expected to live a median two years). The number of CDG beneficiaries is thus calculated as the sum of individuals who currently receive the grant (recorded in the Department of Social Development's SOCPEN database) as well as AIDS-sick orphans. Those who qualify for the CSG are calculated as the poorest thirty percent of children under 18 (using the ASSA2000 estimate of the total number of children under 18 in the SOCPEN database), and 100 percent take-up is assumed. In practice, it is possible that more children may register for the grant: the income of the care-giver's spouse is not always taken into account in applying the means test, and the lack of physical monitoring systems within communities means that some beneficiaries who in reality lie above the poverty line, can access the grant (Van der Berg 2002). Those who qualify for the FCG are calculated as 25 percent of the number of total orphans under 18, as estimated by the ASSA2000 Orphan model. The required growth in each provincial social security budget is then calculated as the difference between the 2002/03 figure contained in National Treasury (2002c) and the same figure less the annual amount spent on child grants (calculated as the value of child grants paid in June 2002 multiplied by 12) and adding the total amount payable for child grants as per scenario 1.

The cost implications of pursuing Scenario 1 are explored first. In June 2002, the ASSA2000 model predicted that there were 18,860,713 children below the age of 18 in South Africa (SOCPEN database). Providing the poorest thirty percent of these individuals (i.e. 5.66 billion children – a very large group of beneficiaries) with the CSG would cost the government R9.51 billion in 2002/03. Extending the CDG to AIDS sick children in 2002/03 adds a further 3,245 beneficiaries (the sum of provincial ASSA2000 Orphan estimates generated by author) to the group of 36,638 children who currently receive this grant (Department of Social Development: SOCPEN database). Annual expenditure on the CDG would therefore total approximately R306 million. All provinces

excluding the Northern Cape would need to increase the budget for social security payments during 2002/03 by at least 20 percent to meet the needs of their poorest children and those who are suffering from full-blown AIDS. An increase of over 40 percent in Gauteng's social security allocation for 2002/03 would be required, although since this is the wealthiest province, it is possible that less of the country's poorest children reside here and therefore that the burden of welfare provision is overstated by these calculations.

Given the calculated real annual increases in social security spending, none of the provinces have budgeted for the provision of social assistance on the large scale implied by scenario 1 over the medium term. If one assumes that the budgeted increases in funding over 2003/04 and 2004/05 are earmarked for spending on children only (it is of course highly unlikely that this is the case), then the Eastern Cape, Free State, Limpopo and North West provincial DSD offices may be able to embark on a social assistance outreach to orphans and other economically vulnerable children of the dimensions envisioned here. The shortfalls in required growth on the social security budgets for Gauteng, Mpumalanga and the Northern Cape reflect that the extension of social assistance as a comprehensive safety net for children has not been provided for in any significant way in these provinces - a particular concern in the case of the first two, which are severely affected by HIV/AIDS.

Scenario 2 is a more expensive alternative due to the greater costs involved with foster care. There are an estimated 885,980 orphans due to all causes in 2002/03 (the sum of all provincial ASSA2000 Orphan estimates generated by author), and providing a quarter of these children with the FCG costs R1.22 billion. Providing the remaining poor children under 18 with the CSG and AIDS sick children with the CDG results in total expenditure on child grants of R10.66 billion. To estimate the actual cost of providing foster care, the costs associated with foster administration must also be considered. In their calculations, Desmond and Gow (2001: 26) allow for R13 per child per month to cover social worker's costs; multiplying this figure by 25 percent of the orphans under 18 in 2002 yields an additional cost of R35 million. If provincial DSD offices appear not to be well prepared financially for extending the CSG to poor children aged 0-17, they certainly are unable to embark on a programme as ambitious as the one comprising scenario 2. It is interesting to note that the formula for provincial budgetary planning currently includes no reference to the FCG (Ewing 2002: 88). Further, unlike the scenario 1 costs which are assumed to remain approximately stable (due to the independence of CSG eligibility criteria from orphan status), scenario 2 costs rise as the orphan crisis worsens: by 2010, the social assistance envisioned in terms of scenario 2 costs R12.29 billion. The benefit of pursuing this approach is that orphans are well targeted as children

who require additional material support as a result of the economic distress characterizing many HIV/AIDS affected households (particularly in later years, orphans due to AIDS constitute the vast majority of orphans).

The analysis above confirms the expectation that a trade-off exists between achieving an acceptable level of care for orphaned children and minimizing the costs of responding to the orphan crisis. The calculations reveal that provincial social security budgets do not reflect acknowledgement of the fact that HCBCS initiatives will only meet the needs of a fraction of the children who lose parents to HIV/AIDS. Supporting the roll-out of HCBCS initiatives with the large-scale provision of grants to economically vulnerable children (and thus to the impoverished households from which they come) appears to be beyond the financial ability of provincial DSD offices. However, the extent of the deficit differs across provinces, with Mpumalanga possibly the worst off due to the double burden of a severe HIV/AIDS epidemic and widespread poverty.

On the basis of ASSA2000 projections and the assumptions employed for the purposes of this analysis, it appears that insufficient resources are being channeled into safeguarding the welfare of AIDS orphans. However, the effects of intervention in the spread of the epidemic on the population have not yet been taken into account. Attention turns to a brief evaluation of the likely impact of government's HIV/AIDS awareness and prevention campaigns on orphan numbers, and the consequences for welfare spending.

#### **4 ESTIMATING THE EFFECTS OF HIV PREVENTION PROGRAMMES ON ORPHAN NUMBERS AND THE COSTS OF PROVIDING A SOCIAL SAFETY NET**

On 5 July 2002, the Department of Health was ordered to make mother-to-child transmission prevention drug Nevirapine widely available to HIV positive mothers at public health care facilities, ending a controversial law suit brought by amongst others the Treatment Action Campaign. The drug reduces HIV infection through vertical transmission by an estimated 50 percent (Johnson and Dorrington 2001: 22), a benefit which persists to some extent even when breast-feeding and thus ongoing exposure to HIV occurs (WHO 2000). The analysis that follows allows for the effects of nation-wide Nevirapine provision on orphanhood. Further, the Nelson Mandela/HSRC Study indicates that the HIV/AIDS awareness and testing programmes (which are referred to earlier as part of the national HIV/AIDS strategy) are succeeding in reducing new infections (Shisana 2002: 10), and this development is also incorporated in orphan projections.

The 'change scenario' in the ASSA2000 Orphan model assumes the provision of Nevirapine and formula feed from 1 July 2001 for use in 40 percent of births to HIV positive mothers, gradually expanding in coverage until these items are provided for 90 percent of births to HIV positive mothers from 2005 on. It is assumed that perinatal transmission is reduced by 50 percent when Nevirapine is provided, and that access to formula feed reduces breast-milk transmission by 50 percent (Johnson and Dorrington 2001: 22-23). In retrospect, it is clear that the assumptions regarding the time-frame of MTCTP roll-out are not entirely correct: however, two of the provinces worst hit by HIV/AIDS in terms of the absolute numbers of infections (i.e. KwaZulu-Natal and Gauteng) as well as the Western Cape were already extending Nevirapine to pregnant women on a significant scale prior to the court ruling in July 2002. The ASSA2000 Orphan model allows for a change in sexual behaviour in response to awareness programmes and life skills training by assuming that condom usage doubles over the period July 2001-2005, and that the number of sexual partners decreases by 15 percent over this period. Further, the model assumes that treatment of STDs improves so that the prevalence is reduced during the same time (Johnson and Dorrington 2001: 24). No anti-retroviral intervention to prolong the life of individuals already infected with HIV is provided for in the model.

The graph in Appendix II compares the number of maternal orphans under 18 in the 'no-change' (i.e. base) model with those in the 'change' model. While at first the difference is barely noticeable, by the middle of 2015 (when orphan numbers are expected to peak under the assumptions of the ASSA2000 Orphan model) there are approximately 183,000 less orphans under the 'change' scenario. This result runs counter to intuition: surely the provision of life-saving medical treatment should increase the number of orphans in South Africa by enabling some children born to HIV positive mothers to survive. However, the assumptions relating to the reduction in risky sexual behaviour and physiological vulnerability which underpin the 'change' model imply that less adults will contract HIV, reducing the number of children at risk of contracting HIV from their mothers, and decreasing the risk of orphanhood and the negative consequences associated with AIDS orphan status (malnutrition, poor education and so on). Further, adopting these assumptions implies that HIV negative children face a smaller probability of becoming infected once they commence sexual activity due to living in a society where greater precaution is taken against contracting the virus.

Having established that intervening in the spread of the epidemic will decrease orphan numbers, the effect on the welfare system in terms of the two scenarios sketched above, is analysed. In terms of scenario 1, the cost of providing the CSG to children aged 0-17 remains unchanged at R9.51 billion, with savings in the CDG as a result

of adopting preventative measures ranging from R4,260 in 2003 to R16.76 million in 2015 (thus representing a relatively small decrease in total child grant costs). Allowing for intervention in the case of scenario 2 is associated with a more substantial saving: assuming that 25 percent take-up of the FCG amongst orphans occurs, it will cost the DSD approximately R200 million less by 2010 to provide orphans with a social safety net than in the absence of intervention measures. A detailed comparison of the costs of providing the envisioned social security under the 'change' and 'no change' projection scenarios is provided in Appendix III.

It appears from the above analysis that it is in government's material interests to continue with awareness and testing programmes, since the burden of care for orphans is reduced as a consequence of intervening in the spread of HIV/AIDS. Providing Nevirapine to pregnant HIV mothers does not reverse this result. However, comprehensive roll-out will require overcoming the present problems within the Department of Health: insufficient physical infrastructure and staffing, as well as a lack of management and technical capacity at both national and provincial levels (McCoy *et al* 2002: 3-4).

## **5 CONCLUSION**

The government's intention to strengthen the ability of communities to deal with HIV/AIDS is commended: orphaned children should be allowed to develop within their communities, and the epidemic is occurring on a scale too large to make provision for institutionalising all of those who require assistance as a result of the disease. This desire for community self-sufficiency should not mask neglect of the serious conditions facing HIV/AIDS affected communities though. Children who are born into poverty often lack any opportunity to alleviate their vulnerability, and losing parents to AIDS may worsen their economic and social circumstances. As has been seen, the ability of the HCBCS programme to alleviate this vulnerability is currently limited. The provision of social grants to mitigate the effects of being orphaned in impoverished communities may be a more immediate and effective, albeit expensive, alternative. While the constraints on resource availability which are operant in any developing country must also be acknowledged in the South African setting, it is emphasized here that the severity of the orphan crisis and its adverse consequences for this country demand the best response possible. As the Department of Social Development (2000) succinctly notes: "the HIV/AIDS epidemic is the principal challenge/threat facing South Africa and has clearly an enormous impact on children in the coming decade".

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## **APPENDIX I: THE BURDEN OF ORPHAN CARE BY PROVINCE**

### **EASTERN CAPE**

#### **BUDGETING FOR THE PROVISION OF SOCIAL SECURITY**

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	3,824,225	4,323,201	5,232,773	5,976,467	6,459,939
Real increase			19.68%	12.57%	6.83%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

#### **EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS**

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	363,878	17,632	7,570	R 59,806,305	R 717,675,664	
Scenario 1: CSG and CDG	978,158	17,632	7,932	R 150,129,421	R 1,801,553,051	20.7%
Scenario 2: FCG and CDG	943,556	34,602	7,932	R 153,091,339	R 1,837,096,065	21.4%

Source: 1 Department of Social Development: SOCPEN database

#### **ASSA2000 ORPHAN PROJECTIONS**

Population aged 0-18 (June 2002)<sup>1</sup>: 3,260,527

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	110,988	2,929	57	41	
1998	112,512	5,384	94	70	
1999	115,348	9,419	148	115	
2000	120,175	15,724	223	181	
2001	127,573	25,079	321	272	
2002	138,409	38,322	442	391	362
2003	153,534	56,239	582	539	512
2004	173,406	79,400	737	714	697
2005	198,594	108,169	899	911	918
2006	229,016	142,404	1,060	1,119	1,171
2007	264,471	181,599	1,210	1,326	1,451
2008	303,851	224,594	1,341	1,520	1,749
2009	345,669	269,824	1,447	1,688	2,055
2010	386,871	314,730	1,527	1,824	2,358

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

**FREE STATE****BUDGETING FOR THE PROVISION OF SOCIAL SECURITY**

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	1,091,358	1,314,894	1,470,491	1,656,084	1,867,011
Real increase			11.07%	11.16%	10.76%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

**EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS**

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	114,810	9,057	1,445	R 19,837,246	R 238,046,952	
Scenario 1: CSG and CDG	323,871	9,057	1,644	R 50,560,404	R 606,724,844	25.1%
Scenario 2: FCG and CDG	310,432	13,439	1,644	R 50,694,807	R 608,337,686	25.2%

Source: 1 Department of Social Development: SOCPEN database

**ASSA2000 ORPHAN PROJECTIONS**Population aged 0-18 (June 2002)<sup>1</sup>: 1,079,572

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	36,874	1,871	35	25	
1998	38,249	3,334	56	43	
1999	40,327	5,650	86	68	
2000	43,425	9,136	126	104	
2001	47,791	14,104	174	150	
2002	53,757	20,854	229	208	199
2003	61,550	29,597	289	275	272
2004	71,208	40,396	350	350	357
2005	82,697	53,148	408	426	454
2006	95,711	67,505	458	499	558
2007	109,838	82,954	498	563	666
2008	124,381	98,773	526	614	773
2009	138,594	114,183	542	649	876
2010	151,312	128,169	548	668	969

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## GAUTENG

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	2,174,191	2,461,516	2,683,663	2,954,539	3,117,343
Real increase			8.44%	8.92%	4.65%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	220,325	14,728	3,972	R 37,702,533	R 452,430,396	
Scenario 1: CSG and CDG	876,896	14,728	4,504	R 132,423,260	R 1,589,079,119	42.4%
Scenario 2: FCG and CDG	840,690	36,207	4,504	R 137,234,393	R 1,646,812,718	44.5%

Source: 1 Department of Social Development: SOCPEN database

### ASSA2000 POPULATION PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 2,922,988

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	83,684	4,391	88	65	
1998	89,747	8,226	147	112	
1999	98,094	14,548	230	183	
2000	109,564	24,329	337	281	
2001	124,838	38,544	468	409	
2002	144,827	58,100	615	567	532
2003	170,130	83,598	771	748	727
2004	200,748	115,156	924	943	954
2005	236,298	152,307	1061	1137	1,205
2006	275,611	193,794	1171	1313	1,471
2007	317,105	237,786	1246	1455	1,738
2008	358,394	281,815	1286	1553	1,995
2009	397,051	323,337	1294	1605	2,229
2010	429,546	359,193	1279	1616	2,432

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## LIMPOPO PROVINCE

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure	Estimated Actual Expenditure	Medium Term Expenditure Estimates		
	R'000	R'000	R'000	R'000	R'000
Social security	2,544,731	2,842,125	3,515,784	4,091,553	4,336,924
Real increase			22.17%	14.48%	5.06%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	323,036	5,966	4,453	47,433,857	R 569,206,282	
Scenario 1: CSG and CDG	807,151	5,966	4,749	118,785,004	R 1,425,420,043	24.4%
Scenario 2: FCG and CDG	779,687	27,464	4,749	124,829,212	R 1,497,950,540	26.4%

Source: 1 Department of Social Development: SOCPEN database

### ASSA2000 ORPHAN PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 2,690,503

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	87,340	2,487	49	35	
1998	88,940	4,524	80	60	
1999	91,453	7,809	125	97	
2000	95,473	12,861	185	150	
2001	101,394	20,232	261	222	
2002	109,856	30,498	353	315	296
2003	121,438	44,164	456	428	412
2004	136,329	61,518	567	558	553
2005	154,868	82,705	680	701	718
2006	176,794	107,417	787	846	902
2007	201,755	135,064	881	986	1,102
2008	228,741	164,603	960	1,110	1,310
2009	256,485	194,721	1,019	1,211	1,518
2010	282,792	223,604	1,058	1,287	1,719

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## MPUMALANGA

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	1,243,995	1,423,885	1,794,774	1,913,714	2,070,234
Real increase			24.37%	5.86%	6.91%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>1</sup>	146,410	2,331	1,594	R 21,059,773	R 252,717,275	
Scenario 1: CSG and CDG	403,538	2,331	1,925	R 58,799,590	R 705,595,079	25.2%
Scenario 2: FCG and CDG	384,492	19,045	1,925	R 63,821,667	R 765,859,999	28.6%

Source: 1 Department of Social Development: SOCPEN database

### ASSA2000 ORPHAN PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 1,345,126

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	46,054	3,951	69	53	
1998	48,763	6,763	106	84	
1999	52,745	11,027	153	127	
2000	58,429	17,171	211	184	
2001	66,135	25,577	278	255	
2002	76,182	36,541	351	338	331
2003	88,712	50,183	425	430	435
2004	103,548	66,353	496	525	553
2005	120,396	84,672	559	616	681
2006	138,574	104,420	611	698	814
2007	157,354	124,752	648	764	949
2008	175,727	144,632	673	813	1,078
2009	192,745	163,081	685	843	1,197
2010	207,029	178,897	688	856	1,301

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## NORTH WEST PROVINCE

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure	Estimated Actual Expenditure	Medium Term Expenditure Estimates		
	R'000	R'000	R'000	R'000	R'000
Social security	1,693,081	1,821,437	2,201,308	2,534,381	2,701,833
Real increase			19.51%	13.38%	5.58%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	204,668	4,191	2,446	R 29,980,071	R 359,760,847	
Scenario 1: CSG and CDG	460,921	4,191	2,684	R 68,174,344	R 818,092,122	20.8%
Scenario 2: FCG and CDG	443,588	17,333	2,684	R 71,793,296	R 861,519,553	22.8%

Source: 1 Department of Social Development: SOCPEN database

### ASSA2000 ORPHAN PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 1,536,404

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	47,316	2,020	40	29	
1998	49,246	3,684	65	49	
1999	52,039	6,371	102	80	
2000	56,094	10,486	150	123	
2001	61,716	16,442	209	180	
2002	69,333	24,645	278	252	238
2003	79,266	35,400	353	337	327
2004	91,602	48,832	431	431	433
2005	106,344	64,867	505	529	554
2006	123,119	83,088	570	623	685
2007	141,437	102,861	622	707	822
2008	160,385	123,245	659	774	959
2009	178,961	143,198	681	820	1,090
2010	195,611	161,379	691	847	1,210

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## NORTHERN CAPE

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure	Estimated Actual Expenditure	Medium Term Expenditure Estimates		
	R'000	R'000	R'000	R'000	R'000
Social security	589,085	610,456	640,454	672,038	704,922
Real increase			4.60%	4.36%	4.13%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	46,669	5,721	877	R 9,161,295	R 109,935,545	
Scenario 1: CSG and CDG	114,409	5,721	901	R 19,225,308	R 230,703,692	18.9%
Scenario 2: FCG and CDG	111,283	3,125	901	R 17,593,975	R 211,127,705	15.8%

Source: 1 Department of Social Development: SOCPEN database

### ASSA2000 ORPHAN PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 381,363

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	9,461	166	3	2	
1998	9,775	322	6	4	
1999	10,188	590	10	7	
2000	10,748	1,027	15	12	
2001	11,494	1,697	22	18	
2002	12,502	2,672	30	26	24
2003	13,841	4,023	40	37	34
2004	15,550	5,803	51	50	47
2005	17,678	8,045	63	64	63
2006	20,219	10,743	74	79	81
2007	23,139	13,845	85	93	101
2008	26,337	17,245	94	107	122
2009	29,680	20,799	101	118	143
2010	32,944	24,307	106	127	164

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

**KWAZULU-NATAL****BUDGETING FOR THE PROVISION OF SOCIAL SECURITY**

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	4,074,655	4,686,829	5,416,976	6,004,205	6,572,767
Real increase			14.57%	9.58%	8.00%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

**EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS**

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	552,064	20,653	10,314	R 87,211,744	R 1,046,540,925	
Scenario 1: CSG and CDG	1,217,611	20,653	11,512	R 187,333,284	R 2,247,999,402	22.2%
Scenario 2: FCG and CDG	1,159,693	57,918	11,512	R 196,366,848	R 2,356,402,171	24.2%

Source: 1 Department of Social Development: SOCPEN database

**ASSA2000 ORPHAN PROJECTIONS**

Population aged 0-18 (June 2002)<sup>1</sup>: 4,058,702

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	131,972	11,792	225	166	
1998	140,211	20,693	358	274	
1999	152,830	34,484	538	431	
2000	171,380	54,721	765	643	
2001	197,237	82,886	1,032	912	
2002	231,672	120,167	1,326	1,235	1,198
2003	275,306	167,121	1,630	1,599	1,601
2004	327,758	223,424	1,920	1,980	2,061
2005	387,812	287,668	2,172	2,348	2,562
2006	453,074	357,314	2,368	2,672	3,084
2007	520,504	429,012	2,499	2,924	3,603
2008	586,198	498,783	2,566	3,091	4,098
2009	646,426	562,798	2,577	3,172	4,545
2010	696,066	616,462	2,548	3,178	4,925

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

## WESTERN CAPE

### BUDGETING FOR THE PROVISION OF SOCIAL SECURITY

	2000/01	2001/02	2002/03	2003/04	2004/05
	Actual Expenditure R'000	Estimated Actual Expenditure R'000	Medium Term Expenditure Estimates		
			R'000	R'000	R'000
Social security	1,810,241	1,955,698	2,287,639	2,502,525	2,717,416
Real increase			15.88%	8.31%	7.25%

Source: National Treasury 2002c

Values deflated using CPIX estimates quoted in National Treasury 2002a to obtain real increase

### EXPANDING SOCIAL ASSISTANCE FOR AIDS ORPHANS

	Number of beneficiaries			Total cost per month	Total cost per year	Required growth in budget
	CSG	FCG	CDG			
Child grants June 2002 <sup>(1)</sup>	176,737	19,382	3,967	R 34,124,424	R 409,493,092	
Scenario 1: CSG and CDG	475,658	19,382	4,031	R 78,088,039	R 937,056,473	23.1%
Scenario 2: FCG and CDG	463,298	12,361	4,031	R 73,127,714	R 877,532,568	20.5%

Source: 1 Department of Social Development: SOCPEN database

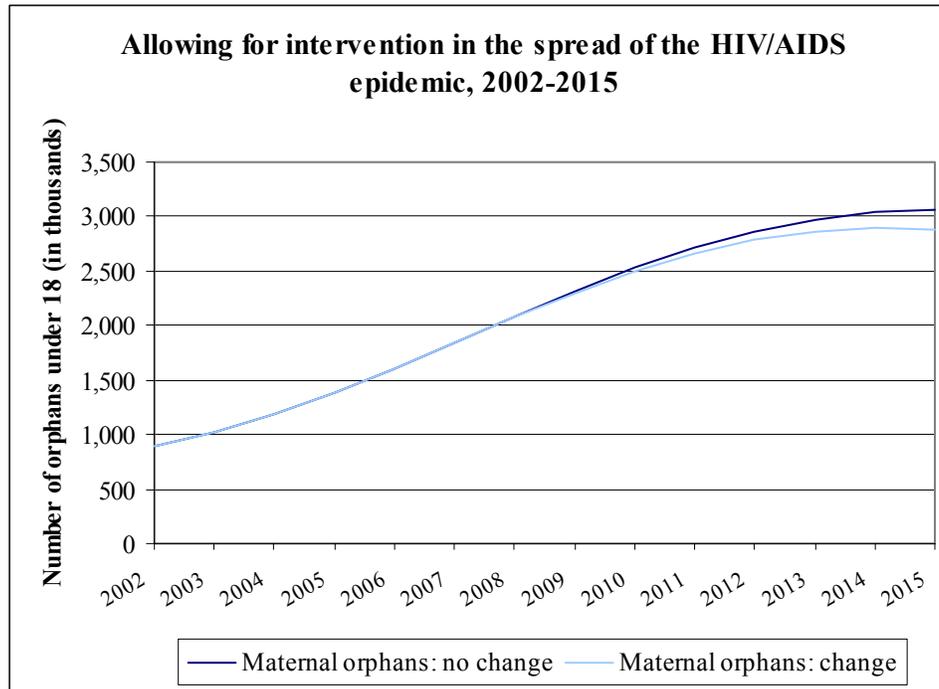
### ASSA2000 ORPHAN PROJECTIONS

Population aged 0-18 (June 2002)<sup>1</sup>: 1,585,528

Year	All orphans under 18 <sup>(2)</sup>	AIDS orphans under 18 <sup>(3)</sup>	New infections: perinatal <sup>(4)</sup>	New infections: mother's milk <sup>(5)</sup>	Orphans sick with AIDS
1997	39,246	448	10	7	
1998	40,532	872	17	13	
1999	42,144	1,604	26	21	
2000	44,068	2,771	40	33	
2001	46,440	4,551	57	49	
2002	49,442	7,133	79	71	64
2003	53,266	10,706	104	97	91
2004	57,997	15,427	131	128	125
2005	63,839	21,413	160	163	164
2006	70,763	28,657	187	198	209
2007	78,701	37,056	211	232	258
2008	87,410	46,349	229	263	308
2009	96,533	56,154	242	287	358
2010	105,400	65,855	248	303	405

Sources: 1 Department of Social Development: SOCPEN database

2-5 ASSA2000 projections generated by author on 6 Jan 2003

**APPENDIX II: THE IMPACT OF HIV/AIDS INTERVENTIONS ON ORPHAN NUMBERS**

Source: ASSA2000 Orphan projections generated by the author in January 2003

**APPENDIX III: ALLOWING FOR HIV PREVENTION ACTIVITIES IN COMPUTING THE COST OF PROVIDING A SOCIAL SAFETY NET FOR ORPHANS**

Population under 18<sup>(1)</sup>: 18,860,713

Year	NO CHANGE							
	Total orphans	Total AIDS orphans	New infections: perinatal	New infections: mother's milk	Cost of FCG	Cost of CSG	Cost of CDG	Total cost of care: no change
1997	575,895	29,292	564	414				
1998	605,059	53,115	915	699				
1999	648,503	91,374	1,386	1,107				
2000	706,535	148,578	2,005	1,676				
2001	785,806	230,359	2,757	2,419				
2002	891,377	341,592	3,617	3,333	R 1,230,100,429	R 9,131,420,916	R 24,349,737	R 10,385,871,082
2003	1,026,898	485,722	4,544	4,398	R 1,417,118,560	R 9,074,502,354	R 33,144,834	R 10,524,765,748
2004	1,192,700	663,683	5,484	5,565	R 1,645,926,260	R 9,004,865,228	R 43,403,479	R 10,694,194,967
2005	1,388,060	873,797	6,370	6,760	R 1,915,522,260	R 8,922,814,271	R 54,990,346	R 10,893,326,877
2006	1,607,535	1,110,204	7,143	7,895	R 2,218,398,331	R 8,830,634,598	R 67,500,077	R 11,116,533,006
2007	1,844,078	1,364,379	7,758	8,889	R 2,544,827,067	R 8,731,286,722	R 80,461,704	R 11,356,575,492
2008	2,086,069	1,624,321	8,194	9,677	R 2,878,775,458	R 8,629,650,255	R 93,362,983	R 11,601,788,695
2009	2,321,052	1,877,073	8,455	10,227	R 3,203,051,598	R 8,530,957,516	R 105,669,519	R 11,839,678,633
2010	2,529,583	2,105,607	8,563	10,541	R 3,490,824,690	R 8,443,374,402	R 116,843,850	R 12,051,042,941
2011	2,713,438	2,306,883	8,555	10,650	R 3,744,543,816	R 8,366,155,537	R 126,398,867	R 12,237,098,220
2012	2,860,050	2,470,371	8,470	10,603	R 3,946,869,413	R 8,304,578,181	R 133,968,050	R 12,385,415,644
2013	2,966,972	2,593,371	8,343	10,454	R 4,094,421,795	R 8,259,670,935	R 139,365,697	R 12,493,458,427
2014	3,035,713	2,677,090	8,202	10,251	R 4,189,283,970	R 8,230,799,838	R 142,616,406	R 12,562,700,214
2015	3,070,475	2,725,490	8,067	10,031	R 4,237,256,179	R 8,216,199,600	R 143,946,726	R 12,597,402,505

Year	CHANGE SCENARIO							
	Total orphans	Total AIDS orphans	New infections: perinatal	New infections: mother's milk	Cost of FCG	Cost of CSG	Cost of CDG	Total cost of care: change scenario
1997			564	414				
1998			915	699				
1999			1,386	1,107				
2000			2,005	1,676				
2001			2,757	2,419				
2002	891,377	341,592	3,616	3,333	R 1,230,100,429	R 9,131,420,916	R 24,349,737	R 10,385,871,082
2003	1,026,893	485,625	4,541	4,397	R 1,417,112,934	R 9,074,504,066	R 33,140,574	R 10,524,757,573
2004	1,192,638	663,279	5,473	5,559	R 1,645,840,914	R 9,004,891,203	R 43,381,038	R 10,694,113,155
2005	1,387,707	872,655	6,338	6,741	R 1,915,035,405	R 8,922,962,445	R 54,906,577	R 10,892,904,427
2006	1,606,250	1,107,470	7,063	7,845	R 2,216,624,900	R 8,831,174,337	R 67,249,461	R 11,115,048,699
2007	1,840,495	1,358,467	7,602	8,785	R 2,539,882,910	R 8,732,791,465	R 79,843,089	R 11,352,517,463
2008	2,078,068	1,612,938	7,921	9,483	R 2,867,733,948	R 8,633,010,714	R 92,150,015	R 11,592,894,677
2009	2,305,427	1,856,887	8,017	9,893	R 3,181,489,304	R 8,537,519,954	R 103,527,944	R 11,822,537,202
2010	2,501,865	2,072,068	7,916	10,011	R 3,452,573,401	R 8,455,016,098	R 113,343,567	R 12,020,933,066
2011	2,667,867	2,254,172	7,665	9,869	R 3,681,656,039	R 8,385,295,295	R 121,049,187	R 12,188,000,521
2012	2,789,973	2,391,812	7,315	9,523	R 3,850,162,757	R 8,334,010,642	R 126,335,369	R 12,310,508,768
2013	2,865,270	2,481,847	6,926	9,049	R 3,954,072,738	R 8,302,385,865	R 129,004,437	R 12,385,463,041
2014	2,895,692	2,525,931	6,550	8,526	R 3,996,054,948	R 8,289,608,671	R 129,168,829	R 12,414,832,448
2015	2,886,863	2,529,464	6,226	8,022	R 3,983,871,214	R 8,293,316,764	R 127,187,027	R 12,404,375,004