

# Financing the Welfare Needs of Children Affected by HIV/AIDS: The Case of Brazil

Amy Nunn and Francisco I. Bastos

## 1 Introduction

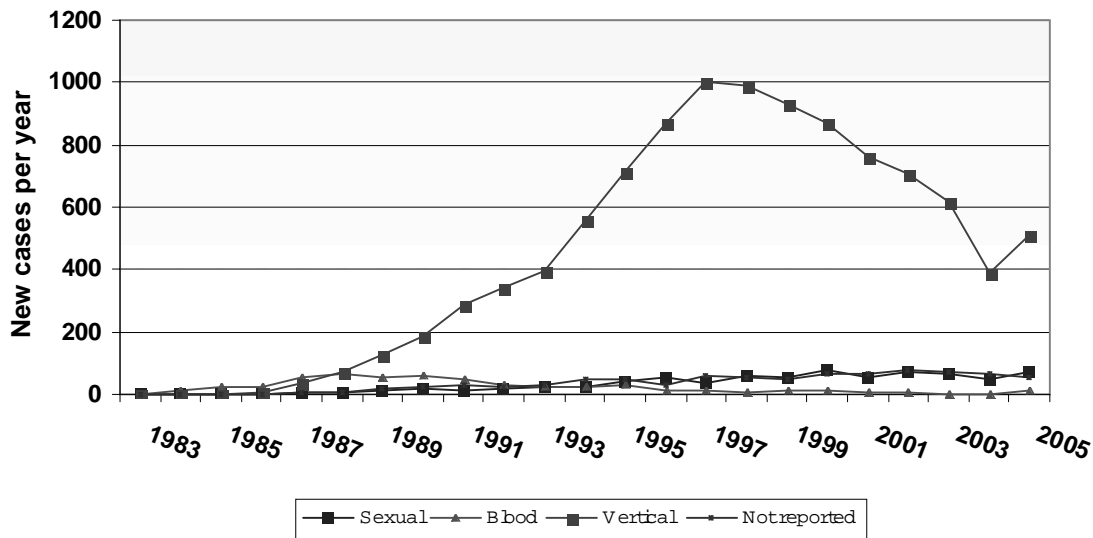
In Brazil as elsewhere, most children who live with HIV are infected by mother-to-child (hereafter vertical) transmission. Although vertical transmission of HIV is preventable with existing testing and treatment technologies, and transmission in this way has dropped to less than 2 per cent in most developed countries, only approximately 5–10 per cent of all women in developing countries have access to preventing mother-to-child transmission (PMTCT) (Prendergast *et al.* 2007; UNAIDS 2006a). In the absence of any intervention, the probability that women pass HIV to their infants is approximately 15–30 per cent in developed countries but 25–40 per cent in sub-Saharan Africa (Prendergast *et al.* 2007; Connor *et al.* 1994; Italian Multicentre Study 1988). Without interventions, approximately 66 per cent of vertical transmission takes place in the peripartum<sup>1</sup> period. Most peripartum transmission (66 per cent) takes place during childbirth and a third of cases take place in utero, usually during the last trimester of pregnancy (Prendergast *et al.* 2007). Much of the remainder is attributable to postpartum and longer-term breastfeeding. However, the risk of vertical transmission of HIV can be radically reduced by providing highly active antiretroviral therapy (HAART) to HIV-positive pregnant women before childbirth and to their infants for several weeks after birth (Prendergast *et al.* 2007; Tonwe-Gold *et al.* 2007). Since most children who are infected with HIV are infected by their mothers, the single most effective way to address the paediatric HIV/AIDS epidemic is to prevent vertical transmission of HIV (Prendergast *et al.* 2007).

Preventing vertical transmission of HIV and responding to the health and welfare needs of

children living with and affected by HIV/AIDS requires significant resources as well as a robust political commitment. As a result of its policies to provide pregnant women and their newborns with prophylactic HAART, Brazil has successfully reduced vertical transmission of HIV/AIDS in recent years (Figure 1). However, much less is known about the welfare of children orphaned by AIDS in Brazil and Latin America more broadly. Although a 2000 study estimates that 32,000 children have been orphaned as a result of the AIDS epidemic in Brazil (Szwarcwald *et al.* 2000), few studies since have examined either the social or medical needs of children infected and affected by HIV/AIDS. Other research has attempted to update the estimates on AIDS orphans (França Junior *et al.* 2006), but the conclusions of recent studies have been somewhat limited by the paucity of information on paediatric HIV/AIDS and AIDS orphans in Brazil.

This article appraises the available evidence to answer the question: 'Can a developing country support the welfare needs of children affected by AIDS?', for the case of Brazil. Based on the Brazilian experience, we argue that a developing country can indeed take proactive steps to support the welfare needs of children affected by HIV/AIDS. We hold that irrespective of some uncertainties about the welfare of children living with HIV/AIDS, Brazil's commitments to policies supporting these children are best demonstrated by the country's success in dramatically reducing vertical transmission of HIV. In turn, we attribute Brazil's success in reducing vertical transmission of HIV to its long-standing political commitments to AIDS treatment, including prophylactic antiretroviral therapy, which the country

Figure 1 New AIDS cases for children under 13 in Brazil by type of HIV transmission (1983–2005)



Source National STD and AIDS Program of Brazil (2007).

adopted over the objections of international donors in the 1990s. Although Brazil supplemented development of its HIV/AIDS programmes with World Bank loans, the interventions which have had the most demonstrable impact on child welfare, including providing widespread access to HAART for pregnant women and their infants, have been wholly financed with local resources. This demonstrates Brazil's commitment and proactive, effective response to addressing the welfare needs of children affected and infected by HIV/AIDS.

## 2 The HIV/AIDS epidemic in Brazil

Brazil has a concentrated AIDS epidemic. HIV prevalence in Brazil among the general population is approximately five per 1,000 inhabitants (or 0.5 per cent), which amounts to approximately 660,000 individuals. HIV prevalence is often higher than 5 per cent in vulnerable subpopulations, such as injecting drug users (IDUs), commercial sex workers and the urban poor (Fonseca and Bastos 2007; Dourado *et al.* 2006). In spite of the increasing feminisation of the AIDS epidemic in Brazil, during the last decade the epidemic there has generally stabilised as incidence rates levelled off in the industrialised, urban south-east, where the epidemic has historically been concentrated. In contrast with sub-Saharan Africa, Brazil's AIDS epidemic remains a largely urban

phenomenon; HIV prevalence in rural areas throughout Brazil remains very low (Petersen *et al.* 2006). AIDS prevalence and incidence continues to rise in the North-east region of Brazil as well as among other vulnerable populations, such as in homosexual men, the urban poor and IDUs (Dourado *et al.* 2006; Hacker *et al.* 2006).

Recent estimates, based on the regular surveillance of women attending prenatal clinics and maternities, document HIV prevalence in Brazil as less than 0.5 per 1,000 (Szwarcwald *et al.* 2006), with slight regional variation (Szwarcwald *et al.* 2000). This overall low prevalence, coupled with the fact that the epidemic has been concentrated among vulnerable populations, such as IDUs (most of whom are male in Brazil), homosexual men, and hemophiliacs, has resulted in relatively low HIV prevalence among women of reproductive health age (Fonseca and Bastos 2007; Bastos *et al.* 2008). Despite the progressive increase in the number of women affected by the AIDS epidemic, relatively low prevalence of HIV among women of reproductive health age is an important factor influencing Brazil's relatively low rates of vertical transmission of HIV, and in turn, Brazil's relatively low prevalence of paediatric AIDS.

### 3 AIDS policy in Brazil

Brazil, a middle-income country with relatively well-developed health infrastructure, is known for its effective response to the AIDS epidemic. A social movement for HIV/AIDS prompted early progressive public responses to the HIV/AIDS epidemic, and Brazil was the first developing country to begin treating AIDS patients in its public health system in 1991 (Nunn 2009, in press). Since 1996, over the objections of the World Bank and other major donors, Brazil has provided free and universal access to antiretroviral drugs for treating People Living with HIV/AIDS (PLWHA). Although Brazil has accepted US\$425 million in World Bank loans for developing AIDS programmes since 1994, the terms of these loans have explicitly forbidden Brazil to use the funds to finance drugs for AIDS treatment, including drugs to prevent vertical transmission of HIV (World Bank 1993, 1998, 2003).

Since the early 1990s, Brazil has prioritised both treatment and prevention of HIV/AIDS. Working around World Bank loan restrictions, Brazil used World Bank funds to subsidise health infrastructure development, capacity building for medical professionals, epidemiological surveillance, and partnerships with civil society organisations (Nunn 2009, in press). However, Brazil has always locally financed drugs for treatment, including drugs to prevent vertical transmission of HIV, out of the federal local health ministry budget. HAART is now offered in hundreds of clinics throughout the country; Brazil scaled-up HAART from approximately 35,000 to 180,000 PLWHA during 1997–2007. In 2007, approximately 7,150 children received HAART.

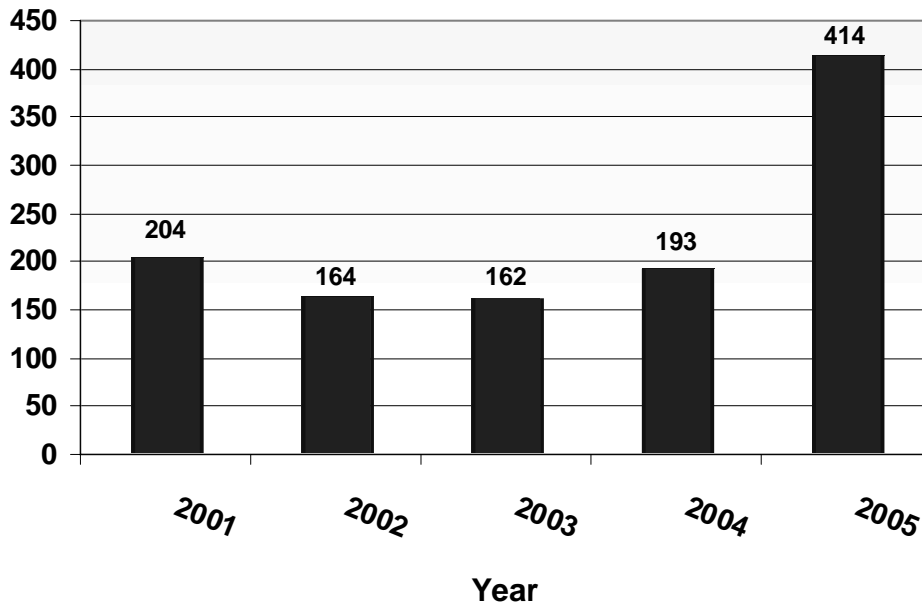
Brazil's treatment guidelines are based on the most current clinical evidence available and include comprehensive policies to treat all people living with HIV/AIDS, including special populations such as children and adolescents, pregnant women, IDUs, and individuals co-infected with tuberculosis and hepatitis. Critical components of Brazil's treatment guidelines include voluntary counselling and HIV testing for all pregnant women receiving antenatal care in public sector health clinics, policies to treat HIV-infected women with HAART, and policies to reduce the likelihood of vertical transmission of HIV/AIDS during and after childbirth with prophylactic administration of select antiretroviral drugs to both mother and infant (Ministério de Saúde 2006; Programa Nacional de DST e Aids 2007).<sup>2</sup>

As a result of these policies, AIDS-related morbidity and mortality have declined dramatically (Guimarães 2000, Teixeira *et al.* 2004; Marins *et al.* 2003), and vertical transmission of HIV/AIDS has become rare in Brazil (Ministério de Saúde 2006; Guimarães 2000). These policies have won international acclaim from a variety of different global health institutions, and Brazil now offers important lessons for other countries scaling-up AIDS treatment, particularly middle-income countries with health infrastructure and concentrated AIDS epidemics (Acejias *et al.* 2007; Wools-Kaloustian and Kimaiyo 2006).

Other than a study that documents the cost of the antiretroviral drugs for Brazil's AIDS treatment programmes (Nunn *et al.* 2007), little has been written about the aggregate costs of Brazil's HIV/AIDS programmes and interventions. We note, however, that during the last five years, local spending on HIV/AIDS, and particularly AIDS treatment, has far surpassed donor aid for HIV/AIDS in Brazil. Although aggregate AIDS programme expenditures were not available, Figure 2 highlights Brazil's local expenditures on antiretroviral drugs in the years 2001–5, which totalled over US\$1.1 billion. In 2005, the last year for which data were available, the Brazilian Ministry of Health (BMoH) spent approximately US\$414 million of its budget on antiretroviral drugs; this sum alone approaches the US\$450 million in World Bank loan support over more than a decade in Brazil. Though these might be considered relatively large sums for drug expenditures for one disease in a developing country, Brazil's total spending on drugs for HAART has never amounted to more than 2 per cent of its now nearly US\$20 billion federal public health budget (Nunn *et al.* 2007). From available data, it is unclear precisely how much Brazil has spent on reducing vertical transmission of AIDS, paediatric AIDS treatment, and welfare programmes for children affected by HIV/AIDS; however, it is clear that these types of programmes were generally beyond the scope of programmes funded by World Bank loans and have been financed domestically rather than by international donors. Although costs of Brazil's programmes have risen in recent years, Brazil's political commitments to addressing the HIV/AIDS epidemic are robust and unwavering; rising costs are unlikely to threaten the sustainability of its programmes.

One of the remarkable impacts of Brazil's treatment policies is the relatively low prevalence of paediatric

Figure 2 Total cost of antiretroviral drugs in Brazil (2001–5)



Source Nunn *et al.* (2009, in press).

HIV/AIDS which, in turn, has reduced the health and economic challenges associated with meeting the welfare needs of children affected and infected by HIV/AIDS. Drugs costs for HAART alone average US\$2,500 per person per year in Brazil (Nunn *et al.* 2007), and aggregate health costs associated with the treatment and care of PLWHA probably far surpass this sum. Preventing vertical transmission of HIV has been far less expensive than the treatment, hospitalisation and social programme costs Brazil would have faced in the absence of interventions to prevent vertical transmission of HIV/AIDS.

We acknowledge that challenges in addressing the welfare needs of children in other low- and middle-income countries are compounded by higher HIV prevalence, more fragmentary health infrastructure, and insufficient health budgets. However, we posit that the key reason Brazil faces relatively few challenges associated with meeting the welfare needs of children affected by AIDS is the fact that the country developed an early, home-grown and effective response to the HIV/AIDS epidemic.

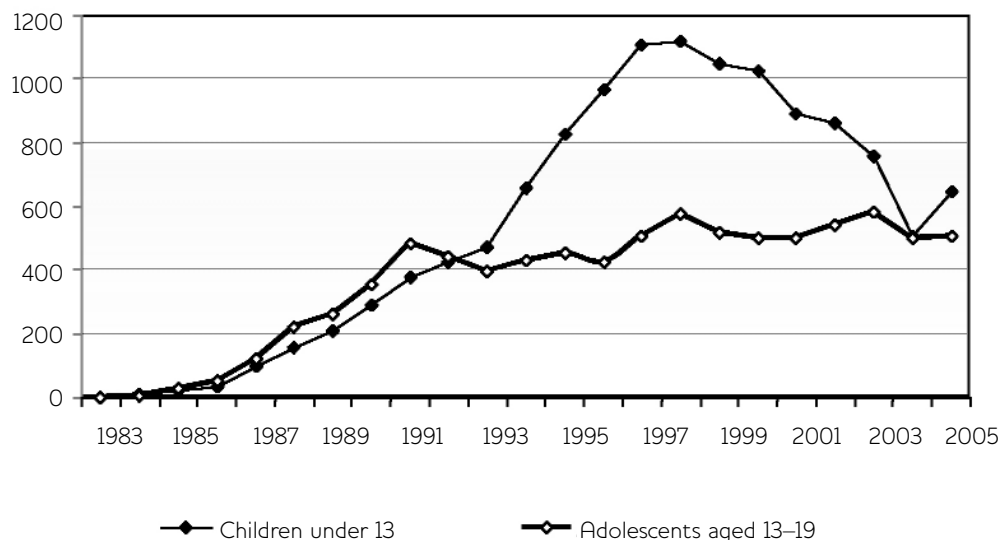
We now turn to the health evidence that supports these claims.

#### 4 Vertical transmission of HIV and prevalence of paediatric and adolescent HIV/AIDS in Brazil

Vertical transmission of HIV has declined in many Latin American and Caribbean countries in recent years. A recent study attributed the less than 1 per cent rate of vertical transmission in four countries from Latin America and the Caribbean (including Brazil, Argentina, Mexico and the Bahamas) to the successful implementation of antiretroviral treatment and timely antiretroviral prophylaxis for HIV-positive pregnant women (Read *et al.* 2007). Recent research in Brazil also addresses the major achievements with providing prophylactic antiretroviral therapy to prevent vertical transmission of HIV as well as challenges with scaling-up voluntary HIV testing and HIV prophylaxis in Brazil's more remote regions (Matida *et al.* 2005; Souza-Junior *et al.* 2002; de Brito *et al.* 2006).

From 1980 to 2005, approximately 10,400 Brazilian AIDS cases were registered among children under five; 3,905 cases were registered among those aged 5–12; and 8,075 were registered among those aged 13–19<sup>3</sup> (França Junior *et al.* 2006). The most recent data from Brazil's Sentinel Surveillance Program estimates that HIV prevalence among all women

**Figure 3 AIDS cases among children and adolescents in Brazil (1983–2005)**



Source National STD and AIDS Program of Brazil (2007).

delivering in public hospitals in Brazil is less than 1 per cent, with relatively modest variation by geographic region in Brazil (Programa Nacional de DST e Aids 2007).

Most AIDS cases among children under 13 years in Brazil are attributable to vertical transmission of HIV (Figure 1). The stabilisation of the AIDS epidemic since the late 1990s and Brazil's policies of providing prophylactic antiretroviral therapy to HIV-positive mothers just before childbirth have resulted in a precipitous decline in the number of children aged five years old or younger diagnosed with HIV. According to data from Brazil's sentinel surveillance system, the number of new AIDS cases for children under five peaked in 1997 (Figure 3).<sup>4</sup> Vertical transmission of HIV decreased from 16 per cent to 7 per cent for HIV-positive women receiving prenatal care in Brazil's public health system between 1997 and 2002 (de Brito *et al.* 2006). The number of AIDS cases among adolescents aged 13–19 has remained relatively stable since the mid-1990s (Figure 3).

In spite of Brazil's relatively low rates of HIV transmission, the National Sexually Transmitted Disease (STD) and AIDS Program of Brazil estimates that only 63 per cent of women who delivered in public clinics had access to voluntary testing and HIV

prophylaxis prior to childbirth (Ministério de Saúde 2006; Programa Nacional de DST e Aids 2007). Other related studies found that women who lived in urban areas and women of higher educational strata reported dramatically higher rates of than their counterparts in rural areas and of lower socioeconomic status. For example, only 19 per cent of illiterate women had access to counselling, testing and the appropriate prophylactic antiretroviral regimens to prevent HIV, versus 64 per cent of women who had completed eighth grade (Marins *et al.* 2003).

In response to these challenges, BMoH recently implemented a programme that requires compulsory reporting for all pregnant women who test HIV positive; implemented policies to reduce congenital syphilis (which affects approximately 2 per cent of women giving birth in public hospitals in Brazil) (Ramos *et al.* 2007; Rodrigues 2004); and instituted programmes to prevent vertical transmission of HIV in all public health clinics in Brazil's national health system, the Sistema Único de Saúde (SUS). Compulsory reporting of HIV for pregnant women replaced the previous surveillance strategy, which only required reporting of AIDS cases (Ministério de Saúde 2006; Programa Nacional de DST e Aids 2007).

In spite of the aforementioned challenges associated with access to HIV testing and prophylaxis for pregnant women, vertical transmission of HIV remains relatively low in Brazil, most likely because access to essential testing and treatment technologies is relatively stable in the south and south-east regions, which have the highest HIV prevalence. São Paulo, for example, constitutes 25 per cent of the Brazilian population and represents 50 per cent of all AIDS cases in Brazil. In São Paulo, an estimated 85 per cent of women receive comprehensive prenatal care, including HIV testing, counselling and requisite prophylaxis to prevent vertical transmission of HIV. For women who have not received antenatal care (an estimated 12 per cent of all women delivering in São Paulo), the São Paulo state health ministry administers rapid HIV tests just prior to childbirth in order to determine whether to administer HAART prophylactically (Matida *et al.* 2005). This suggests that the unmet need for HIV testing necessary to prevent vertical transmission of HIV is quite low in São Paulo, the Brazilian state with the highest prevalence of HIV. However, the decline in rates of vertical HIV transmission has been less pronounced in the less-developed regions of the country, with more fragmentary health infrastructure, including the north and north-eastern regions (Acejias *et al.* 2007).

In addition to its policies of preventing vertical transmission of HIV, Brazil offers HAART to all children and adolescents living with HIV/AIDS. In 2007, approximately 7,150 children and adolescents were receiving HAART in Brazil's public health system. Although life expectancy for adults living with HIV/AIDS has improved dramatically as a result of free and universal access to HAART (Bastos *et al.* 2008; Marins *et al.* 2003), less is known about the survival impacts of providing HAART to children in Brazil. To date, only one small study of less than 400 patients has examined AIDS-related morbidity and mortality trends among children in Brazil. The study finds that the risk of morbidity and mortality overwhelmingly declined for HIV-positive children taking HAART (Candiani *et al.* 2007). To date, no study has systematically examined the population impacts of providing free and universal access to treatment on the survival of children and adolescents living with HIV/AIDS in Brazil. Nevertheless, HAART generally is associated with delayed onset of AIDS and improved life expectancy, and has likely reduced AIDS-related morbidity and mortality among the

population of children and adolescents living with HIV/AIDS in Brazil (Souza-Junior *et al.* 2002).

Only one study has examined the costs of paediatric AIDS treatment in Brazil. The small study of approximately 300 children, conducted in one of Brazil's best specialty hospitals, finds that the average cost of drugs for HIV prophylaxis to prevent vertical transmission of HIV averaged approximately US\$500 per child, while the cost of drugs for treating a child living with HIV/AIDS averaged approximately US\$4,000. Average costs of hospitalisation for HIV-positive children were in the range of US\$450–10,000 per child, depending on the child's health state at the time of admission (Marques *et al.* 2007). These costs may not be representative of broader trends or standards of clinical care in greater Brazil, but do provide some preliminary insight into the costs associated with treating children living with HIV/AIDS. These costs are not excessive for Brazil, which spends nearly US\$20 billion annually on health programmes and approximately US\$600 *per capita* on health expenditures, but might be out of the realm of possibility for other developing countries with higher HIV prevalence and greater budget constraints.

### **5 Prevalence of orphans due to AIDS in Brazil and the policy response**

Perhaps because of Brazil's relatively low prevalence of paediatric HIV/AIDS, the literature on both the prevalence and welfare related to AIDS orphans in Brazil is sparse. We nevertheless discuss the available information and its implications for assessing the Brazilian policy response to addressing the welfare needs of children affected by AIDS.

It is not known precisely how many AIDS orphans live in Brazil today (Doring *et al.* 2005). Using mathematical models, in 2000 Szwarcwald and co-workers estimated that 30,000 children were orphaned in Brazil due to maternal AIDS during 1987–99 (Szwarcwald *et al.* 2000). Other studies reviewed by França Junior *et al.* (2006) used alternative methods to estimate the number of AIDS orphans in Brazil, but the accuracy of the estimates have been somewhat compromised by data limitations.

In perhaps the best formal study carried out to date on AIDS orphans in Brazil, a 2005 article estimates the number of orphans in Rio Grande do Sul, a well-developed state in southern Brazil. The authors found

that 1,131 orphans (defined as the loss of either one or both of their parents) aged 0–14 were living in the capital, Porto Alegre, in the period 1998–2001. The city's AIDS prevalence ranks third highest in the country, after São Paulo and Rio de Janeiro (Doring *et al.* 2005). While this study may not represent broader Brazilian trends, it does provide some insight into the public policy response to the welfare needs of children affected and infected with HIV in a Brazilian state with relatively high HIV/AIDS prevalence.

The study, based on household surveys of AIDS orphans, finds that informal networks of relatives and friends have been equally important in addressing orphans' social needs. Of the orphans interviewed for the study, approximately 95 per cent were not living in orphanages or public institutions at the time of the survey. Half the orphans were living with their extended families; one-quarter lived with their other parent, and another quarter lived with relatives, friends and neighbours in informal arrangements. Nearly 75 per cent of the orphans reported receiving counselling and testing for HIV, and HIV prevalence was 9 per cent among all orphans who had been tested (Doring *et al.* 2005).

This first study suggests that informal networks of relatives and friends who received minimal or no financial or social support from the state have been a fundamental component of support systems for orphans. Although UNAIDS recommends avoiding institutionalisation of AIDS orphans when stable networks of families and friends are available (UNAIDS 2006b), the only study on the welfare of AIDS orphans in Brazil suggests that improving public infrastructure to address orphans' social needs might bolster existing efforts, particularly since the study reports that orphans face significant problems with social marginalisation and stigma (Doring *et al.* 2005). Using Bolsa Família, Brazil's direct cash transfer programme for families living in abject poverty, might be an important outlet for initial outreach efforts.

To date, no research has examined non-orphan children affected by HIV/AIDS in Brazil. Further research is needed to examine the social and welfare needs of AIDS orphans in Brazil outside of Rio

Grande do Sul, as well as non-orphaned children made vulnerable by HIV/AIDS in greater Brazil. Because most orphans are from low socioeconomic strata, these studies should be situated in the context of poverty and social exclusion.

## 6 Conclusions

We conclude that the impact of AIDS on Brazilian children has been largely mitigated by the timely implementation of measures to prevent vertical HIV transmission. To date, little is known about the health and social welfare of children affected and infected by HIV/AIDS; the small number of paediatric AIDS cases in Brazil have resulted in relatively little scientific research related to the welfare of children affected and infected by HIV/AIDS in Brazil. However, the Brazilian government has committed to providing free and universal access to AIDS treatment for all children living with HIV, has implemented health infrastructure towards that end, and currently treats over 7,000 children living with HIV/AIDS.

By using World Bank loans to subsidise AIDS programmes and health infrastructure development while locally financing the drugs necessary for treating AIDS and the prevention of vertical HIV transmission, Brazil has successfully mitigated the impact of the HIV/AIDS epidemic on children. Although no studies have explicitly examined the macroeconomic impacts of World Bank loans for HIV/AIDS in Brazil, with an economy of over US\$1 trillion and annual public health spending of approximately US\$20 billion, foreign aid related to HIV/AIDS in Brazil seems not to have distorted Brazil's economic development or national health programmes. Brazil, with relatively well-developed health infrastructure, low HIV prevalence, progressive public policy responses to the AIDS epidemic, early receipt of foreign aid for HIV/AIDS, a large economy, and a large health portfolio undistorted by foreign aid, is an exceptional case of a developing country response to HIV/AIDS. We nevertheless conclude that by largely preventing vertical transmission of HIV/AIDS, and disregarding donor advice about prioritising prevention over AIDS treatment, Brazil has successfully avoided what could have been a major public health crisis related to paediatric HIV/AIDS.

## Notes

- 1 Peripartum refers to the time before, during or just after delivery.
- 2 We do not explore the clinical guidelines in detail in this article. However, these newly updated guidelines are available in a report published by the National STD and AIDS Program of Brazil (Programa Nacional de DST e Aids 2007).
- 3 Brazil defines children as those aged 1–12 and adolescents as those aged 13–19. In this article, we differentiate our analyses in this way.

- 4 Epidemiologists debate why paediatric AIDS cases increased slightly after 2003. The slight increase may either reflect a true increase in paediatric AIDS due to increased incidence in select geographic regions, or may be a consequence of improved surveillance and case reporting. These estimates are currently under study by the National STD and AIDS Program of Brazil.

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