

Alexandre Grangeiro^I

Luciana Teixeira^{II}

Francisco I. Bastos^{III}

Paulo Teixeira^{IV}

Sustainability of Brazilian policy for access to antiretroviral drugs

ABSTRACT

OBJECTIVE: The expense of acquiring antiretroviral drugs in Brazil has given rise to debate about the sustainability of the policy of universal access to AIDS medications, despite the evident benefits. The objective of this study was to analyze the evolution of the Ministry of Health's spending on acquiring antiretroviral drugs from 1998 to 2005, the determining factors and the medium-term sustainability of this policy (2006-2008).

METHODS: The study on the evolution of spending on antiretrovirals included analysis of their prices, the year-by-year expenditure, the number of patients utilizing the medication, the mean expenditure per patient and the strategies for reducing the prices maintained during this period. To analyze the sustainability of the policy for access to antiretrovirals, the cost of acquiring the drugs over the period from 2006 to 2008 was estimated, along with the proportion of gross domestic product and federal health expenditure represented by this spending. The data were collected from the Ministry of Health, the Brazilian Institute for Geography and Statistics (IBGE) and the Ministry of Planning.

RESULTS: The expenditure on antiretrovirals increased by 66% in 2005, breaking the declining trend observed over the period from 2000 to 2004. The main factors associated with this increase were the weakening of the national generics industry and the unsatisfactory results from the process of negotiating with pharmaceutical companies.

CONCLUSIONS: The Brazilian policy for universal access is unsustainable at the present growth rates of the gross domestic product, unless the country compromises its investments in other fields.

KEYWORDS: Anti-HIV agents, economics. Anti-HIV agentes, supply & distribuion. Health policy, economics. National health programs, economics. Health expenditures, statistics & numerical data. Health care costs. Drug costs. Socioeconomic planning. Economics, pharmaceutical. Brazil.

^I Instituto de Saúde. Secretaria de Estado da Saúde. São Paulo, SP, Brasil

^{II} Departamento de Economia. Universidade de Brasília. Brasília, DF, Brasil

^{III} Departamento de Informações em Saúde. Centro de Informação Científica e Tecnológica. Fundação Oswaldo Cruz, Rio de Janeiro, RJ, Brasil

^{IV} Coordenadoria de Ciência, Tecnologia e Insumo Estratégico. Secretaria de Estado da Saúde. São Paulo, SP, Brasil

Correspondence:

Alexandre Grangeiro
Instituto de Saúde
Rua Santo Antonio, 590
01314-000 São Paulo, Brasil
E-mail: grangeiro@isaude.sp.gov.br

INTRODUCTION

The Declaration on HIV and AIDS* adopted at the Special Session of the United Nations that was held in New York in July 2001 established as one of its principles that people living with HIV and AIDS should have access to antiretroviral drugs. In the chapter "Care, Support and Treatment", countries took on the commitment to create national strategies by the year 2003, to deal with and if possible overcome the various obstacles that affect the supply of these drugs. For 2005, countries were called on to make investments aimed at expanding care and access to drugs.

The adoption of these targets at a global level is important for reducing the impact of the epidemic, particularly in countries that present structural deficiencies and large-magnitude epidemics. According to the World Health Organization (WHO),** three million people die as a result of AIDS every year. Around 80% of them did not have the benefit of the drug therapies available. Although advances have taken place over the last few years, the situation in December 2005 in poor and developing countries was that, out of the 6.5 million individuals who required such treatment, only 1.3 million were receiving it.

WHO and the Joint United Nations Programme on HIV/AIDS (UNAIDS)** have identified the following barriers to expanding access to medications: countries' inadequate structures for offering health services; limited world capacity for drug production; insufficient financial resources for acquiring such medications; and the consequent damage to public health caused by inequality and social injustice. There have been estimates* that, for the period from 2005 to 2008, an additional US\$18 billion will be needed for meeting the demands for assistance and prevention relating to HIV/AIDS. For the year 2008 alone, the expenditure on antiretroviral drugs in medium and low-income countries is estimated as US\$5.2 billion.***

The Brazilian policy for access to antiretroviral drugs started to be implemented in 1991,**** offering the

drug zidovudine (AZT). Today, 16 drugs are available within the health system. Decisions on incorporating new antiretrovirals within the Brazilian National Health System (SUS) are made following technical analysis carried out by three advisory committees, which are also responsible for the recommendations for the use and monitoring of these medications.

Just as in developed countries and in the few other developing countries that have expanded access to antiretrovirals,***** the policy for universal access to medications in Brazil has generated unequivocal benefits.^{1,7,*****} These have occurred both within the collective sphere (through reducing the infectiousness of people living with HIV/AIDS, this contributes towards controlling the epidemic⁶), and at the individual level (through causing substantial increases in the survival and quality of life of people with HIV and AIDS).^{1,7,*****}

Other benefits that are still partial have been observed in relation to improvement of the structure and operation of the Brazilian health system. The AIDS program has functioned as a paradigm for how the Brazilian health system should operate with regard to awareness-raising campaigns, partnership with civil society, supply of materials and careful monitoring.⁵ From an economic point of view, it is undeniable that access to antiretrovirals has caused a reduction in the expenditure on hospitalization and therapeutic procedures. An estimate from the National STD/AIDS Program has indicated savings of more than US\$ 2 billion over the period from 1997 to 2003.⁷

Despite these results, people living with HIV and AIDS and non-governmental organizations (NGO) have warned that the sustainability of the policy of universal access is at risk, as a result of the progressive increase in expenditure on the acquisition of antiretrovirals. In 2005, the National Health Council recommended to that the Ministry of Health should adopt a system of compulsory licensing of imported medications, in order to reduce the spending resulting from this policy.*****

*United Nations. General Assembly. Declaration of commitment on HIV/AIDS. New York; 2001. Disponível em http://data.unaids.org/publications/irc-pub03/aidsdeclaration_en.pdf [acesso em 28 mar 2006]

**World Health Organization. Progress on global access to HIV antiretroviral therapy: a report on "3 by 5" and beyond. Geneva; 2006. Disponível em http://www.who.int/hiv/fullreport_en_highres.pdf [acesso em 28 mar 2006]

***UNAIDS (Joint United Nations Programme on HIV/AIDS). Aids epidemics update 2005. Geneva; 2005. Disponível em http://www.unaids.org/epi/2005/doc/EPIupdate2005_pdf_en/epi-update2005_en.pdf [acesso em 30 mar 2006]

****UNAIDS (Joint United Nations Programme on HIV/AIDS). Resource needs for a expanded response to Aids in low and middle-income countries. Geneva; 2005. Disponível em http://data.unaids.org/publications/irc-pub06/resourceneedsreport_en.pdf [acesso em 28 mar 2006]

*****Ministério da Saúde. Programa Nacional de DST e Aids. National Aids drug policies. Brasília (DF); 2001. Disponível em http://www.aids.gov.br/data/documents/storedDocuments/%7BB8EF5DAF-23AE-4891-AD36-1903553A3174%7D/%7B5BE607D2-8253-49E8-9E43-67ABF31E9A05%7D/National_AIDS_Drug_Policy.pdf [acesso em 29 mar 2006]

*****Ministério da Saúde. Programa Nacional de DST e Aids. Sistema de Monitoramento de Indicadores do Programa Nacional de DST/Aids - MONITORAIDS. Disponível em <http://aids.gov.br/monitoraids> [acesso em 30 mar 2006]

*****Ministério da Saúde. Conselho Nacional de Saúde. Resumo executivo da centésima quinquagésima sétima reunião ordinária do Conselho Nacional de Saúde. Brasília (DF); 2005. Disponível em <http://conselho.saude.gov.br/docs/resumoexecutivo157.doc> [acesso em 30 mar 2006]

The reasons for the increase in this spending are: the growth in the number of people with HIV/AIDS undergoing treatment; the emergence of viral resistance,⁵ which means that patients have to be treated using more expensive medications, the so-called second-line drugs; the incorporation of new drugs with higher prices than those that are already available in the therapeutic arsenal; the National Industrial Property Law, which restricts the production of generic versions of original medications that came onto the market after 1996; and the limited capacity of national industry to produce new generic medications in the event of the approval of a compulsory license.

The discussion on the sustainability of the Brazilian policy involves international questions, especially since the main raw material-producing countries adopted national legislation on intellectual property rights in the field of pharmaceuticals, in consonance with accords established within the context of the World Trade Organization. The expectation is that the adoption of these laws – especially by India, in 2005, and almost simultaneously by China – will limit the worldwide production of generics and produce an impact on the drug market, thus making it difficult to obtain reductions in the prices of these products in poor and developing countries.²

In this respect, the organization Médecins Sans Frontières^{2,5} has warned about the “crisis of second-line drugs”. According to this NGO, incorporation of therapeutic schemes using more expensive medications will have a financial impact on the access programs. Consequently, developing countries will have great difficulty in ensuring treatment for patients using these new products.

To respond to the problem of sustainability, the Brazilian government has adopted a variety of strategies,* among which: production of generic medications; price negotiations with pharmaceutical companies; alteration of the national legislation relating to compulsory licensing; and international action aimed at establishing a consensus that would define access to medications as a question of human rights. The solutions that may be adopted in Brazil will have relevance internationally and will serve as a reference for other developing countries.

Within this context, the objective of the present paper was to analyze the results from the Brazilian strategies for ensuring the sustainability of the policy for universal access to antiretrovirals. For this, the evolution of federal spending on the acquisition of these drugs was analyzed, along with the proportion of gross domestic product and federal health expenditure represented by this spending. In addition to this, the main challenges to the sustainability of this policy over the next three years were covered.

METHODS

To analyze the behavior of the Ministry of Health's spending on acquiring antiretrovirals over the period from 1998 to 2005, information was collected on drug prices, year-by-year expenditure and numbers of patients using antiretrovirals. The evolution of this spending was then correlated with the documented information from the National Program for STD/AIDS of the Ministry of Health regarding the incorporation of new drugs and the government strategies adopted for reducing the prices of these drugs, such as negotiations with pharmaceutical companies and national production of generic drugs.

The sustainability of the policy for universal access was assessed by considering the percentages of gross domestic product (GDP) and federal health expenditure utilized for purchasing antiretroviral drugs, year by year (1998-2005). The data analyzed were collected from the Brazilian Institute for Geography and Statistics (IBGE), with regard to GDP figures;** from the Public Health Budget Information System of the Ministry of Health (SIOPS);*** and from the Ministry of Planning, with regard to revenue and expenditure within the fiscal budget and relating to social security, for federal health spending.****

The medium-term sustainability of the policy for universal access was analyzed on the basis of estimates of the commitment of GDP and federal health expenditure to acquiring antiretrovirals, over the period from 2006 to 2008. Three scenarios were evaluated, starting from the hypotheses of GDP growth rates of 2%, 4% and 6% per year. These rates were also utilized for estimating federal health expenditure over the same period, taking into account constitutional

*Ministério da Saúde. Programa Nacional de DST e Aids. A sustentabilidade do acesso universal a anti-retrovirais no Brasil. Brasília (DF); 2005. Disponível em http://www.aids.gov.br/data/documents/storedDocuments/%7BB8EF5DAF-23AE-4891-AD36-1903553A3174%7D/%7B0938AD30-E212-4E08-AE96-7C96622C85A3%7D/Cons._nacional_sustentabilidade.doc [acesso em 1 abr 2006]

**Instituto Brasileiro de Geografia e Estatística - IBGE. Contas nacionais trimestrais. Indicadores de volume. Valores correntes. Disponível em <http://www.ibge.gov.br>. [acesso em 2 abr 2006]

***Ministério da Saúde. Sistema de Informações sobre Orçamentos Públicos em Saúde - SIOPS. Disponível em http://portal.saude.gov.br/portal/saude/area.cfm?id_area=381 [acesso em 3 abr 2006]

****Ministério do Planejamento. Evolução da receita e despesas: orçamento fiscal e da seguridade social. Brasília (DF); 2005. Disponível em http://www.planejamento.gov.br/arquivos_down/sof/estatistica/evolucao_rec_desp.ppt#533,1, Evolução das receitas e despesas [acesso em 3 abr 2006]

Table 1 - Annual expenditure by the Ministry of Health on the acquisition of antiretroviral drugs, numbers of patients undergoing treatment, and mean expenditure per patient. Brazil, 1998-2005.

Year	Expenditure (R\$, millions)	Numbers of patients using antiretrovirals	Expenditure per patient (R\$)
1998	346	55,600	6,223
1999	568	73,000	7,781
2000	557	87,500	6,366
2001	502	105,000	4,781
2002	496	119,300	4,158
2003	549	133,200	4,122
2004	594	147,500	4,027
2005	986	161,000	6,124

Source: Programa Nacional de DST e Aids/Secretaria de Vigilância em Saúde/Ministério da Saúde (SVS/MS)

determinations regarding this matter. Following this, the circumstances under which it would be possible to maintain the policy for universal access, without compromising other health actions and the fight against AIDS in Brazil, were verified.

To project the expenditure on antiretrovirals to the period between 2006 and 2008, the numbers of patients using antiretrovirals up to 2008 was estimated on the basis of simple linear regression, adjusted to the data from 1998 to 2005 (determination coefficient of 0.99%). This started from the presupposition that the stability in the rates of HIV prevalence and AIDS-related deaths that has been observed since 1998* will be maintained until 2008. The estimated numbers of patients were then multiplied by the mean expenditure on acquiring antiretrovirals per patient/year for 2005.

The potentially avoidable expenditure on acquiring antiretrovirals was then estimated for the years 2005 to 2008, by comparing the estimated figures in two situations. In the first, it was supposed that the expenditure trend would be maintained on the basis of the lowest mean value per patient in the historical series studies, i.e. the year 2004; and in the second, the expenditure was projected according to the parameters observed in 2005, when the expenditure started to increase again. The difference between the two estimates was considered to be potentially avoidable expenditure.

Finally, the economic impact of acquiring antiretrovirals on the actions of the National Program for STD/AIDS was assessed, by analyzing the commitment of the budget for this body to purchasing these drugs, and its commitment to carrying out programmed actions. Thus, it was possible to assess the capacity of the National Program to maintain and expand the national response to the HIV/AIDS epidemic, in the light of possible budget restrictions determined by the high proportion of the budget accounted for by drug purchases.

RESULTS

Evolution of spending on antiretroviral drugs and its determining factors

The Ministry of Health's spending on acquiring antiretroviral drugs (Table 1) almost tripled in nominal terms over the period from 1998 to 2005, going from R\$346 million** per year to R\$986 million per year. By observing the mean annual expenditure per patient, three distinct period could be identified. During the first period (1998 and 1999), the highest mean spending per patient of the whole series was seen, reaching R\$7,781 in 1999. In turn, the total expenditure on acquiring these drugs that year was 64% greater than what was seen in 1998.

During the second period (2000 to 2004), the beginnings of a decrease in spending per patient on purchasing AIDS medications were observed, followed by stabilization. Considering the increase in the number of new patients (74,500) and the inclusion of new drugs, the gradual decline in mean expenditure per patient reached the lowest figure for the whole period analyzed in 2004 (R\$4,027). Thus, the growth in total expenditure was only 6.6% over this period.

The third period began in 2005, with increase both in the Ministry of Health's total spending on acquiring antiretrovirals (which went from R\$594 million in 2004 to R\$986 million in 2005), and in the mean annual expenditure per patient (from R\$4,027 to R\$6,124). The growth in total spending on purchasing antiretrovirals was 66% greater than in 2004, thus reaching a level equivalent to what was observed during the first period of the series. The mean expenditure per patient increased by 52.1%, while the number of new patients undergoing treatment grew by 9.2%, thus denoting a significant increase in medication prices. The Ministry of Health's 2006 budget for acquiring antiretrovirals maintains this trend of increasing expenditure.

*Ministério da Saúde. Programa Nacional de DST e Aids. Sistema de Monitoramento de Indicadores do Programa nacional de DST/Aids - Monitoraids. Disponível em <http://aids.go.v.br/monitoraids> [acesso em 30 mar 2006]

**Im May 2006, US\$1 =R\$2,10

Table 2 - Antiretroviral drugs offered by the Ministry of Health for treating, price per pharmaceutical unit and year. Brazil, 1998-2005.

Drugs	Year/ unit price (US\$)							
	1998	1999	2000	2001	2002	2003	2004	2005*
Abacavir tablets, 300 mg	(a)	(a)	(a)	2.700	2.290	1.860	1.855	2.292
Abacavir oral solution, 20 mg/ml; 240 ml bottle	(a)	(a)	(a)	49.500	27.500	34.030	33.998	42.008
Didanosine tablets, 25 mg	0.258	0.232	0.191	0.162	0.070	0.070	0.072	0.089
Didanosine tablets, 100 mg	1.023	0.760	0.501	0.487	0.290	0.310	0.307	0.380
Didanosine powder for oral solution, 4 g vial	60.185	37.810	38.152	33.482	23.190	25.720	25.701	31.756
Lamivudine tablets, 150 mg	2.390	1.512	0.812	0.341	0.220	0.230	0.230	0.284
Lamivudine oral solution, 10 mg/ml; 240 ml bottle	31.176	12.045	12.536	(b)	7.620	8.130	8.120	10.033
Stavudine tablets, 30 mg	1.032	0.465	0.211	0.097	0.080	0.090	0.094	0.117
Stavudine tablets, 40 mg	1.023	0.643	0.274	0.270	0.170	0.180	0.177	0.218
Stavudine powder for oral solution; 200 mg bottle	41.786	35.104	34.445	(b)	18.130	18.670	18.651	23.045
Zidovudine tablets, 100 mg	0.447	0.211	0.180	0.146	0.100	0.110	0.110	0.136
Zidovudine oral solution, 10 mg/ml; 200 ml bottle	8.469	6.298	4.469	(b)	2.670	2.960	2.958	3.655
Zidovudine injectable suspension, 10 mg/ml; 20 ml vial	11.074	2.463	2.109	1.808	3.780	1.400	1.399	1.728
Zidovudine + Lamivudine tablets, 300 + 150 mg	3.379	2.015	0.703	0.676	0.420	0.460	0.456	0.564
Efavirenz tablets, 200 mg	(a)	2.320	2.320	0.840	0.840	(b)	(b)	0.640
Efavirenz tablets, 600 mg	(a)	(a)	(a)	(a)	(a)	2.100	1.590	1.590
Efavirenz oral solution, 30 mg/ml; 180 ml bottle	(a)	(a)	(a)	(a)	28.790	28.790	21.800	21.800
Nevirapine tablets, 200 mg	3.040	3.020	1.280	1.250	0.260	0.280	0.276	0.342
Nevirapine oral suspension, 10 mg/ml; 240 ml bottle	(a)	(a)	55.870	(b)	(b)	33.330	30.940	42.100
Amprenavir tablets, 150 mg	(a)	(a)	(a)	0.745	0.520	0.550	0.683	0.988
Amprenavir oral solution, 15 mg/ml; 240 ml bottle	(a)	(a)	(a)	102.964	91.210	83.230	83.162	116.601
Indinavir tablets, 400 mg	1.940	1.914	1.337	0.470	0.370	0.470/ 0.390	0.389	0.481
Lopinavir / Ritonavir tablets, 133 + 33 mg	(a)	(a)	(a)	(a)	1.600	1.500/ 1.480	1.300	1.170
Lopinavir/Ritonavir oral solut, 80/20 mg/ml; 160 ml bottle	(a)	(a)	(a)	(a)	(c)	(c)	(c)	(c)
Nelfinavir tablets, 250 mg	1.530	1.450	1.360	1.075	0.525	0.520	0.468	0.468
Nelfinavir powder for oral suspension; 7.2 g vial	52.400	52.400	(b)	42.1	42.100	42.100	42.100	42.100
Ritonavir tablets, 100 mg	0.880	0.880	0.880	0.76	0.490	0.460	0.440	0.543
Ritonavir oral solution, 80 mg/ml; 240 ml bottle	168.943	168.943	168.940	(b)	(b)	57.010	57.010	57.010
Saquinavir tablets, 200 mg	1.190	1.190	0.750	0.48	0.480	0.480	0.530	0.504
Atazanavir 150 mg	(a)	(a)	(a)	(a)	(a)	3.250	3.250	3.000
Atazanavir 200 mg	(a)	(a)	(a)	(a)	(a)	3.250	3.250	3.130
Tenofovir 300 mg	(a)	(a)	(a)	(a)	(a)	9.04/ 7.96	7.680	7.280
Thalidomide 100 mg	-	-	-	-	-	-	0.064	0.079
Didanosine EC 250 mg	(a)	(a)	(a)	(a)	(a)	(a)	1.560	1.250
Didanosine EC 400 mg	(a)	(a)	(a)	(a)	(a)	(a)	2.500	1.540
Enfuvirtide (t-20)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	23.700

Source: Programa Nacional de DST/AIDS/SVS/MS e Coordenação-Geral de Suporte às Ações de Assistência Farmacêutica do Departamento de Assistência Farmacêutica do Ministério da Saúde

*Data up to February 14, 2006, subject to alterations

(a) Antiretroviral drug that was not made available by the Ministry of Health in the year indicated

(b) Acquisition was not planned for in the year indicated

(c) Donation from the manufacturing laboratory

The high spending during the period from 1998 to 1999 was associated with the incorporation of new drugs – efavirenz in 1999 and nelfinavir in 1998 – and with a gradual increase in the numbers of patients undergoing treatment. These two drugs marked the start of the incorporation of drugs that are protected under intellectual property rights, into the country's therapeutic arsenal. In subsequent years, it was the acquisition of nelfinavir and efavirenz that had the greatest impact on health budgets destined for acquiring antiretrovirals.

During the years from 2000 to 2004, one of the factors that gave rise to the reduction in spending on antiretrovirals was Brazilian production of ten different generic drugs of great importance for AIDS treatment, which began in the 1990s. In 2001, 56% of all the antiretroviral drugs consumed were produced nationally, thus providing a reduction of 82% in the prices of these medications over the period from 1996 to 2001.^{2,*}

The other factor that contributed towards reducing the spending on antiretrovirals over the period from 2000 to 2004 was price negotiations relating to five imported drugs that are protected by patents,^{3,4} which took place up to the end of the year 2003 (Table 2). Over this period, as a result of negotiations with pharmaceutical companies, the prices of the drugs efavirenz, lopinavir/ritonavir and nelfinavir underwent their greatest reductions (73%, 56.2% and 73.8%, respectively). The incorporation of the drugs tenofovir (2003) and atazanavir (2004), at prices lower than those maintained in pharmaceutical companies' countries of origin (43.6% and 76.4% lower, respectively), contributed towards maintaining the trend of reducing the mean expenditure per patient that had been seen up to that time.⁴

On the other hand, the negotiations for price reductions that took place between the years 2004 and 2005 produced results that were comparatively infe-

*Ministério da Saúde. Programa Nacional de DST e Aids. National Aids drug policies. Brasília (DF): 2001. Disponível em http://www.aids.gov.br/data/documents/storedDocuments/%7BB8EF5DAF-23AE-4891-AD36-1903553A3174%7D/%7B5BE607D2-8253-49E8-9E43-67ABF31E9A05%7D/National_AIDS_Drug_Policy.pdf [acesso em 29 mar 2006]

Table 3 - Annual budget for the National program for STD/AIDS, expenditure on acquiring antiretrovirals and other actions for controlling the epidemic, in millions of reais. Brazil, 1998-2005.

Year	Budget for the PN-DST/Aids	Budgeted expenditure on antiretrovirals*	% of the budget	Expenditure on other actions	% of the budget
1998	271.2	218.9	80.7	52.2	19.3
1999	593.4	468.9	79.0	106.5	18.0
2000	699.4	556.4	79.6	143.0	20.5
2001	643.6	515.5	80.1	128.1	20.0
2002	795.1	611.9	77.0	183.2	23.0
2003	689.0	551.0	80.0	138.0	20.0
2004	809.0	564.0	69.7	245.1	30.3
2005	804.4	549.8	68.4	254.6	31.7

Source: Programa Nacional de DST e Aids/SVS/MS

*This calculation takes into consideration the date of purchasing the drug in the corresponding budget year.

rior to those seen during the preceding period. The prices of the drugs nelfinavir and efavirenz remained unchanged, while the price of lopinavir went down by 1%. For the new medications, tenofovir and atazanavir, discounts of 5.2% and 7.7% were obtained, respectively (Table 2).

Although with a significantly smaller weighting, the rising trend in the Ministry of Health's spending was also associated with price increases in the drugs produced nationally, especially from 2003 onwards (Table 2). In the year 2005, all the drugs produced nationally had their prices raised in dollar terms, except for saquinavir.

Analysis of the expenditure in relation to GDP and federal health spending

The impact of spending on antiretrovirals was analyzed in relation to federal investments destined for other areas of the national response to the AIDS epidemic. The budget of the National Program was broken down into the portions utilized for acquiring medications and for other programmed actions (Table 3). It was observed that the investments in developing other actions within the national response did not suffer any negative impact caused by the spending on acquiring medications. On the contrary: there was growth in the share of such expenditure within the budget of the national Program, from around 20% to a little over 30% over the last two years of the series. It was seen that there was no predatory competition for budget resources within the National Program. The need for increased financial resources to meet the expense of acquiring drugs was supplied by resources coming from other actions within the Ministry of Health in the years 2004 and 2005.

With regard to the proportion of GDP represented by the acquisition of antiretrovirals, it was found that such expenditure comprised 0.0509% of GDP in 2005, thus implying a share that was 1.5 times more than in the year 2004 (Table 4). The proportion of GDP committed to acquiring antiretrovirals in 2005 was simi-

lar to what was seen in 1999 and 2000 and 1.3 times greater than in 1998. The period of least GDP commitment to purchasing medications (mean of 0.035% of GDP) was between the years 2002 and 2004.

The proportion of federal health expenditure directed towards purchasing antiretroviral drugs followed this same trend. It reached its maximum (3.1%) in 1999, reduced to a minimum in 2004 (1.8%), and returned to a rising trend in the year 2005 (2.7%).

By using the mean cost per patient in 2005 as a reference, it was estimated that, by the end of the subsequent three-year period, there would be a nominal 1.29-fold increase in health expenditure on acquiring medications, i.e. from R\$986 million in 2005 to R\$1,273 million in 2008 (Table 5).

Considering GDP growth of 2% for the period from 2006 to 2008, it was observed that the proportion of GDP committed to purchasing antiretrovirals increased. With annual growth of 4% from 2006 to 2008, there would be stability in the proportion of GDP applied to acquiring medications over the first two years and, in the final year of this period, a decreasing trend in this proportion. It would only be with a growth rate of 6% that a decline would be seen in the proportion of GDP utilized for acquiring antiretrovirals. These trends were also observed in relation to federal health expenditure, starting from the same hypotheses as used for GDP growth.

Finally, the financial resources that could be saved in relation to the acquisition of antiretrovirals over the period from 2005 to 2008 were calculated. The difference in total expenditure obtained using the reference points of the mean expenditure per patient in 2004 and in 2005 (Table 5) was considered to represent avoidable spending. Over the four years analyzed, the savings would be of the order of R\$1.5 billion, which would represent a mean annual amount of R\$387.5 million. The amount saved would be equivalent to 65% of the spending in 2004 and 39.3% of the spending in 2005.

Table 4 - Percentages of gross domestic product (GDP) and federal health expenditure committed to acquiring antiretroviral drugs, in billions of reais. Brazil, 1998-2005.

Year	GDP (a)	Health expenditure (b)	expenditure on antiretrovirals* (c)	% of GDP (c/a)	% of health expenditure (b/a)
1998	914	17.5	0.346	0.0379	2.0
1999	974	18.4	0.568	0.0583	3.1
2000	1,101	20.4	0.557	0.0506	2.7
2001	1,199	22.5	0.502	0.0419	2.2
2002	1,346	24.7	0.496	0.0369	2.0
2003	1,556	27.2	0.549	0.0353	2.0
2004	1,767	32.7	0.594	0.0336	1.8
2005**	1,938	36.8	0.986	0.0509	2.7

Fonte: IBGE; Ministério do Planejamento; Programa Nacional de DST e Aids/SVS/MS

*Value of the drugs that were actually distributed to states and municipalities

**Estimated data for the 2005 GDP

DISCUSSION

The Ministry of Health's increased spending on acquiring AIDS medications in the year 2005 interrupted a historical series characterized by a trend towards stabilization of such expenditure, despite the increase in the numbers of patients undergoing treatment and the inclusion of new drugs by SUS during this period. In 2005, the percentages of GDP and federal health expenditure committed to purchasing antiretrovirals reached a peak, returning to the levels seen at the end of the 1990s.

The hypothesis that the increased spending in 2005 was the result of the incorporation of two new drugs at the end of 2003 should be regarded with reserve, for the following reasons:

- As time passes by, the prices of new drugs tend to fall. For example, the incorporation of the drug lopinavir/ritonavir in 2001/2002 did not interrupt the downward trend in spending on acquiring antiretrovirals, since there were reductions in the price of this drug and other imported drugs in subsequent years.
- The presence of original substitute drugs on the market. The prices of atazanavir and lopinavir/ritonavir, which are similar drugs, remained close

to each other (US\$ 3.25 and US\$ 2.96 per treatment/day, respectively).

- In determining drug prices in different markets, there are factors other than the criterion of originality. In comparing the price of the drug tenofovir in Brazil and the price ascertained internationally by Médecins Sans Frontières,^{2,*} it can be seen that, in 2003, the price of this drug in Brazil was 38% less than what was maintained in the international market. However, two years later, this differential had fallen to only 11.7%, showing that the drop in price in Brazil had not followed the trend seen internationally.

Likewise, correction of the Ministry of Health's spending on antiretrovirals over the years 1998 to 2005, in accordance with the general price inflation index, did not alter the observations and conclusions of the present study. The same expenditure trends were maintained over the three periods analyzed: 1998 to 1999, 2000 to 2004, and from 2005 onwards.

In summary, the present study has shown that the incorporation of new drugs that are protected by patents and the increase in the numbers of patients using antiretrovirals are insufficient to explain the increase in expenditure over the period analyzed. The

Table 5 - Estimated expenditure on acquiring antiretroviral drugs, potentially avoidable expenditure, and projections of the percentages of gross domestic product (GDP) and federal health expenditure committed to acquiring antiretrovirals. Brazil, 2006-2008.

Year	Expenditure on antiretrovirals (R\$ millions)			Growth in GDP of 2%* (R\$ billions)				Growth in GDP of 4%* (R\$ billions)				Growth in GDP of 6%* (R\$ billions)			
	A	B	PAE	GDP	FHE	%GDP	%FHE	GDP	FHE	%GDP	%FHE	GDP	FHE	%GDP	%FHE
2005	648	986	338	1893	36.8	0.0509	2.68	1983	36.8	0.0509	2.68	1938	36.8	0.0508	2.68
2006	716	1089	373	2044	39.5	0.0524	2.76	2118	40.2	0.0514	2.71	2159	41.0	0.0504	2.66
2007	777	1181	404	2201	42.3	0.0530	2.79	2315	44.0	0.0510	2.69	2405	45.7	0.0491	2.59
2008	837	1273	436	2383	45.3	0.0533	2.81	2531	48.1	0.0503	2.65	2680	50.9	0.0476	2.50

A: Estimate on the basis of the mean expenditure per patient/year in 2004; B: Estimate on the basis of the mean expenditure per patient/year in 2005; PAE: Potentially avoidable expenditure calculated on the basis of the difference between the estimated expenditures using values per patient from 2004 and 2005; GDP: Gross domestic product; FHE: Federal health expenditure.

*Current values considering the market projections for inflation in the years 2006 and 2007, and the mean of these rates for 2008. Central Bank of Brazil. Inflation Report: March 2006. Brasília. V8:1. Available at URL: <http://www.bcb.gov.br/htms/relinf/direita.asp?idioma=P&ano=2006&acaoAno=ABRIR&mes=03&acaoMes=ABRIR&id=relinf200603> [April 2, 2006]

*Médicos Sin Fronteras. Acceso a ARVs: Detalles prácticos de la reducción dos precios para países en vías de desarrollo. Disponível em <http://www.accessmed-msf.org/documents/Spanish15thMay2003.pdf> [acesso em 1 abr 2006]

Table 6 - Comparison between unit prices for generic antiretroviral drugs for treating adults, according to the amounts paid by the Ministry of Health (MS), and a survey carried out in the international drug market by Médecins Sans Frontières (MSF), 2000 and 2004.

Drugs	Unit price (US\$)					
	MSF price (a)	2000 MS price (b)	Difference % (b/a-1)	MSF price (c)	2005 MS price (d)	Difference % (d/c-1)
Didanosine tablets, 25 mg	0.19	0.19	0	0.290	0.089	30
Didanosine tablets, 100 mg	0.61	0.50	18	0.135	0.380	182
Lamivudine tablets, 150 mg	0.89	0.81	9	0.073	0.284	289
Stavudine tablets, 30 mg				0.019	0.117	516
Stavudine tablets, 40 mg	0.3	0.27	10	0.035	0.218	523
Zidovudine tablets, 100 mg	0.18	0.18	0	0.330	0.136	41
Zidovudine inject susp, 10 mg/ml; 20 ml vial					1.728	
Zidovudine + Lamivudine tablets, 300 + 150 mg				0.250	0.564	212
Nevirapine tablets, 200 mg	1.5	1.28	15	0.100	0.342	242
Indinavir tablets, 400 mg				0.149	0.481	223
Ritonavir tablets, 100 mg				0.114	0.543	576
Saquinavir tablets, 200 mg				0.271	0.504	86

Source: Programa Nacional de DST e Aids/SVS/MS
MS: Ministry of Health
MSF: Médecins Sans Frontières

changes in spending observed were associated with effective and efficient adoption of a set of strategies for reducing drug prices. In this respect, the following can be cited: negotiations with pharmaceutical companies; the existence of national industry capable of developing generic drugs; and the government decision to utilize prerogatives within the Intellectual Property Law when necessary. The sustainability of the policy for universal access will therefore depend on the efficiency and effectiveness of government action in using these strategies.

The study has also shown evidence of weakening of the national generic drug-producing industry over the last few years. As a result of this, there have been increases in the prices of nationally-produced medications, failures in the supply of generic and similar drugs in the years 2004 and 2005,^{*} and reductions in the scientific and technological capacity of these companies, demonstrated by the lack of incorporation of new generic drugs after the year 2001.^{**}

The increase in the prices of generic AIDS medications in Brazil has gone against the international trend. Data from the World Health Organization,^{***} corroborated by studies by the organization Médecins Sans Frontières² have shown that, between 2003 and 2005, the prices of first-line medications, composed fundamentally of drugs with generic versions, were reduced by between 37 and 53%, depending on the treatment combination adopted.

The increase in the prices of nationally produced medications has made the prices maintained in Brazil higher than those in the international market today, different to what was observed in the year 2000, according to data from the Ministry of Health and surveys carried out by Médecins Sans Frontières^{2,****} (Table 6). In 2000, only one of the six generic or similar drugs for adults utilized in Brazil had a higher price than those in other countries, but in 2005, nine out of the eleven drugs offered for treatments had prices higher than those maintained on the international market. Whereas in 2000 the mean price of medications produced in Brazil corresponded to 91.8% of the price for generic drugs commercialized internationally, in 2005 the Brazilian prices were on average three times higher than the lowest prices observed worldwide.

Furthermore, it is emphasized that the results from price negotiations depend on the real capacity for national production of patented drugs, insofar as this allows the differential in prices between patented medications and those produced in this country to be made clear.³ It has to be stressed that national production is not totally limited by the intellectual property law. The development and registration of generic drugs, according to Brazilian legislation and the World Trade Organization, can take place while a patent is in force, but their commercial limitation is limited.

Alternatively, the strengthening of the national industry could take place through the development of drugs

*Sociedade Brasileira de Infectologia. SBI marca posição contra a falta de medicamentos anti-HIV. Disponível em http://www.infectologia.org.br/default.asp?site_Acao=mostraPagina&paginaId=136&mNoti_Acao=mostraNoticia&categoriaId=5¬iciaId=31 [acesso em 2 abr 2006]

**Chequer P. Access to treatment and prevention: Brazil and beyond. Disponível em http://www.aids.gov.br/data/documents/storedDocuments/%7BB8EF5DAF-23AE-4891-AD36-1903553A3174%7D/%7B0D801C0D-328C-4E37-866C-6749918BF746%7D/ias_pres.pdf [acesso em 1 abr 2006]

***World Health Organization. Progress on global access to HIV antiretroviral therapy: a report on "3 by 5" and beyond. Geneva; 2006. Disponível em http://www.who.int/hiv/fullreport_en_highres.pdf [acesso em 28 mar 2006]

****Médecins Sans Frontières. Select drug used in the care of people living with HIV: sources and prices. Paris; 2000. Disponível em <http://www.accessmedmsf.org/upload/ReportsandPublications/492001051334/Sources%20and%20prices%202000.pdf> [acesso em 3 abr 2006]

that are not protected by patents, as has been the case with enteric didanosine (DDI), or by means of combinations of generic drugs. Approximately 80% of all medications commercialized around the world are not subject to patents and could be produced nationally.

Non-utilization of the prerogatives provided for in the accords on intellectual property, such as compulsory licensing, may also have contributed towards increasing the expenditure on antiretrovirals. The government altered the legislation on this matter in 2003,* to allow the importation of generic medications, and in 2004 decreed that lopinavir/ritonavir was a medication of “public utility”,** which is the first legal stage towards compulsory licensing. The lack of greater political determination within the government, in this respect, weakened the Ministry of Health’s negotiating power, and also cast doubt on the capacity to produce new drugs nationally.

The trend towards setting aside increased proportions

of GDP and federal health expenditure for acquiring antiretrovirals demonstrates that the sustainability of the policy for access to antiretroviral drugs will only be ensured if the country grows at an annual rate of 6% over the next three years, a scenario that has been shown to be unlikely. Alternatively, it could be ensured if portions of the budget destined for other health actions and AIDS control actions were redirected, and/or if there were the political will to promote the strengthening of the national generics industry, with the aim of achieving reductions in drug prices.

Additional studies should be conducted to refine the topics and hypotheses presented in this paper, such as in relation to prospection for potentially avoidable expenditure that considers the effect of new drugs that will be incorporated into the therapeutic arsenal, or even with regard to the repercussion that increasing numbers of people undergoing treatment will have on the international generics market and the cost of generics in Brazil.

REFERENCES

1. Levi CG, Vitória, MAA. Fighting against AIDS: the Brazilian experience. *AIDS*. 2002;16:2373-83.
2. Medecins Sans Frontieres. Untangling the web of price reductions. Rio de Janeiro: MSF; 2005.
3. Ministério da Saúde. Programa Nacional de DST e Aids. Nota Técnica: Grupo de trabalho sobre licenciamento compulsório. Brasília (DF); 2003.
4. Ministério da Saúde. Programa Nacional de DST e Aids. Relatório final do grupo de negociação para aquisição e produção de medicamentos anti-retrovirais. Brasília (DF); 2004.
5. Petersen M, Travassos C, Bastos FI, Hacker MA, Beck E, Noronha J. HIV/AIDS in Brazil. In: Beck E, editor. *The HIV pandemic: local and global implications*. England: Oxford University Press; 2006. [in press]
6. Porco TC, Martin JN, Page-Shafer KA, Cheng A, Charlebois E, Grant RM, Osmond DH. Decline in HIV infectivity following the introduction of highly active antiretroviral therapy. *AIDS*. 2004;18(1):81-8.
7. Teixeira PR, Vitória MA, Barcarolo J. Antiretroviral treatment in resource poor settings: the Brazilian experience. *AIDS*. 2004;18(Suppl 3):S5-S7.

*Brasil. Portaria Ministerial nº 985, de 24 de junho de 2005. Declara, para fins de sustentabilidade social do programa brasileiro de combate à AIDS, interesse público relativamente aos medicamentos advindos da associação dos princípios ativos Lopinavir e Ritonavir, com vista à composição do rol dos inibidores de protease que devem compor o arsenal terapêutico para o tratamento da infecção por HIV/AIDS no Brasil.
**Brasil. Decreto nº 4.830, de 4 de setembro de 2003. Dá nova redação aos artigos 1º, 2º, 5º e 10º do Decreto nº 3.201, de 6 de outubro de 1999, que dispõe sobre concessão, de ofício, de licença compulsória nos casos de emergência nacional e de interesse pública de que trata o art. 71 da Lei nº 9.279, de 14 de maio de 1996.