



National AIDS Drug Policy

June 2001

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Foreword

The Brazilian HIV/AIDS drug policy has been highly debated and criticised, particularly at the time of its implementation by the national authorities in the early 90s. The dearth of trained health professionals and the poor structure of the health services, the lack of laboratories capable of monitoring the infection, and the patients' capacity of adhering to treatment were hotly questioned. National and international experts and health professionals, managers of programs of prevention and care of people living with HIV/AIDS, staff responsible for the budgetary and financial execution of public monies and international organisations argued amid reports of treatment assessment and cost-benefit studies and projections both favourable and contrary to the implementation of a such a costly policy for the State.

However, fortunately, reality not only corroborated our policy; over and above, the statements of its most optimistic defenders were outdone by their remarkably positive results. The quality of the government-provided services is reflected by the significant improvement in the health status and in the control of the infection among people living with HIV/AIDS. To this more immediate consequence of the antiretroviral regimens recommended by the Brazilian Ministry of Health one must add several social, economic and political benefits, both palpable and yet to be achieved, without precedent in the history of Public Health in our country.

At the present time, the success of the program for the free and universal distribution of these drugs to every patient who needs them cannot be doubted. In addition, its repercussion may contribute to the global debate on the access of people living with HIV/AIDS to antiretroviral treatment, with strong priority to the poorest countries, which bear the heaviest brunt of an epidemic that, according to UNAIDS data, was responsible for 5.3 million new infections and 3 million AIDS deaths in 2000 alone.

The so-called developing countries suffer from the lack of public resources, social problems and political oppression. AIDS has shown, in bright and sharp colours, all the contrasts unveiled by the epidemic in these countries when its threat does not elicit a response or is not tackled with the responsibility, competence and a humanist and solidary planning that are necessary.

This document retraces the most recent history of the unquestionable advances in laboratory care and in the treatment of HIV infection and assesses its development from the perspective of the unique Brazilian experience in the efforts for the prevention and control of the epidemic.

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Background

The Brazilian population is estimated at 169,5 million people. From 1980 until December 2000, 203,353 AIDS cases were reported to the National STD and AIDS Program (NAP) of the Ministry of Health (MoH). 151,298 of them are males and 52,055 females; 7,086 are children. It is estimated that 597,000 Brazilians are infected with HIV. Since 1996, the incidence rate has stabilised around 14 cases per 100,000 population. The number of new cases reported in the last five years was approximately 22,000 per year.

The Ministry of Health's policy for the care of people living with HIV/AIDS includes, among several other initiatives, the creation of the Laboratory Network for the Quantification of Viral Load and CD4+ and CD8+ cell counts, the organization of health care services, the support to the organization of People Living with HIV/AIDS and to projects carried out by Non-Governmental Organizations, and the creation of a program for the free and universal access to antiretroviral drugs through the public health network.

This program, begun in the early 90s with the distribution of AZT capsules, was expanded and consolidated in 1996 by Congressional Bill 9113, of 13 November 1996, that guarantees every patient the access, free of direct costs, to all the medication required for his/her treatment, including protease inhibitors (since December 1996), following treatment criteria and guidelines set forth by the MoH. The Ministry thus created two advisory committees, with the mandates to define a Consensus on the Recommendations and Guidelines for the Use of Antiretroviral Therapy in Adults and Adolescents and a second similar consensus on treatment for children. The committees meet periodically at least once a year, to review the recommendations and adjust them to the updated scientific knowledge and the availability of new drugs.

According to the current recommendation, the use of antiretroviral drugs is indicated for all symptomatic HIV-infected patients, asymptomatic patients with significant laboratory changes, for HIV+ pregnant women, aiming at the reduction of vertical transmission, and for the prophylaxis of HIV infection in health professionals after exposure to potentially contaminated biological material.

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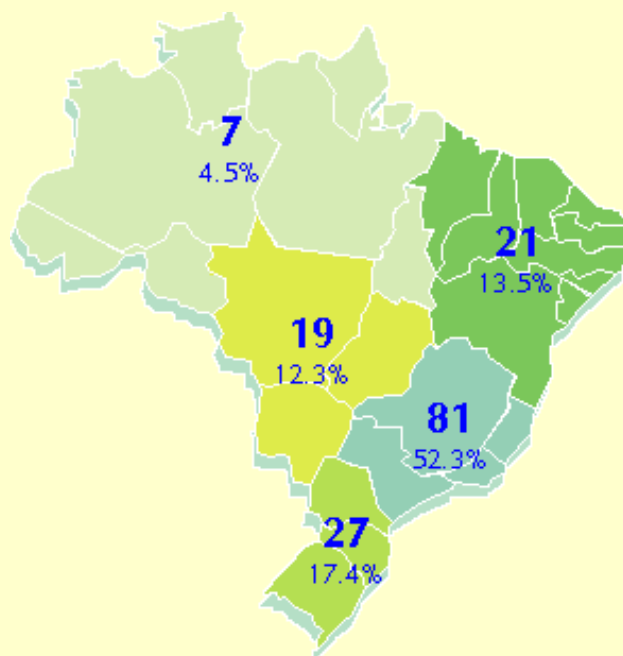
Infraestructure of the System for HIV+ Patient Care

In the past 5 years, the MoH has adopted the strategy of offering modalities of care that favour outpatient care, such as Specialized Care Services (148), Day Hospitals (69) and Therapeutic Home Care (52), which complement the care provided by the 362 Accredited Hospitals for HIV/AIDS care. The availability of these care modalities has enabled a higher quality of life for the patient and lower costs of care. It is important to highlight that these figures do not include all services available for HIV+ patients, reflecting only those that have the infrastructure defined by the MoH as a requirement of a specialized care service and have requested their accreditation as such.

A study of the direct costs of AIDS care in Brazil in 1996, carried out by the Foundation Institute of Economic Research _ FIFE, with the support of NAP, comparing the average costs per day of hospital stay, proved that the cost of conventional hospitalisation (US\$ 97.31) was twice that of Day Hospital admission (US\$ 47.02) and almost nine fold higher than Therapeutic Home Care (US\$ 11.31).

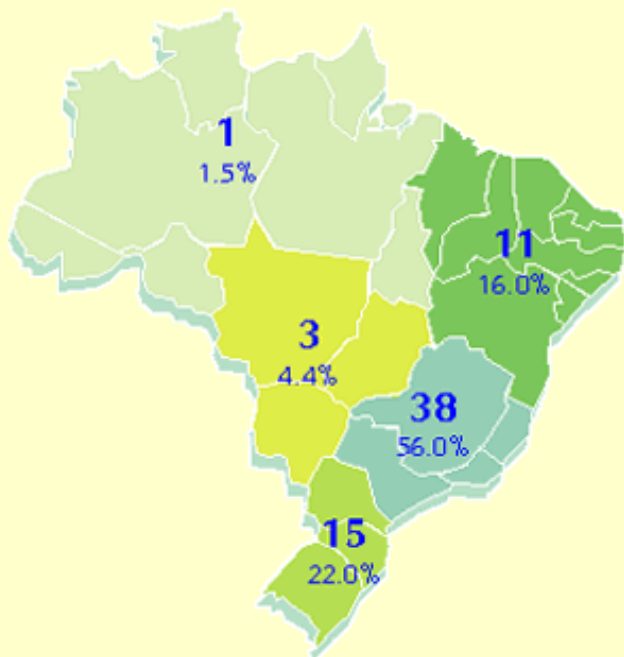
The Brazilian policy of access to antiretroviral therapy has resulted in a shift of the morbidity and mortality profile of HIV infection and thus in the profile of service utilization. In the past years, the demand for outpatient services has grown significantly with a decrease in the demand for Home Care, Day Hospital and Conventional Hospitalization.

Distribution of Specialized Care Services (SCS) on HIV/AIDS.



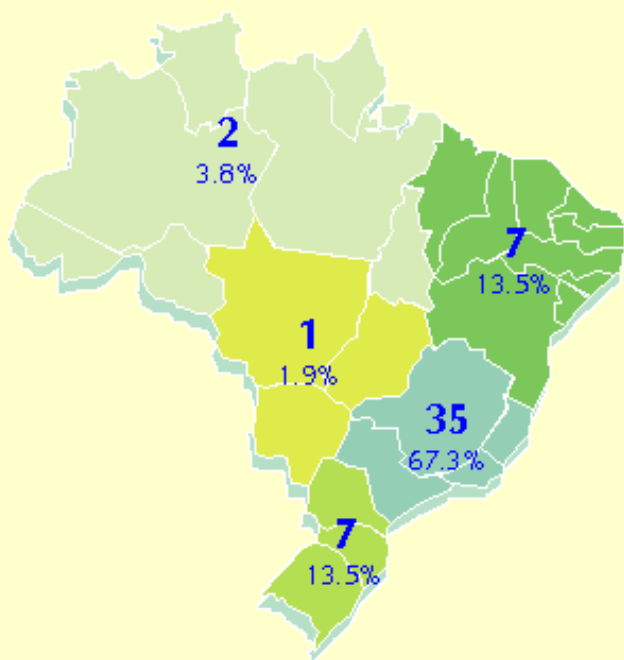
Nº SCS = 155

Distribution of Day Hospitals (DH) for HIV/AIDS Care.



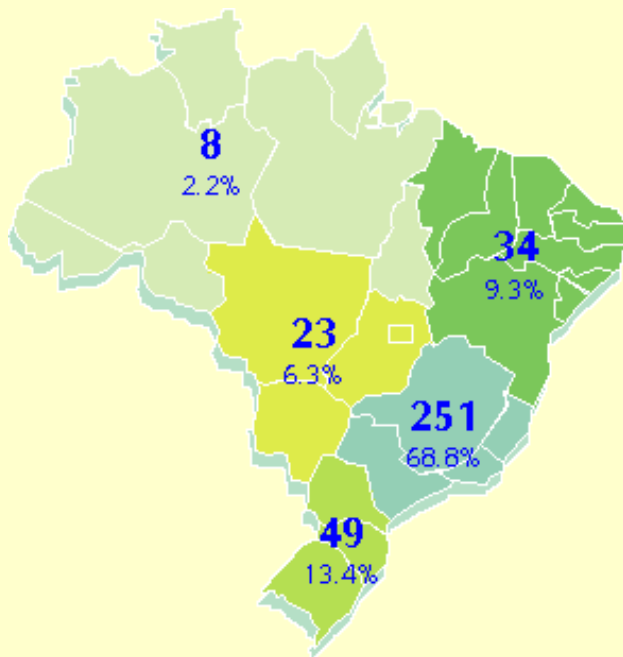
Nº DH = 68

Distribution of Home Therapeutic Care Projects (HTC) on HIV/AIDS.



Nº HTC = 52

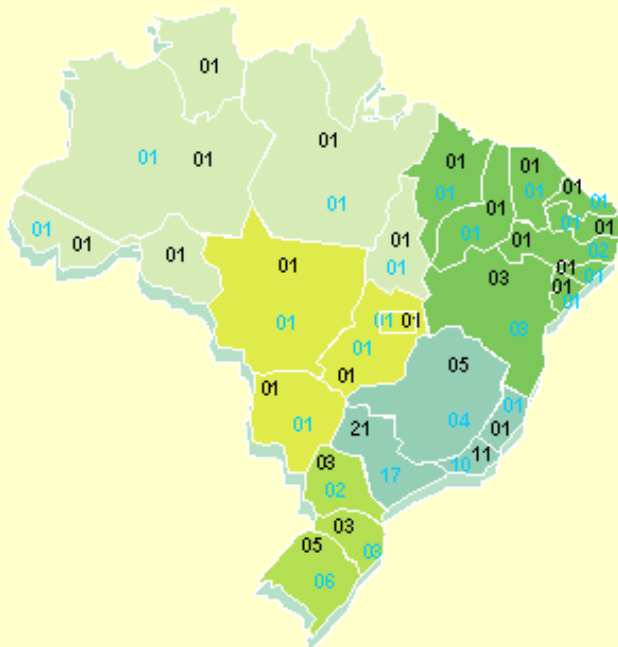
Distribution of Accredited Hospitals (AH) for HIV/AIDS Care.



Nº AH = 365

Concomitant to the drug distribution policy, NAP has endeavoured to strengthen the public laboratories and implement the National Network of Laboratories for T CD4+ Lymphocyte Counts (70) and for HIV Viral Load Quantification (63). This network carries out the tests required for the indication of antiretroviral therapy and chemoprophylaxis of opportunistic infections, as well as for the appropriate monitoring of patients under treatment. In 2001, 422 thousand viral load tests and 422 thousand T CD4+ lymphocyte counts are expected, corresponding to a total expenditure of approximately US\$ 18 million (unitary costs of US\$ 15 per CD4+ test and US\$ 29 per viral load test).

National network of laboratories for TCD4+ lymphocyte counts and viral load quantification - 2001



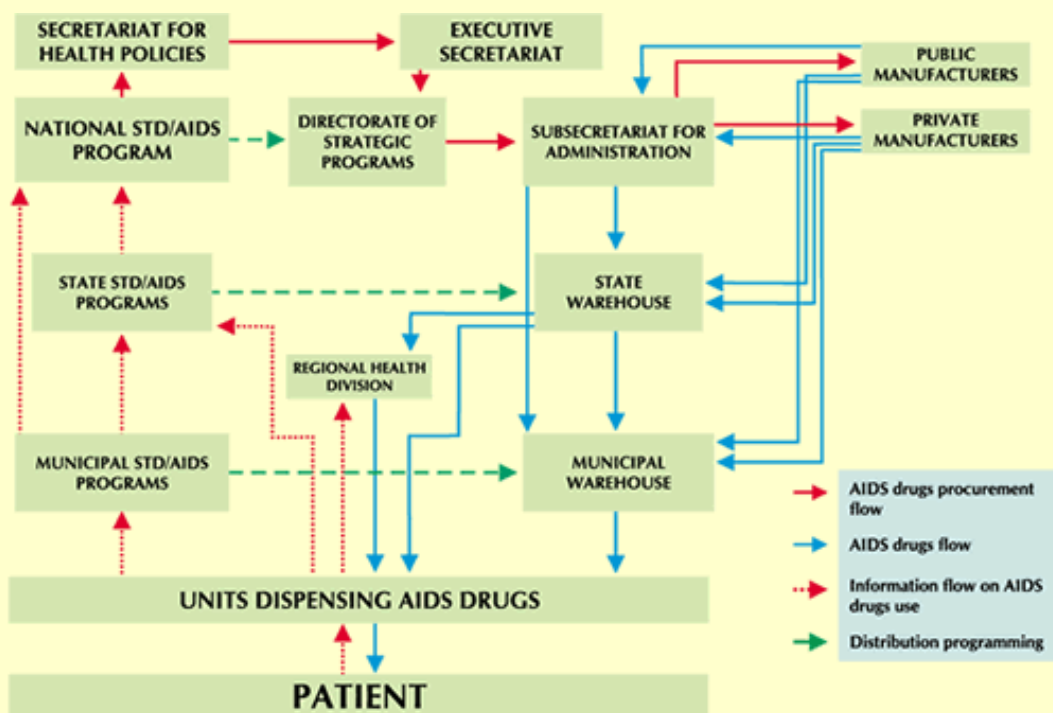
Viral load = 63 Lab. T CD4+ = 70 Lab.

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AIDS Drugs Logistic System

Logistics of AIDS Drugs - Ministry of Health



This flowchart shows the functioning of the AIDS drugs logistic system. Brown arrows indicate the procurement flow within the MoH, which starts with the programming of needs, done by NAP; green arrows demonstrate distribution programming; blue arrows, the different drug flows from delivery by the manufacturers to dispensation to the patient; and red arrows, the flow of information from the patient to NAP, including data essential for the distribution and procurement programming.

The current list of antiretrovirals provided by the MoH includes 13 drugs (5 nucleoside analog reverse transcriptase inhibitors-NRTI, 3 non-nucleoside analog reverse transcriptase inhibitors-NNRTI, and 5 protease inhibitors-PI), in 27 pharmaceutical presentations.

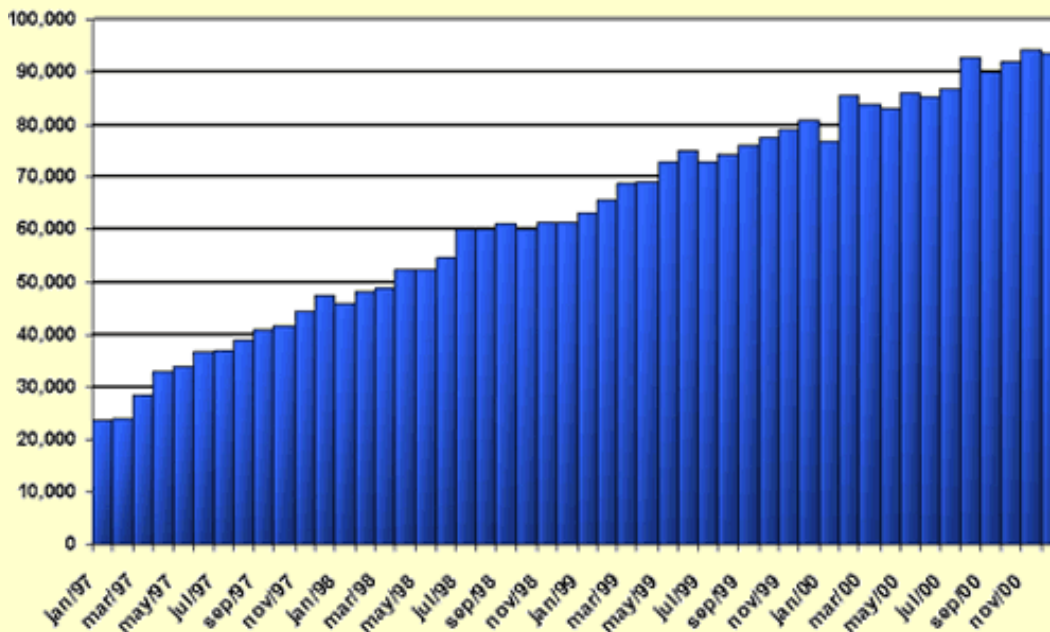
Year of first distribution	Antiretroviral drugs
1991	zidovudine capsule 100 mg
1992	zidovudine oral solution
1993	didanosine 25 and 100 mg tablets
1996	zalcitabine 0.75 mg tablet, injectable zidovudine, lamivudine 150 mg tablet, saquinavir 200 mg capsule and zalcitabine 100 mg capsule
1997	indinavir 400 mg capsule, lamivudine oral solution, stavudine 30 and 40 mg capsules
1998	ritonavir oral solution, didanosine pediatric powder, zidovudine + lamivudine 300+150 mg tablet, nelfinavir 250 mg tablet and pediatric powder, nevirapine 200 mg tablet, stavudine pediatric powder and delavirdine 100 mg tablet
1999	efavirenz 200 mg capsule
2000	efavirenz 50 and 100 mg capsules for pediatric patients and nevirapine oral suspension
2001	amprenavir 150 mg capsule and oral solution

It is important to highlight that while the Federal Government is responsible for ARV drugs, the procurement and distribution of drugs for treating opportunistic diseases is decentralized to the states and municipalities.

AIDS drugs needs are estimated according to the following data:

- Historical series of the total number of adult and paediatric patients on ARV therapy
- Historical series of the number and percentage of patients using each ARV drug and each therapeutic regimen
- New recommendations on ARV therapy

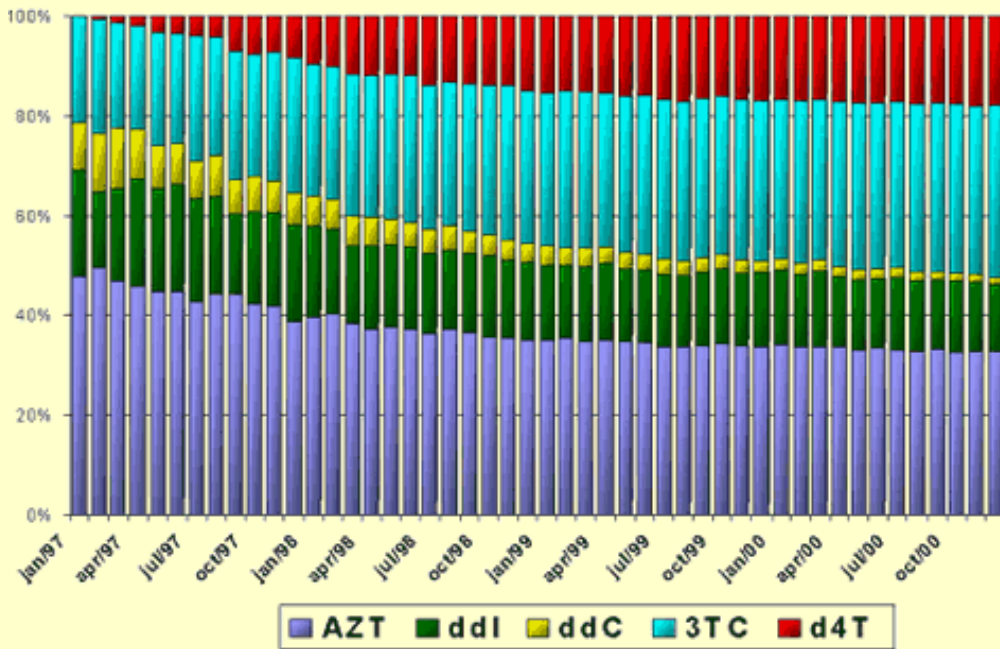
Number of HIV+ patients on ARV in the Brazilian Public Health System (Jan/97- Dec/00)



Source: Ministry of Health/Brazil

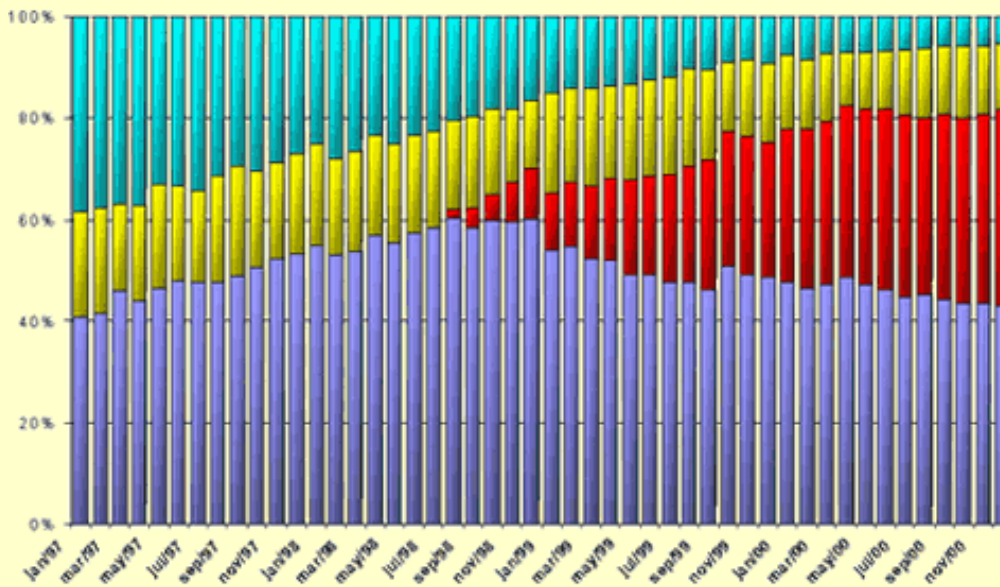
There are currently 98,000 infected individuals on antiretroviral treatment; 95% of which are adults and adolescents and 5% children (<13 years old). As a comparison, in January 1997, approximately 23,000 people benefited from the free access policy.

% distribution of use. Brazil. Jan/97 - Dec/00



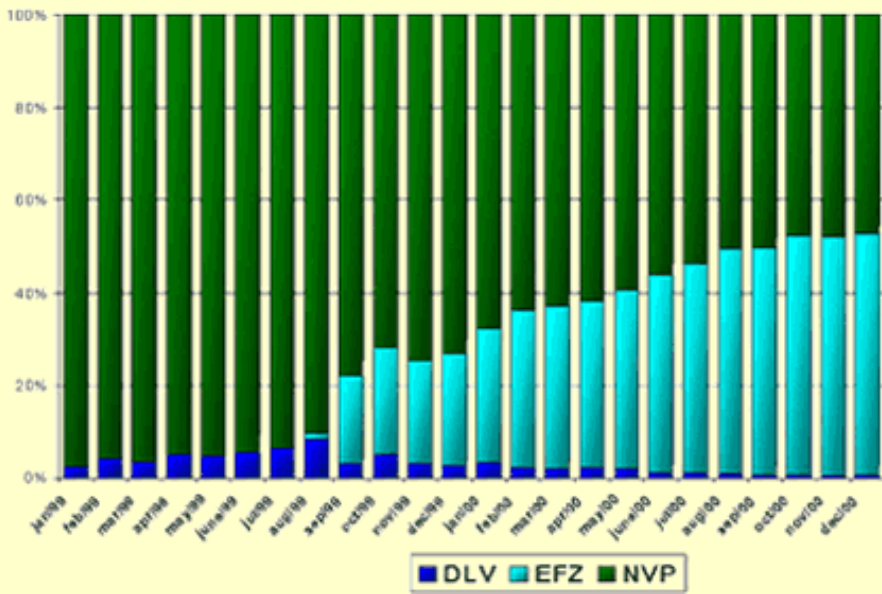
Source: Ministry of Health/Brazil

% distribution of PI use. Brazil. Jan/97 - Dec/00



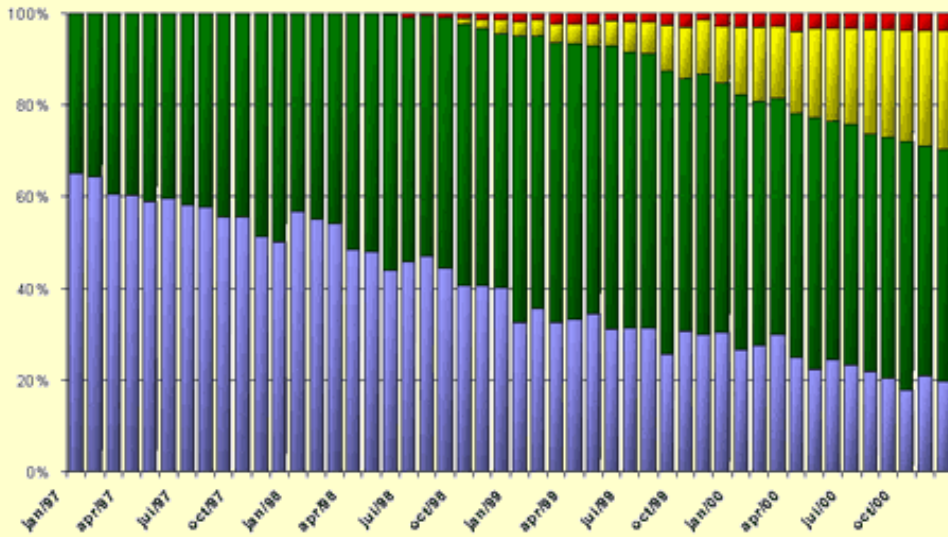
Source: Ministry of Health/Brazil

% distribution of NNRTI use. Brazil. Jan/99 - Dec/00



Source: Ministry of Health/Brazil

% of patients by ARV regimen. Brazil. Jan/97 - Dec/00

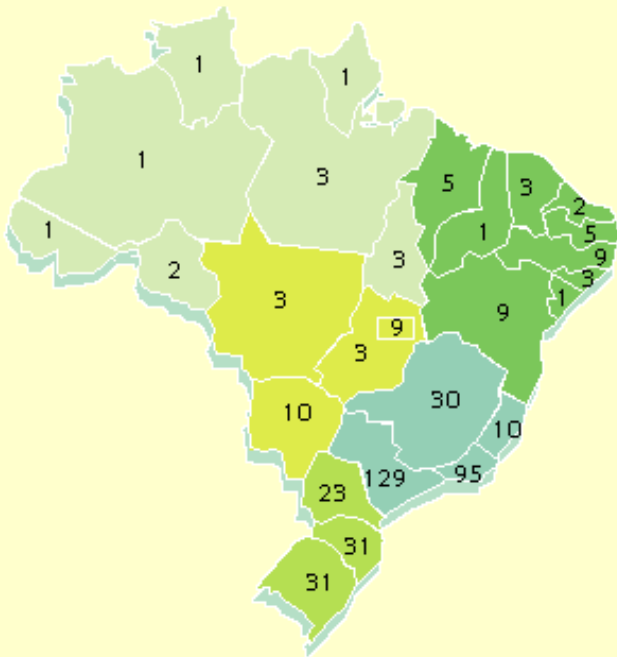


*Estimated data Source: Ministry of Health/Brazil - Source: Ministry of Health/Brazil

Drug procurement is usually carried out once a year and complies with the Brazilian laws governing public bidding. Deliveries are usually divided in three to four consignments.

Patients receive ARV drugs in the Units Dispensing AIDS Drugs, which usually are the pharmacies of HIV/AIDS outpatient services. Currently there are 424 such units throughout the country.

AIDS drugs dispensing units. Brazil, 2001



TOTAL = 424

NAP has developed a Computerized System for the Control of Drug Logistics (SICLOM), with the following main characteristics:

- Nation-wide patient register
- Registration linked to the individual drug dispensing unit
- Validation of the register and dispensation, using MoH criteria.
- Computerization of the dispensing units
- Certification of the ARV prescription through a magnetic card
- Patient information on the appropriate use and storage of drugs
- Daily transfer of data to the NAP by telephone data transmission

SICLOM has been implemented in the 111 largest Dispensing Units, which account for approximately 65% of patients on ARV therapy in Brazil. A managerial module for SICLOM is now being developed by NAP.

Computerized System for the Logistical Control of Drugs



Quality of Life

Civil Rights

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National Production of Antiretroviral Drugs

Domestic production started in Brazil in 1993, with AZT by the private company. In the following year, AZT production in the public sector was begun by LAFEPE, Laboratório do Estado de Pernambuco. Domestic AIDS drugs production comprises 7 ARVs: zidovudine (AZT), didanosine (ddI), zalcitabine (ddC), lamivudine (3TC), stavudine (d4T), indinavir and nevirapine, and by the association zidovudine+lamivudine (AZT + 3TC). Three ARV drugs distributed by the MoH _ amprenavir, efavirenz and nelfinavir - are under patent protection.

The national production of zalcitabine and stavudine started in 1997, that of didanosine in 1998, lamivudine and zidovudine +lamivudine in 1999 and of indinavir and nevirapine in 2000.

Public laboratories manufacturing ARVs are: Far-Manguinhos/FIOCRUZ/MoH, Fundação para o Remédio Popular/SP, Laboratório Farmacêutico do Estado de Pernambuco, Fundação Ezequiel Dias/MG, Indústria Química do Estado de Goiás, and Instituto Vital Brasil/RJ. In 2000, Far-Manguinhos provided approximately 30% of the ARV drugs used in Brazil, corresponding to 45% of the funds spent in purchases from national manufacturers. Seven Far-Manguinhos products _ zidovudine capsules, didanosine tablets, lamivudine tablets, zidovudine+lamivudine tablets, stavudine capsule, indinavir capsule and nevirapine tablet - have been approved in bioequivalence tests and thus are eligible for licensing as a generic drug.

The quality control of the antiretrovirals distributed by the MoH is done by: (1) mandatory statement from the competent health authority in the country of manufacture, certifying that the plant complies with the Good Manufacturing Practices (GMP); (2) preliminary inspection of the pharmaceutical plant before the first delivery of the product; (3) monitoring of the production of the first batches; (4) in the early phases of the procurement contract, analysis of batches purchased at laboratories accredited by the National Health Surveillance Agency/MoH; and (5) starting in 2001, mandatory bioequivalence testing of all drugs purchased. Bioequivalence tests, certifying drug interchangeability, are a recent achievement of the Brazilian National Drug Policy, guaranteed by the 1999 Generic Drugs Bill. The Brazilian bioequivalence process comprises pharmaceutical, clinical, analytic and statistical testing. Clinical studies are carried out mainly by the quantification of the drug or its active metabolite in the circulation (most commonly in blood, plasma or serum samples) of healthy volunteers, who receive the drugs being tested and the reference drugs at different times, in single or multiple dose regimens. This is a complex study and it requires the submission of a research project, experimental protocol, free and informed consent form, and approval by the Committee of Ethics in Research.

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Drug Expenditures and decrease of ARV Therapy Costs

The Federal Government's expenditures with the purchase of antiretrovirals was approximately US\$ 34 million in 1996, US\$ 224 million in 1997, US\$ 305 million in 1998, US\$ 336 million in 1999 and US\$ 303 million in 2000; it is estimated that they will reach US\$ 422 million in 2001. Between 1999 and 2000, in spite of increased numbers of patients on treatment and of the proportion of patients on more complex and expensive regimens, there was a reduction in the overall costs of drug procurement. These expenditures corresponded to 0.2% of the MoH budget in 1996, 1.2% in 1997, 1.8% in 1998, 3.2% in 1999, and 2.9% in 2000, with an estimated 2.9% in 2001. In terms of GDP, they have ranged between 0.004% in 1996 to 0.06% in 1999.

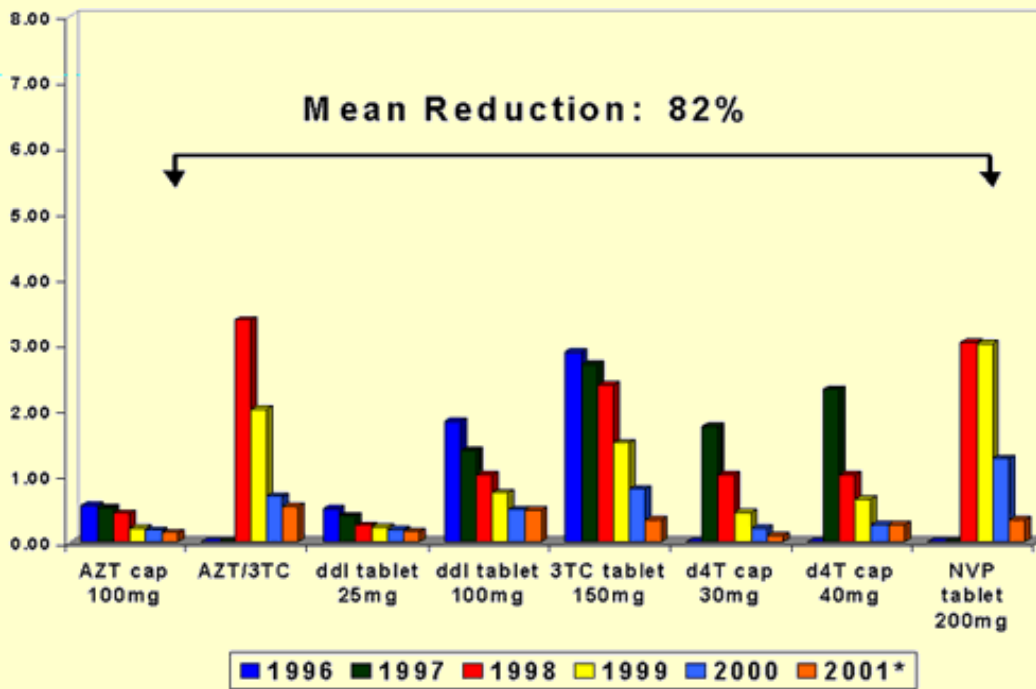
MOH expenditures on ARV drugs (1996-2001)

Year	Million US\$	Average nº patients	% MOH budget
1996	34	-	0.2
1997	224	35,900	1.2
1998	305	55,600	1.8
1999	336	73,000	3.2
2000	303	87,500	2.9
2001*	422	105,000	2.9

* estimated data - Source: NAP/MoH

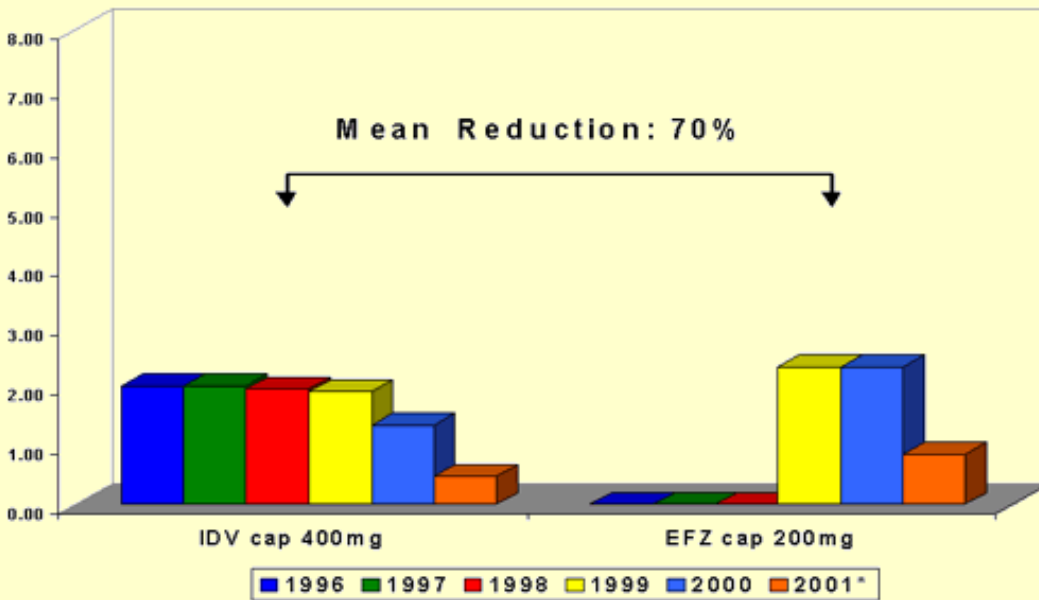
The prices of antiretroviral drugs purchased by the MoH have shown a declining trend over the past few years, largely due to the MoH investments to foster the production by public manufacturers and to the policy of price negotiation in the case of single exclusive manufacturers. The most significant drops are seen in the prices of drugs that are domestically produced, both by private national companies and especially by public manufacturing laboratories, and in prices negotiated with multinational companies that have adopted the system of differentiated prices, according to the Human Development Index and rate of HIV infection in the country's adult population.

Price evolution (in US\$) of ARV for adult use with domestic production. Brazil, 1996 - 2001



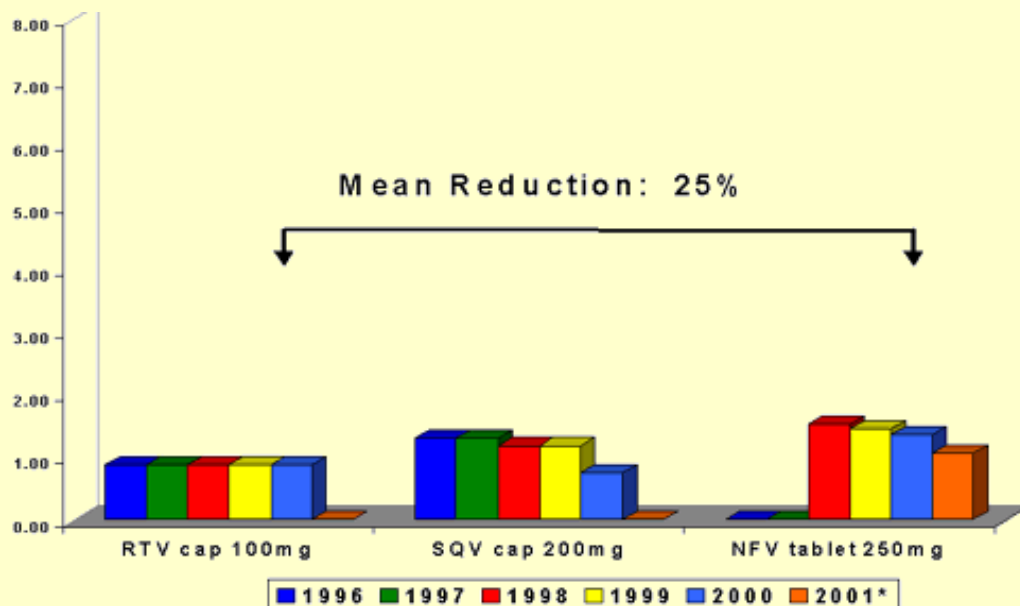
* estimated data - Source: Ministry of Health/Brazil

Price evolution (in US\$) of ARVs, with negotiation based on differentiated prices (HDI and HIV prevalence in the country). Brazil, 1996 - 2001



* estimated data - Source: Ministry of Health/Brazil

Price evolution (in US\$) of imported ARVs for adult use. Brazil, 1996 - 2001



* estimated data - Source: Ministry of Health/Brazil

Prices of ARV drugs. Brazil. 1996 a 2001

DRUG	Unit price US\$ ⁽¹⁾					
	1996	1997	1998	1999	2000	2001 ⁽²⁾
DIDANOSINE 25 mg Tab	0.52	0.41	0.26	0.23	0.19	0.16
DIDANOSINE 100 mg Tab	1.85	1.39	1.02	0.76	0.50	0.49
DIDANOSINE POWDER FOR BOTTLE/ORAL SOLUTION 4g	(a)	(a)	60.19	37.61	36.15	33.46
LAMIVUDINE 150 mg Tab	2.90	2.70	2.39	1.51	0.81	0.34
LAMIVUDINE ORAL SOLUTION 240ml BOTTLE/10 mg/ml	(a)	45.57	31.18	12.05	12.54	(b)
ESTAVUDINE 30 mg Tab	(a)	1.75	1.03	0.46	0.21	0.19
ESTAVUDINE 40 mg Cap	(a)	2.32	1.02	0.64	0.27	0.27
ESTAVUDINE POWDER FOR ORAL SOLUTION 200mg BOTTLE	(a)	(a)	41.79	35.10	34.45	(b)
ZALCITABINE 0.75 mg Tab	1.55	1.08	0.58	0.18	0.08	(d)
ZIDOVUDINE 100 mg Cap	0.56	0.53	0.45	0.21	0.18	0.15
ZIDOVUDINE 10 mg/ml ORAL SOLUTION 200 ml BOTTLE	10.22	9.17	8.47	6.30	4.47	(b)
INJECTABLE ZIDOVUDINE 10 mg/ml 20 ml vial	13.40	11.93	11.07	2.46	2.11	1.75
ZIDOVUDINE+LAMIVUDINE 300 mg + 150 mg Tab	(a)	(a)	3.38	2.01	0.70	0.54
EFAVIRENZ 50 mg Cap	(a)	(a)	(a)	0.65	0.65	(b)
EFAVIRENZ 100 mg Cap	(a)	(a)	(a)	1.3	1.3	(b)
EFAVIRENZ 200 mg Cap	(a)	(a)	(a)	2.32	2.32	0.84
DELAVIRDINE 100 mg Tab	(a)	(a)	0.48	0.48	(d)	(d)
NEVIRAPINE 200 mg Tab	(a)	(a)	3.04	3.02	1.26	0.337
NEVIRAPINE 10 mg/ml ORAL SUSPENSION 240ml BOTTLE	(a)	(a)	(a)	(a)	55.67	(b)
AMPRENAVIR 150 mg Cap	(a)	(a)	(a)	(a)	(a)	0.72
AMPRENAVIR 15 mg/ml ORAL SOLUTION 240ml BOTTLE	(a)	(a)	(a)	(a)	(a)	99.76
INDINAVIR 400 mg Cap	2.00	2.00	1.94	1.91	1.34	0.47
NELFINAVIR 250 mg Tab	(a)	(a)	1.53	1.45	1.36	1.08
NELFINAVIR POWDER FOR ORAL SOLUTION 7.2 g BOTTLE	(a)	(a)	52.40	52.40	(b)	(c)
RITONAVIR 100 mg Cap	0.90	0.90	0.88	0.88	0.88	(c)
RITONAVIR 80 mg/ml ORAL SOLUTION 240 ml BOTTLE	(a)	222.41	168.94	168.94	168.94	(b)
SAQUINAVIR 200 mg Cap	1.31	1.31	1.19	1.19	0.75	(c)

(a) ARV not offered by the MoH in the year

(b) procurement not programmed in the year

(c) procurement in progress

(d) ARV no longer purchased by the MoH

Source: NAP and Directorate for Strategic Programs/MoH

Notes: (1) ARV purchased in R\$ converted in US\$ using the mean year exchange rate except for 2001

(2) preliminary data

(3) 2000 data estimated by Far-Mang uinhos

impact of the domestic ARV production on the cost of treatment between 1997 and 2000, using the average cost per patient/day in 1997 as a baseline and taking into account the increase of the number of patients on treatment, estimated that, had the 1997 cost remained constant, the expenditure would have been between US\$ 200 million and US\$ 250 million higher, and total ARV therapy costs would have exceeded US\$ 400 million in 2000. Considering only indinavir and nevirapine, drugs that are part of the triple therapy, whose domestic production was started in 2000, it was estimated that savings were greater than US\$ 80 million, accounting for approximately 30% of the total costs in the year.

In a second moment, the study assessed the economic impact of domestic AIDS drug production, by comparing average patient/day costs calculated for 2000 with prices in the private US sector and in the public Canadian sector (British Columbia). In relation to Canadian prices, the economy was calculated as approximately US\$ 200 million; in relation to US prices, of 540 million dollars.

The same study assessed the impact of annual costs of ARV therapy in the years 2001-2004, in case of continuing patent protection of nelfinavir and efavirenz, using as baseline data:

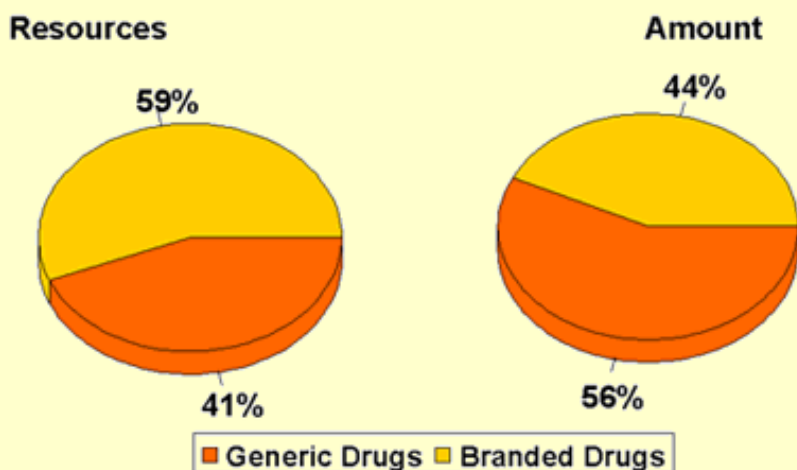
- The proportion of nelfinavir and efavirenz in the period 2001-2004, estimated by statistical methods, assuming that ARV use will keep its current rate of increase until the first semester of 2001 and stabilise in early 2003.
- The projected average costs of ARV therapy per patient/day in 2001-2004, based on the trend of variation of drug costs in 1997-2000. Two different projections were made for nelfinavir and efavirenz. The first assumes the beginning of domestic production in the second semester of 2001, and costs for 2001-2004 were projected with the same declining trend observed in 1999-2000 after the start of national production of triple therapy drugs. The second assumes continuing import of the drugs with prices unchanged.

According to this study, if domestic production of both drugs is started, the average cost of ARV therapy by patient/day will fall by approximately 30% in 2001 and the cost of ARV drugs will remain close to US\$ 300 million in the following years, in spite of the expected increase in the number of patients in treatment to 160,000 by the end of 2004.

On the other hand, if both drugs continue to be imported, with no price reduction, there would be an additional cost of US\$ 425 million in the period 2001-2004.

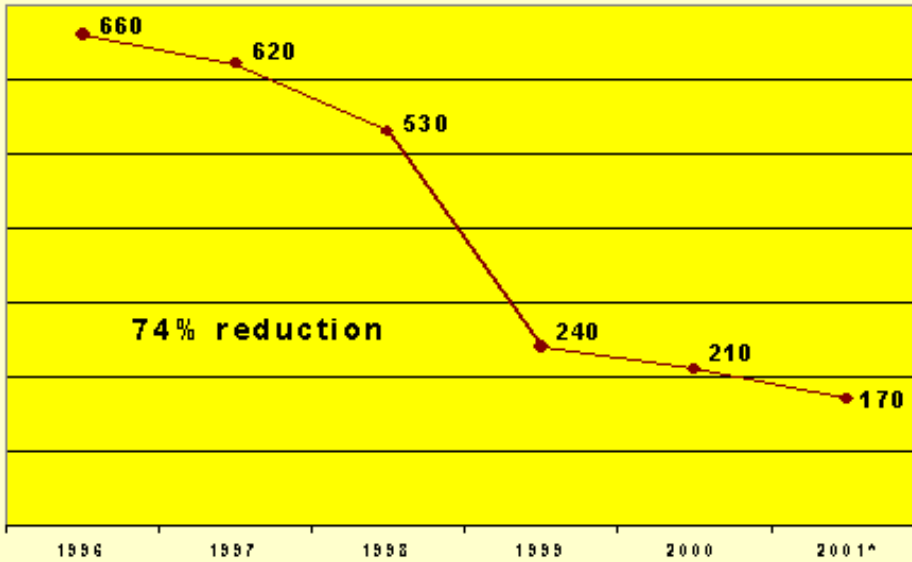
In 1999, 47% of antiretroviral drugs, accounting for 19% of the expenditures, were purchased from national companies (92.5% from public and 7.5% from private manufacturers); 53%, corresponding to 81% of the expenditures, were purchased from multinational pharmaceutical companies. In 2000, 56% of ARVs (41% of the expenditures) were purchased from national companies and 44% (59% of the expenditures), from multinational pharmaceutical companies. It is interesting to point out that, some drugs that were domestically produced were still provided by multinational companies, which lowered their prices and won governmental bids.

ARV procurement: Distribution of resources and amount by type of manufacturer. Brazil, 2000



This reduction of ARV prices in Brazil led to a considerable decrease in the costs of AZT chemoprophylaxis for the control of HIV vertical transmission (complete ACTG 076) from US\$ 660 in 1996 to US\$ 170 in 2001 (74% variation).

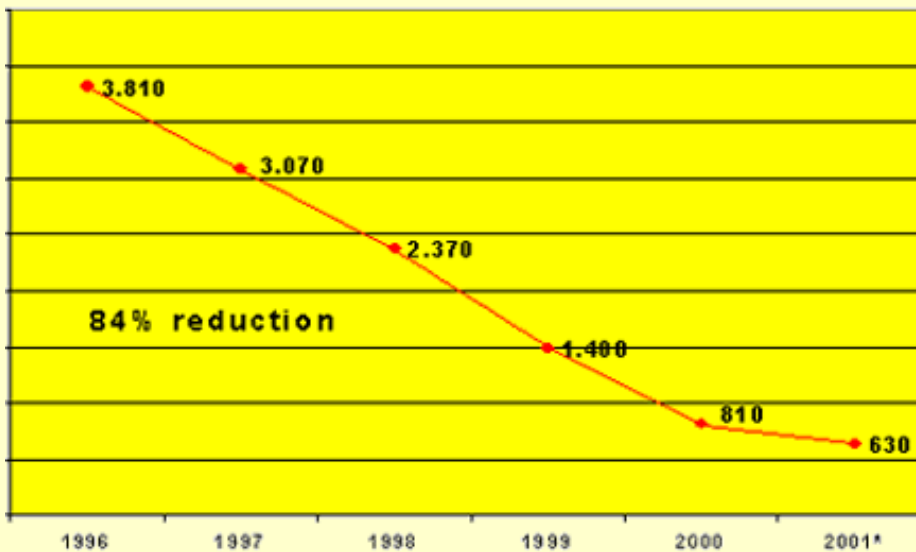
Costs of ZDV chemoprophylaxis (in US\$) for the reduction of vertical transmission - ACTG 076. Brazil, 1996 - 2001



* preliminary data - Source: Ministry of Health/Brazil

The mean weighted cost of double NRTI therapy dropped from US\$ 3,810 per patient/year in 1996 to US\$ 630 in 2001 (preliminary data), with a 84% reduction.

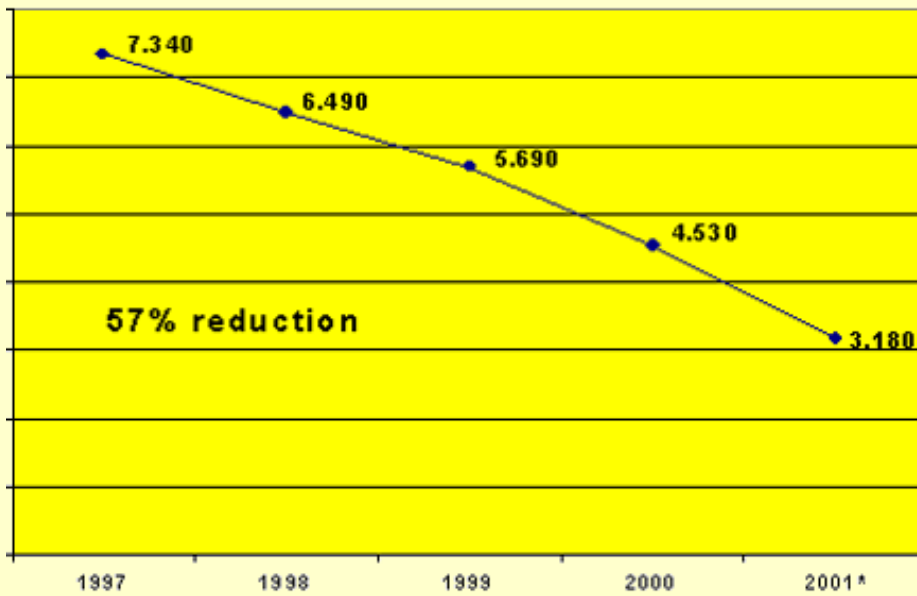
Mean cost (in US\$) of double NTRI therapy per patient/year. Brazil, 1996 - 2001



* preliminary data - Source: Ministry of Health/Brazil

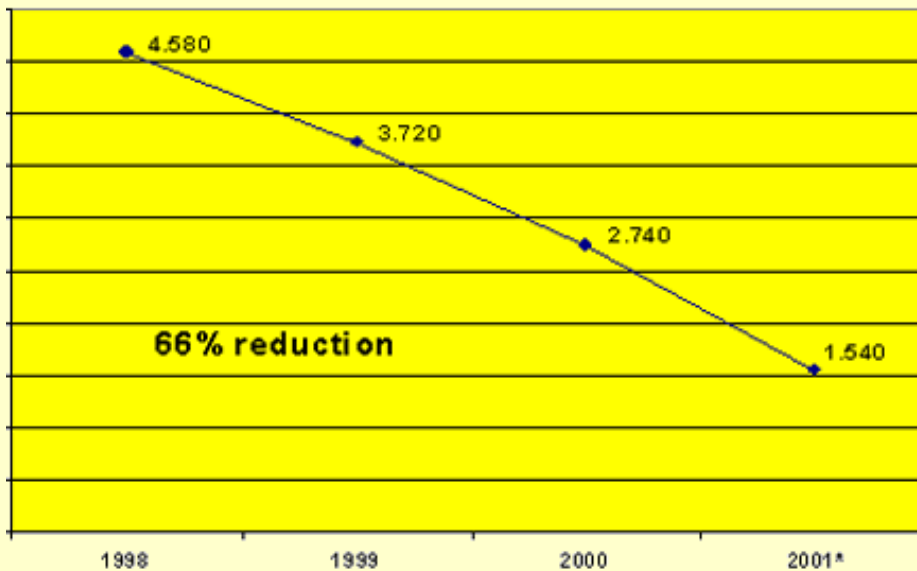
The reduction of the mean weighted cost of triple regimens including PIs or NNRTIs is estimated at 57% and 66%, respectively.

Mean cost (in US\$) of triple therapy (2 NTRI + PI) per patient/year. Brazil, 1996 - 2001



* preliminary data - Source: Ministry of Health/Brazil

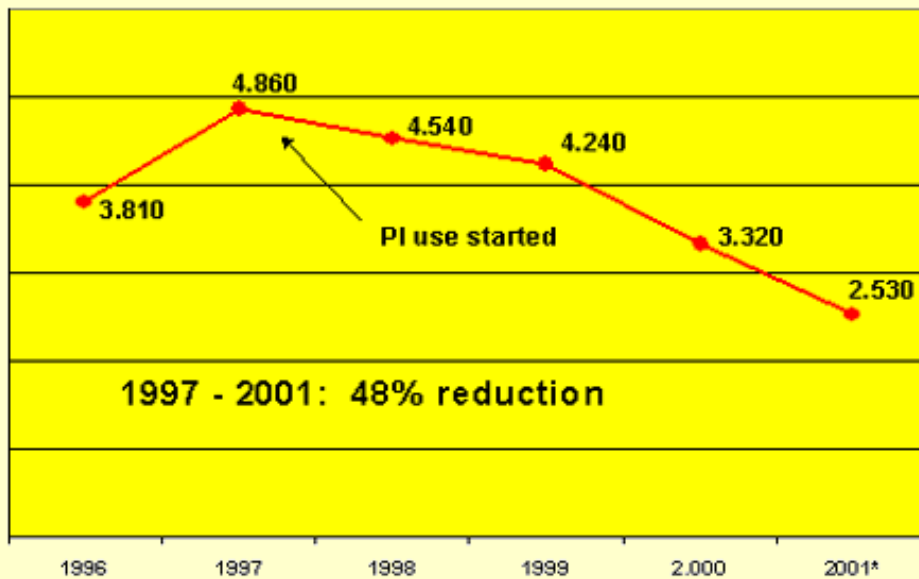
Mean cost (in US\$) of triple therapy (2 NTRI + NNRTI) per patient/year. Brazil, 1996 - 2001



* preliminary data - Source: Ministry of Health/Brazil

The mean weighted cost per patient/year on ARV therapy showed an increase between 1996 and 1997, associated with the beginning of PI distribution. In 2001, this cost should be 48% lower (US\$ 4,860 in 1997; US\$ 2,530 in 2001, according to preliminary data), in spite of the proportional increase in the number of patients using more complex and expensive therapeutic regimens.

Mean cost (in US\$) per patient/year on ARV therapy. Brazil, 1996 - 2001



* preliminary data - Source: Ministry of Health/Brazil

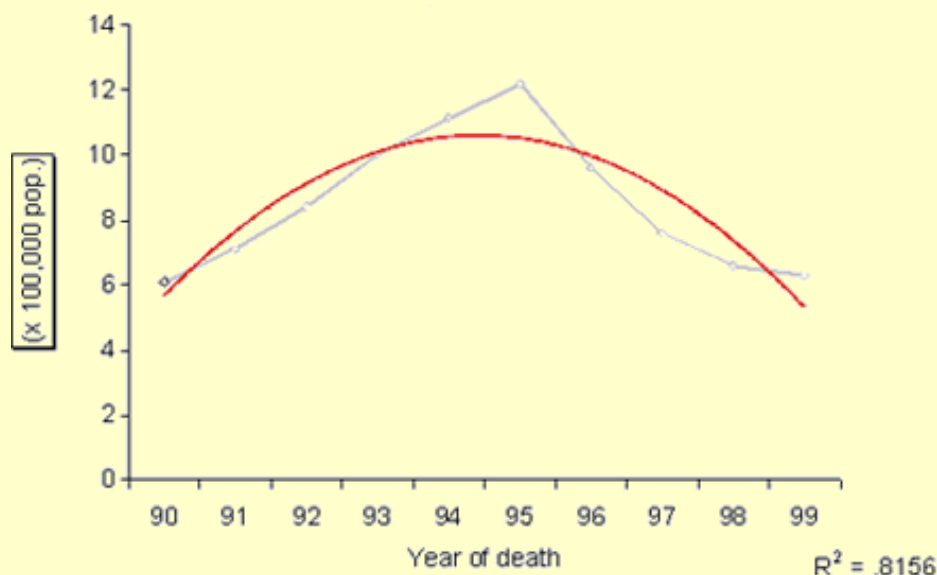
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Impact of the Antiretroviral Therapy Aderence to Antiretroviral Therapy

The policy of providing ARV drugs policy guarantees a longer survival for HIV+ individuals, minimising the impact of the epidemic on the population groups infected, particularly those in productive age ones. Moreover, the universal access program, together with other initiatives, such as the more widespread use of chemoprophylaxis for the main opportunistic infections and the different types of care available (Day Hospital and Home Care), has allowed a decrease in the need for hospital admissions, with a consequent reduction of costs, as well as a fall in the frequency of opportunistic infections. As for the decrease in deaths, a marked reduction in AIDS-related mortality has been observed in recent years. In 1995, the AIDS death rate was 12.2 per 100,000 population; in 1999, it had dropped to 6.3/100,000 population, a reduction of approximately 50%. In large urban centres such as São Paulo and Rio de Janeiro (which account for more than 31% of the known AIDS cases in the country), the decrease in mortality has been even more marked, of approximately 70% (SP - 54%, Rio - 73%) in the period 1995-2000 (data up to August 2000).

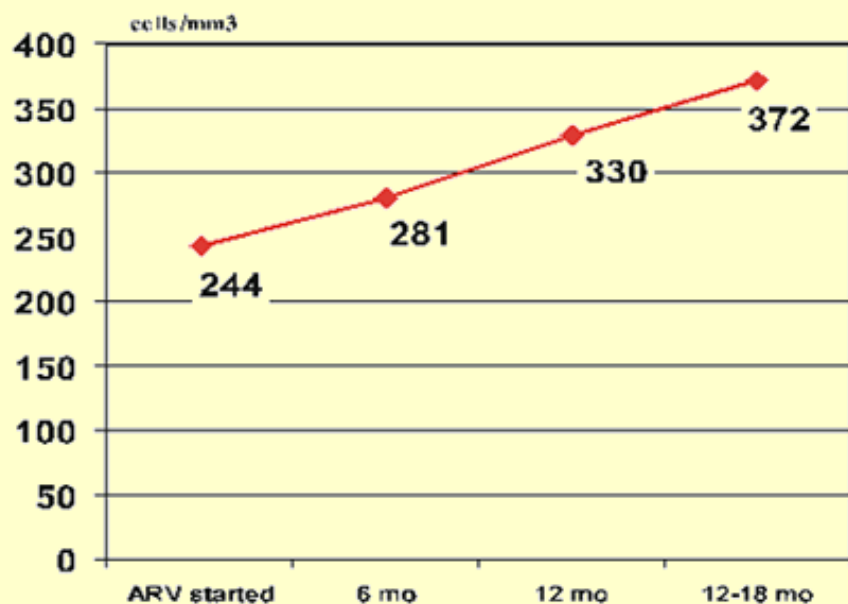
Trend of aids death rates. Brazil, 1990 - 1999



In addition, a 60-80% decrease in the frequency of the main opportunistic conditions associated with severe immunodeficiency in patients with HIV/AIDS, such as cryptococcosis (60%), CMV infection (54%) and Kaposi's Sarcoma (38%), has been observed in the major services caring for these patients. According to data from the Centre of Treatment and Reference in STD/AIDS of the São Paulo State Health Secretariat (CRT/AIDS-SP), new cases of tuberculosis in HIV+ individuals seen at this institution, a condition with an estimated risk approximately 800 times higher than in the general population, have decreased approximately 76% in the period 1996-2000.

Another figure reflecting the impact of the Brazilian policy of universal access to antiretrovirals is the phenomenon of partial immunological reconstruction promoted by the treatment. This is demonstrated by the evolution of the mean T CD4+ cell count in HIV+ patients on antiretroviral therapy. Recent MoH data show that after starting combined ARV regimens, mean cell counts rise progressively (from approximately 244 cells/mm³ at the beginning of treatment to 372 cells/mm³ after 18 months of treatment). This improvement seems to contribute significantly to the reduction in the frequency and severity of opportunistic conditions associated with HIV/AIDS and undoubtedly is an indicator of the better quality of life of HIV+ patients treated in the public health network.

Evolution of mean T CD4+ cell counts in HIV+ patients on ARV therapy in the Unified Health System. Brazil, April 1999 to October 2000



N= 6,288

Source: SIC LOM - CN-DST/AIDS, 2001

As to costs, some studies have shown that the price of antiretroviral therapy is largely offset by the reduction of costs with drugs for the treatment of opportunistic infections and with the ensuing hospitalisations. The analysis of data at the MoH has shown a significant drop in the number of hospitalisation/patient; it estimated that approximately 234,000 AIDS-related hospital admissions were prevented in the period 1997-2000, with US\$ 677 million savings for the Unified Health System. In the case of CMV infection, for instance, a condition affecting individuals at an advanced stage of HIV infection and that may cause blindness, data on the use of ganciclovir for its treatment show a 69% decrease in the period 1997_1999; in the past two years, this meant a savings of approximately US\$ 34 million.

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Adherence to antiretroviral therapy

Combined antiretroviral therapy not only contributes to a longer life span for HIV+ individuals but also to a better quality of life, directly related to a better physical and emotional status. These individuals, mostly in the economically active age group, remain productive and thus do not divert Social Security funds with illness aid, retirement pensions for disability reasons, and other such benefits.

It is clear that patient adherence to multiple doses therapeutic regimens is crucial to the clinical management of this disease, since non-adherence to antiretroviral treatment is directly linked to the development of viral resistance, the consequent therapy failure and the emergence of multiresistant viral strains.

A study carried out in São Paulo has shown that certain characteristics of users' groups are risk factors for non-adherence, particularly less than 4 years of schooling and lack of personal income.

The history of HIV+ individuals registers the overcoming obstacles, mainly those related to adjustments of lifestyle and issues pertaining to the stigma of the disease. One critical moment is the beginning of treatment, when the need to accept the condition and to establish a reliable rapport with the physician and the health services is clearly seen.

The health services have an extremely important role in overcoming treatment-related difficulties, and their dialogue and negotiation abilities are crucial.

Antiretroviral adherence in Brazil seems very similar to that seen in First-world countries. However, the rates achieved everywhere are still far from the desired levels. A study on adherence that defined it as taking 80% or more of the total prescribed doses has shown 69% adherence among more than one thousand patients interviewed. Similar studies carried out in Baltimore (202 patients), London (114 patients) and San Francisco (388 patients) demonstrated similar rates (60%, 75% and 78%, respectively).

Comparative results of ARV therapy adherence studies.

Site	Nº patients	% compliance	Adherence rate
São Paulo/Brazil	1141	80	69
Baltimore/USA	202	80	60
London/UK	114	80	75
San Francisco/USA	388	80	78
Madrid/Spain	366	90	57,6

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Co-operation Between Brazil and developing Countries

A considerable part of the success achieved by the Brazilian drug distribution program is due to the development of quality generic antiretroviral drugs by Brazilian manufacturing laboratories, at costs significantly below those practised in the international market. The Brazilian expertise in AIDS drug manufacturing was offered to developing countries, particularly in Africa, during the XIII International AIDS conference held in Durban, South Africa, in July 2000. In a spirit of co-operation and international solidarity, Brazil can currently promote the transfer of technology for the establishment of industrial ARV production poles. Such transfer includes technical support for the design and construction of the production plant, manufacturing of drugs as capsules and tablets (all produced in Brazil), training in quality control of raw materials and transfer of analytic methods. Some countries, like South Africa and Uganda, have shown an interest in obtaining the Brazilian technology and others, like Chile, Burkina Faso, Barbados and Guatemala, in direct drug purchase, through point co-operation actions.

Brazil has signed co-operation agreements with four Portuguese-speaking African countries (Angola, Mozambique-Guiné-Bissau and São Tomé and Príncipe). Seven other African countries have shown an interest in exchanges with Brazil _ Portuguese-speaking Cape Verde and English-speaking Namibia, Zimbabwe, South Africa, Kenya, Nigeria and Botswana.

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