



Country AIDS Policy Analysis Project

HIV/AIDS in Brazil

Oliver Bacon, MD, MPH
Maria Lúcia Pecoraro, MD
Jane Galvão, PhD
Kimberly Page-Shafer, PhD, MPH

AIDS Policy Research Center, University of California San Francisco

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Preface

The Country AIDS Policy Analysis Project is managed by the AIDS Policy Research Center at the University of California San Francisco. The project is funded by the U.S. Agency for International Development, Cooperative Agreement PHN-A-00-01-00001-00. Stephen F. Morin, PhD, is the project's principal investigator. The project received additional support from the International Training and Education Center on HIV (I-TECH), a collaboration of the University of Washington and UCSF funded through a cooperative agreement with the HIV/AIDS Bureau of the U.S. Health Resources and Services Administration. The views expressed in the outputs of the Country AIDS Policy Analysis Project do not necessarily reflect those of USAID or I-TECH.

The Country AIDS Policy Analysis Project is designed to inform planning and prioritizing of effective and equitable HIV/AIDS prevention and treatment interventions through multidisciplinary research on HIV/AIDS. The project evolved from the acute need for analysis of the epidemiology of HIV/AIDS in tandem with analysis of countries' political economy and sociobehavioral context—at household, sectoral, and macro levels. This multidisciplinary analysis aims to:

- help inform national HIV/AIDS policies
- strengthen ability to plan, prioritize, and implement effective interventions
- highlight the range of sectoral interventions that may affect or be affected by HIV/AIDS
- facilitate multisectoral/interministerial coordination
- facilitate intercountry information sharing
- increase national and subregional capacity for effective partnerships

The project develops and disseminates online analyses of HIV/AIDS in 12 USAID priority countries: Ethiopia, Kenya, Malawi, Senegal, South Africa, Uganda, Tanzania, Zambia, Zimbabwe, Brazil, Cambodia, and India
<<http://ari.ucsf.edu/ARI/policy/countries.htm>> Each analysis is linked with national strategic plans for HIV/AIDS prevention, care, and support. Analyses also include a comparative table of 63 key HIV/AIDS and socioeconomic indicators. The primary audience for the country analyses is in-country HIV/AIDS planners, including those from government ministries and agencies, multi- and bilateral donors, international and local NGOs, health care institutions, prevention programs, academia, affected communities, and the private sector. International investigators and policymakers also report using the analyses in their work.

All country analyses undergo peer review at the AIDS Research Institute of the University of California San Francisco. In addition, two in-country experts from each profiled country serve as peer reviewers. A scientific advisory board also reviews all analyses.

Acknowledgments

The following individuals served as peer reviewers and provided valuable inputs to this paper: Dr. George W. Rutherford, interim director, Institute for Global Health, and head, Division of Preventive Medicine and Public Health, University of California San Francisco; and Dr. Francisco Inácio Pinkusfeld M. Bastos, researcher, Centro de Informação Científica e Tecnológica, Departamento de Informações em Saúde, Fundação Oswaldo Cruz, Rio de Janeiro, Brazil. They are not responsible for any errors of fact or judgment.

Epidemiology

Overview

Brazil comprises 26 states and one federal district (Brasília). States are grouped into regions as follows:

Figure 1. Brazilian Regions and States

Region	States	State Capital
South	Rio Grande do Sul	Porto Alegre
	Santa Catarina	Florianópolis
	Paraná	Curitiba
Southeast	São Paulo	São Paulo
	Rio de Janeiro	Rio de Janeiro
	Minas Gerais	Belo Horizonte
	Espírito Santo	Vitória
Center	Mato Grosso	Cuiabá
West	Mato Grosso do Sul	Campo Grande
	Goiás	Goiânia
	Distrito Federal	Brasília
North	Amazonas	Manaus
	Acre	Rio Branco
	Roraima	Boa Vista
	Rondônia	Porto Velho
	Amapá	Macapá
	Para	Belém
	Tocantins	Palmas
Northeast	Bahia	Salvador
	Alagoas	Maceió
	Sergipe	Aracaju
	Pernambuco	Recife
	Paraíba	João Pessoa
	Rio Grande do Norte	Natal
	Ceará	Fortaleza
	Piauí	Teresina
	Maranhão	São Luis

Source: Government of Brazil.



In 2002, UNAIDS and the Brazilian Ministry of Health (MoH) estimated that there were 610,000 Brazilians living with HIV/AIDS at the end of 2001, with adult prevalence at 0.7 percent.[2]. This estimate is subject to considerable variation, however, as HIV infection, unlike AIDS, is not a reportable condition in Brazil.

In July 2004, UNAIDS released revised country-level data, estimating that there were 660,000 Brazilians living with HIV/AIDS at the end of 2003, with adult prevalence at 0.7 percent (UNAIDS, 2004 *Report on the Global AIDS Epidemic*. 2004: Geneva <<http://www.unaids.org/>>). (See the section on UNAIDS Estimates below for more detail.)

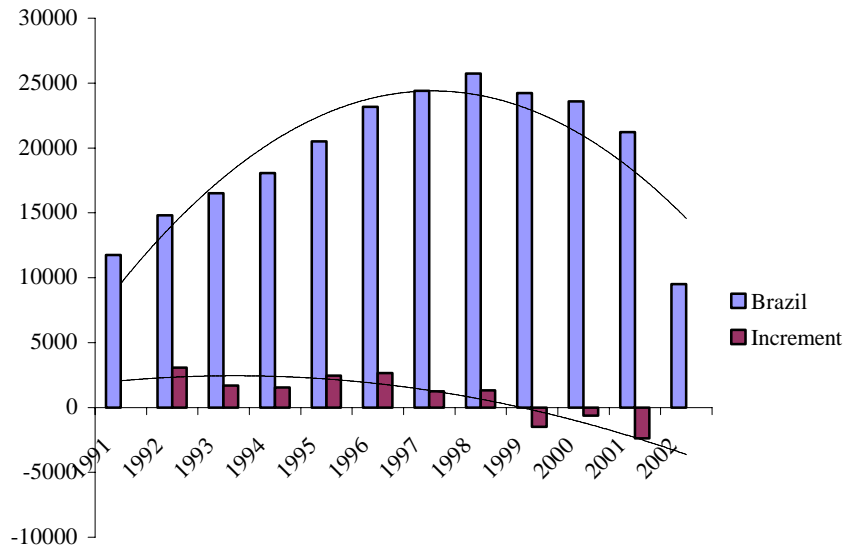
According to UNAIDS, the HIV/AIDS epidemic in Brazil appears to be stabilizing. Since 1999, all regions but the South have experienced a decrease in incidence of newly reported AIDS cases [3]. The incidence of AIDS has remained stable over the last five years at around 20,000 new cases per year through 2001, the most recent year with complete reporting [4]. HIV prevalence also appears to be stabilizing across all sentinel surveillance studies conducted in the last four years, although seroprevalence studies are marred by incomplete collection of data and methodological inconsistencies (see below).

Surveillance of the HIV/AIDS epidemic in Brazil has relied on mandatory AIDS case reporting, rather than HIV prevalence or incidence studies. Although helpful in allocating resources for patient care, case-based surveillance is of limited usefulness in directing prevention efforts, in comparison to HIV incidence, as:

1. Infection precedes the appearance of symptomatic disease by 8-10 years [1].
2. The widespread availability of highly active antiretroviral therapy (HAART) in Brazil since 1996 has further delayed progression to disease [5].

The AIDS case definition was revised in 1997 to include a CD4+ T-cell count less than 350 in the absence of clinical symptoms, resulting in an increase in case detection [6]. The Brazilian MoH maintains AIDS case information in an electronic database (SINAN), which is updated annually; nevertheless, dissemination of this information lags its collection by approximately two years [7] (as an example, some 36,000 to 50,000 AIDS cases had been diagnosed but not yet officially registered as of February 1999 [8]). Some data from 1999 also suggest underreporting rates of approximately 42.7 percent [9]. According to SINAN, annual AIDS incidence peaked in 1998, with 25,742 cases reported. Officially there were 277,141 cumulative reported cases as of September 2003 [10]. AIDS case incidence during 2001-2002 stood at 15.2/100,000 persons (19.3/100,000 men and 11/100,000 women) [11].

Figure 2. AIDS Cases, by Year of Diagnosis, 1991-2002



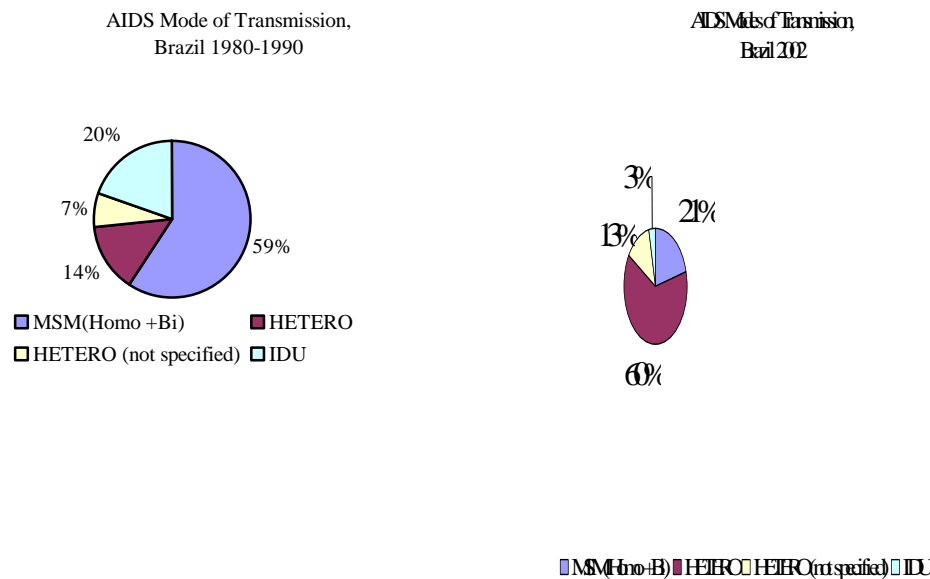
Source: Brazilian Ministry of Health. [Boletim Epidemiológico - Abril a Dezembro 2002] - Table 1. 2002, CN-DST AIDS - Epidemiology Unit.

Transmission Patterns

Based on AIDS case reporting, the HIV/AIDS epidemic has moved from men to women, from homosexual acquisition to heterosexual acquisition, from socioeconomically more-advantaged to less-advantaged groups, and, to a lesser degree, from the cities of the industrialized Southeast into other parts of the country. AIDS case reporting in the last five years indicates at least a stabilization, and possibly a decline in disease incidence, probably the result of the widespread availability of HAART since 1996 (see the Impact and Response sections below) [11]. Apart from universal access to HAART, other factors responsible for a decreased incidence of AIDS may include saturation of core groups and continuous prevention initiatives targeting high-risk populations [12].

Shift from Homosexual to Heterosexual Transmission

AIDS case reporting from the early years of the epidemic (1980- 90) shows a concentration of disease among men who have sex with men (MSM, including both homosexual and bisexual men) [13] (figure 3).

Figure 3. Modes of Transmission

Source: Brazilian Ministry of Health, National HIV/AIDS/STD Program (Programa Nacional de DST/AIDS), 2002 [10].

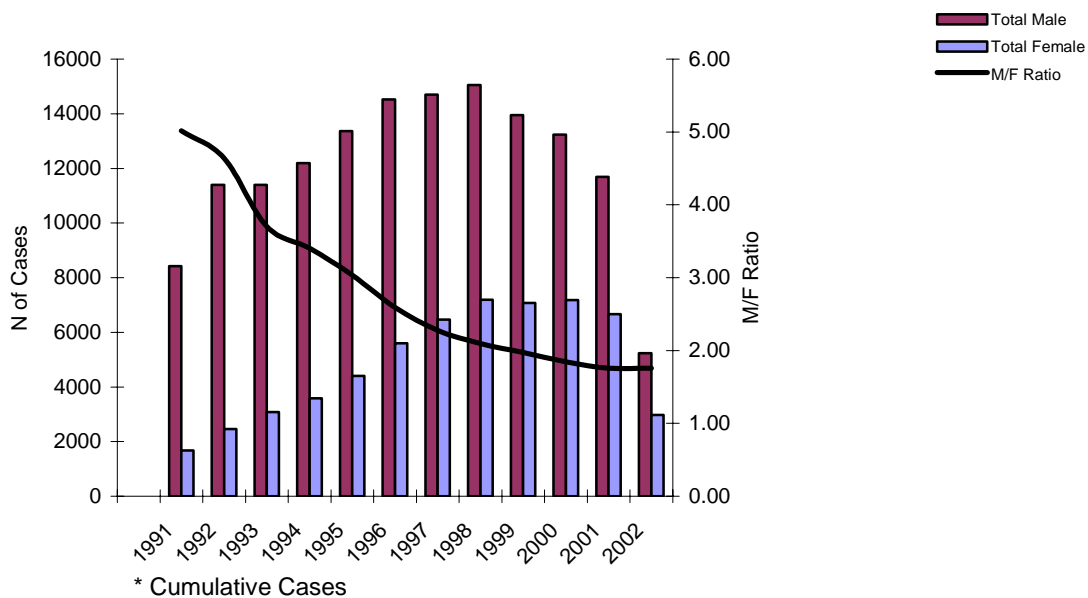
Since that time, there has been a shift towards heterosexual transmission [11, 14, 15], particularly to women in stable relationships with bisexual or injection drug-using male sexual partners [16]. From 1980 until 1996, MSM (both homosexual and bisexual) accounted for 32.7 percent of AIDS cases; IDU for 21.4 percent (17.4 percent male and 4 percent female); and heterosexual transmission for 18.2 percent (9.6 percent male and 8.6 percent female). The year 1993 was the first in which the proportion of new AIDS cases attributable to heterosexual transmission (30.2 percent) surpassed the proportion attributable to homosexual transmission (28.6 percent). During 1998, at the peak of AIDS incidence, the proportion of cases attributable to heterosexual transmission had risen to 47.8 percent; the proportion of cases attributable to MSM had dropped to 22.4 percent; and IDU accounted for 13.3 percent of cases. In 2001, the most recent year for which complete figures exist [10], heterosexual transmission accounted for 59.4 percent; MSM for 18.5 percent; and IDU for 8.0 percent. (See also the Brazilian Ministry of Health's website: <<http://www.aids.gov.br>>.) Among women diagnosed with AIDS between 1998 and 2002, the most prevalent risk factor for infection was sex with multiple partners (45 percent), followed by sex with an IDU or known HIV-positive partner. Transmission via unsafe blood/blood products decreased from 3.7 percent of the total up to 1996, to 0.12 percent in 1998.

Injection Drug Users (IDUs)

The incidence of AIDS among IDUs is declining [14, 15]. The national government began implementing a needle exchange program between 1994 and 1998 [17, 18]. Between 1999 and 2000, about 150,000 syringes were exchanged; preliminary results from this program showed a reduction in the prevalence of HIV among IDUs from 63 to

42 percent during seven years of observation [18]. A study conducted in Santos, a port city in São Paulo State, among drug users showed that HIV prevalence declined during a period when the preferred method of cocaine administration shifted from injecting cocaine to smoking crack, suggesting that needle-sharing had been contributing to the epidemic [19]. In areas such as the southern part of the country, where injection is the preferred route of administration, AIDS incidence has tended to mirror rates of drug injection [20]. Epidemiologically, increased incidence of AIDS among IDUs is usually followed by a “wave” of sexually transmitted AIDS among their sexual partners, particularly women [20].

Figure 4. Male-to-Female Ratio of AIDS Cases, 1980-2002



Source: Brazilian Ministry of Health, National HIV/AIDS/STD Program (Programa Nacional de DST/AIDS), 2002 [10].

Male-to-Female Ratio of AIDS Cases, and Maternal-Child Transmission

Overall, the male-to-female ratio among AIDS cases declined from 24:1 in 1985 to 2:1 in 2002. The proportion of cases due to mother-to-child transmission remained roughly constant until 1999, accounting for 3-4 percent of cases; it fell to 1.7 percent in 2001 [4].

Socioeconomic Shifts: Expansion of the Epidemic into Less-educated Segments of the Population

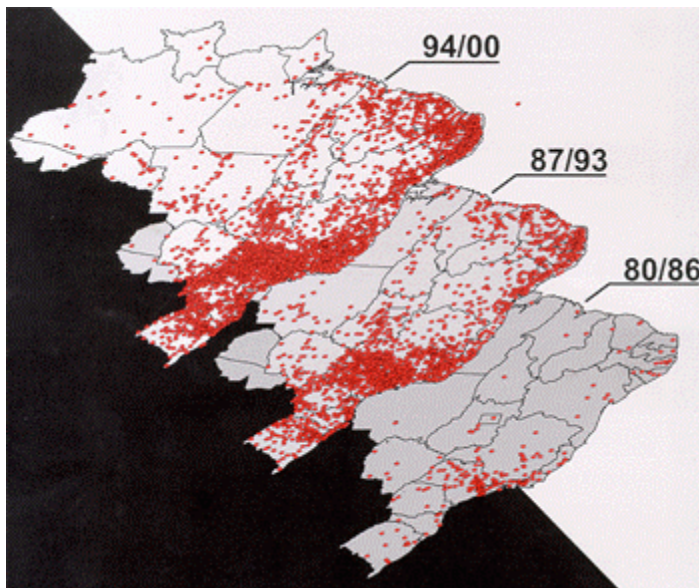
Since the early years of the epidemic, there has been a shift in the distribution of AIDS cases from more- to less-educated members of the population. In 1983, 50 percent of cases had completed university, whereas 25 percent had completed elementary school only. By 1998, 70 percent of cases had completed elementary school only, whereas less

than 25 percent had a university education [21, 22]. Pauperization of the epidemic since the introduction of HAART may, however, reflect decreased access to treatment by economically marginalized groups.

When analyzed by labor market participation, 89 percent of male AIDS cases between 1991 and 1998 were reported among actively working men [23]. Nevertheless, although working men presented the highest incidence of AIDS, the annual rate of increase of case incidence was higher among nonworking men (18.9 percent) than among working men (8.6 percent) [23]. Among women, during the same period, the majority of cases (66 percent) were among nonworking women [23]. Nonworking women also presented the highest annual rate of increased AIDS case incidence [23].

Since 1990, the year by which virtually all states in Brazil had reported at least one case of AIDS, there has been an increase in the number of cases detected outside the Southeast, where the bulk of the disease burden remains [24]. Figure 5 shows the dissemination of AIDS cases from the industrial cities of the Southeast, where the epidemic was first detected in the 1980s, to Central and Northeastern regions.

Figure 5. Geographic Spread of AIDS Cases per Six-Year Interval, 1980-2000

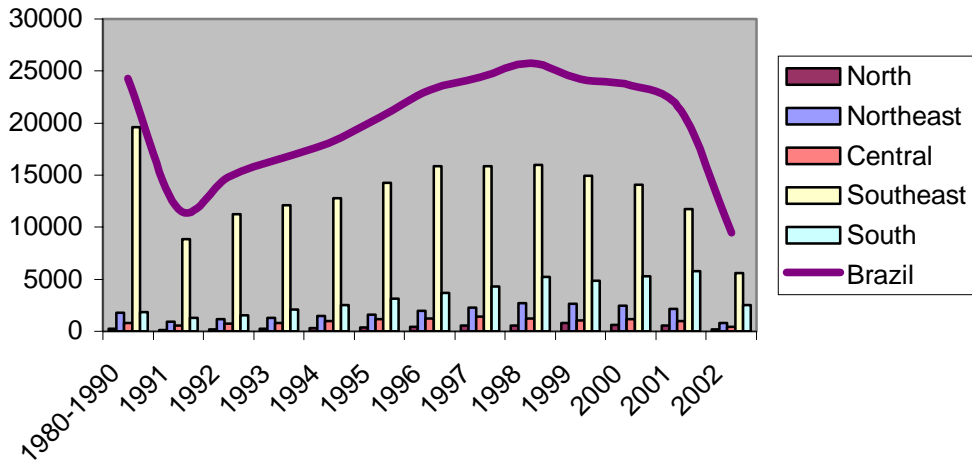


Note: Each red dot represents a municipality of at least 30,000 inhabitants with at least one reported case of AIDS.

Source: Brazilian Ministry of Health, National HIV/AIDS/STD Program (Programa Nacional de DST/AIDS), 2000.

AIDS Case Incidence

As mentioned above, since 1998, all regions except the South have experienced a decrease in incidence of newly reported AIDS cases. [3] The incidence of AIDS has remained stable over the last five years, averaging around 20,000 new cases per year [4].

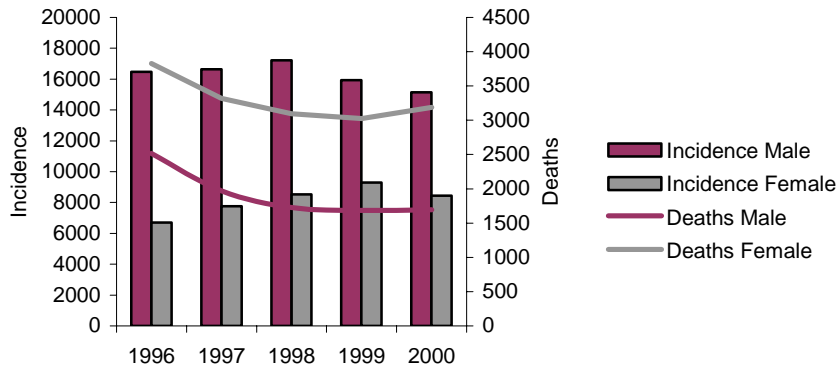
Figure 6. AIDS Case Incidence by Region, 1980-2002

Source: Brazilian Ministry of Health, National HIV/AIDS/STD Program (Programa Nacional de DST/AIDS), 2002 [10].

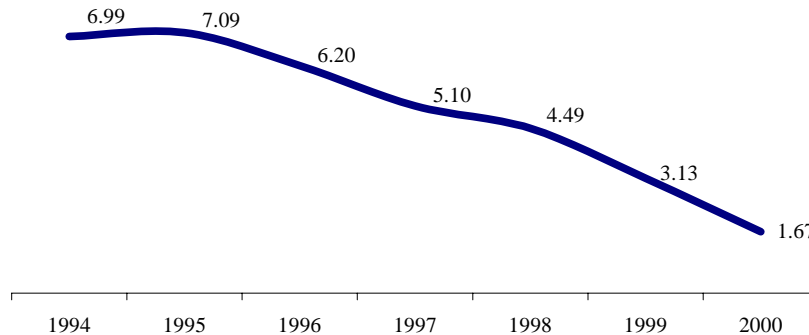
AIDS Mortality

See also the UNAIDS Estimates and Impact sections below.

As shown in figures 7 and 8, cumulative AIDS incidence and mortality data, by sex, since the mid-1990s show peak incidence in men in 1998, followed by women in 1999. Death rates due to AIDS have fallen substantially in both sexes since the widespread introduction of prophylaxis and treatment for opportunistic infections (pre-1997) and effective antiretroviral therapy (in 1997) [25]. In 1994 women were more likely to die of AIDS-related causes than men, with a male-to-female ratio close to 3:1 [25].

Figure 7. AIDS Incidence and Associated Deaths, Male and Female, 1996-2000

Source: Datasus/FUNASA/CENEPI-SIM/Bol Epidemiol; MS/SVS/DASIS - Sistema de Informações sobre Mortalidade - SIM.

Figure 8. AIDS Mortality/100,000 Inhabitants

Source: Datasus/FUNASA/CENEPI-SIM/Bol Epidemiol; MS/SVS/DASIS - Sistema de Informações sobre Mortalidade - SIM.

Sexually Transmitted Infections (STIs)

In 1997 Brazil's Ministry of Health, through its STI-AIDS control program, launched an STI surveillance system. Results have been compromised by understaffing and inconsistency in standardizing diagnostic procedures and results [26]. In addition, because STI reporting in Brazil is not mandatory, rates are likely to be underestimated. Figures from 2001 are summarized in table 1 below.

Table 1. Prevalence and Estimated Incidence of STIs in Brazil, 2001

Pathogen (Disease)	Prevalence (%)	Incidence (%)
Human Papilloma Virus	15.2	0.8
Herpes Simplex Virus II	12.6	0.8
Treponema Pallidum (Syphilis)	2.06	1.1
Trichomonas Vaginalis	3.4	5.1
Neisseria Gonorrhea	0.71	1.8
<i>C. Trachomatis</i>	1.92	2.3

Source: Moherdaui, F, Aspectos Epidemiológicos das DST no Brasil. PN DST AIDS, 2003.

HIV Sentinel Surveillance and Seroprevalence Studies

Individual Studies

The first seroprevalence studies in Brazil involved individual projects undertaken in the early 1990s [27-32], using several different sampling methodologies and concentrated on populations in the Southeast [33]. They are summarized in table 2:

Table 2: Individual Seroprevalence Studies

Author	Year	Material & Methods	Results
Amaral [28]	1991	Umbilical cord samples; 5815 samples collected, 5101 analyzed	0.4% prevalence
Vasconcelos [27]	1988-1990	307 males reporting homo and bisexual behavior	68/307 (22%) HIV-positive.
Kallas [29]	Dec 1993-Jan 1994	Samples from 766 male inmates.	105 (14%) HIV-positive; 24 HIV-indeterminate; 637 (83%) HIV-negative.
Osti [30]	1995	693 sera samples from male inmates	100/693 (14%) ELISA+; 97/100 confirmed WB+.
Catalan-Soares [31]	Not Available	Blood samples from 63 male inmates.	1/63 (1.6%) tested HIV1/2 positive (ELISA and WB).
Reiche [32]	Jun 1996-Jun1998	1473 samples collected at the very first pre natal visit	0.6 % HIV-positive.
Miranda [34]	1999	1608 low-mid income women attending a public antenatal clinic in Vitória, Espírito Santo State	0.8% HIV-positive

Vulnerable Populations: Street Youth and Indigenous Peoples

Between December 1994 and April 1995, 1,122 young males and 93 young females institutionalized for homelessness or having committed minor crimes were tested for HIV. Average age was 16.2 years (range 12 – 21), and the majority had less than a fourth grade education (62 percent). Ninety-one percent reported having been sexually active; 12% percent reported at least one STI; and 42 percent of females reported at least one

pregnancy. The vast majority acknowledged use of illicit drugs (cannabis: 84 percent; cocaine: 63 percent; crack-cocaine: 56 percent). Overall seroprevalence was 3.2 percent. Females were more likely to test positive than males (10.3 percent for females and 2.6 percent for males, $p=0.001$) [35]. Disadvantaged youth have subsequently been targeted for enhanced prevention interventions, but follow-up studies are not available.

The indigenous population is estimated at 350,000, distributed among 210 different villages, speaking 170 different languages [36]. As of 2000, 36 cases of HIV infection among indigenous populations had been reported to the MoH [37]. HIV threatens most of the indigenous communities in Brazil. [38]. Their proximity to cities, military facilities, and mining camps facilitates the spread of HIV infection to indigenous populations [38]. The movement of the HIV epidemic from coastal cities toward inland areas is of concern as it may increase indigenous communities' vulnerability to acquiring HIV. Also, the increasing social breakdown of these communities, caused by drug trafficking, sex work, and media introduction, may facilitate the spread of HIV, as may particular practices regarding social organization, sexual behavior, and concepts about the body [38].

Since August 1999, the Brazilian Ministry of Health, through National Health Foundation (*Fundação Nacional de Saúde*, or FUNASA) has assumed responsibility for structuring a health care system for the indigenous population through the National Health System (*Sistema Unversal de Saude*, or SUS) [36]. A system for tracking health care indicator data among this population is being implemented (Sistema de Informações de Saúde Indígena – SIASI) [36].

Sentinel Surveillance Program

In May 1992, Brazil's MoH implemented a program to track regional and temporal patterns in HIV infections (HIV Sentinel Surveillance Program). Anonymous serologic testing was performed on blood collected every six months from patients at low-risk (those attending prenatal clinics and hospital emergency wards) and high-risk (STI clinics) sites. Sites had to be able to collect, process, and store blood samples, and the blood had to have been collected for medical reasons other than HIV testing.

A summary of the results from what became known as the first phase of the MoH HIV Sentinel Surveillance Project in Brazil was released in 1998 and covers collection and analysis from 1992-97. Interpretation of data from this period is limited due to the failure of sites to collect and report data at all time points in all regions.

Table 3. Seroprevalence among Women Attending Antenatal Clinics, 1992-97

Region	Sample	Prevalence (%)
North	450	0.2
Northeast	2,365	0.45
Southeast	3,354	0.53
South	2,925	1.95

Source: Ministry of Health / SPES / National Program STD/AIDS.

Table 4. Seroprevalence among STI Patients, 1992-96

Region	Sample	Prevalence (%)
North	444	1.65
Northeast	900	3.3
Central	1,501	2.05
Southeast	2,742	10.03
South	2,240	4.37

Source: Ministry of Health / SPES / National Program STD/AIDS.

Table 5. Seroprevalence among Patients Attending Trauma Centers, 1996 -97

Region	Sample	Prevalence (%)
Southeast	534	5.15

Source: Ministry of Health / SPES / National Program STD/AIDS.

Following completion of this first phase of serosurveillance in 1997, the National HIV/AIDS/STD Program (*Programa Nacional de DST/AIDS*, or PN-DST/AIDS), piloted a program to enhance the tracking of HIV prevalence, expanding sentinel surveillance to 150 sites distributed throughout the country [26] with systematized collection of 200 samples from each site during an 8-week period every six months.

Results of the second phase of HIV surveillance from 1997-99 were published in the MoH Epidemiological Bulletin released in early 2001. Although prenatal clinics, emergency wards, and STI clinics were sampled, only the results from emergency wards and STI clinics were published (see table 6). Limitations include heterogeneity of reporting by site and year, as well as possible overestimation of prevalence, as many of the reporting sites were reference centers for HIV testing [33]. These methodological issues limit the usefulness of these data for program planning and evaluation.

Table 6. Estimate of HIV Infection, by Sex, Age Group and Sentinel Group, 1997-1999

Sentinel Group	Age Group	Year	Male			Female			M/F Ratio
			Proportion (%) Infected	95% CI		Proportion (%) Infected	95% CI		
				Lower Limit	Upper Limit		Lower Limit	Upper Limit	
Patients attending STI Clinics	13-29 year-old	1997	6.08	5.06	7.1	4.75	4.03	5.77	1.28
		1998	5.22	4.41	6.03	2.96	2.49	3.77	1.76
		1999	4.18	3.46	4.9	2.41	1.98	3.13	1.73
	30 – 49 years-old	1997	8.14	6.73	9.55	3.13	2.42	4.54	2.6
		1998	7.63	6.48	8.78	4.16	3.48	5.31	1.83
		1999	5.39	4.43	6.35	2.38	1.85	3.34	2.26
	13-49 years-old	1997	6.92	6.09	7.75	4.25	3.73	5.08	1.63
		1998	6.34	5.66	7.02	3.4	3.01	4.08	1.86
		1999	4.71	4.13	5.29	2.34	2.01	2.92	2.01
Patients seen in Emergency Rooms	13 – 29 years-old	1997	6.61	5.6	7.62	3.16	2.53	4.17	2.09
		1998	3.97	3.27	4.67	1.83	1.41	2.53	2.17
		1999	2.93	2.33	3.53	1.68	1.29	2.28	1.74
	30 – 49 years-old	1997	5.87	5.09	6.65	3.28	2.71	4.06	1.79
		1998	3.83	3.26	4.4	1.68	1.33	2.25	2.28
		1999	4.29	3.72	4.86	2.45	2.03	3.02	1.75
	13-49 years-old	1997	6.09	5.48	6.7	3.16	2.74	3.77	1.93
		1998	3.85	3.41	4.29	1.73	1.46	2.17	2.23
		1999	3.77	3.35	4.19	2.08	1.79	2.5	1.81

Source: Szwarcwald, C L et al. HIV Sentinel Surveillance Project: Results from STIs Clinics and Emergency Rooms, 1997-99 [39].

Additional Seroprevalence Data: Antenatal Clinics, Drug Injectors, and Sex Workers

In 2000, the MoH collected 16,477 samples from 140 antenatal clinics (ANCs) for analysis. The national HIV prevalence in ANCs was 0.61 percent. When stratified by population, the prevalence in cities with over 1 million inhabitants was 1.25 percent. In cities with populations between 500,000 and 1 million, prevalence was 0.34 percent. Cities with populations between 200,000 and 500,000 had a prevalence of 0.46 percent; municipalities with populations of 50,000-200,000, a prevalence of 0.50 percent; and among cities with fewer than 50,000 inhabitants, 0.22 percent [40].

A 2001 study on 869 injection drug users in five urban areas found a median prevalence of 36.9 percent. A study of sex workers conducted in 2000 with 2,712 women in eight cities found a median HIV prevalence of 6.1 percent [40].

Seroincidence Studies

There is not yet a national system for tracking seroincidence in Brazil; however, several individual studies have been undertaken in a number of risk groups. A study of injection

drug users in Rio de Janeiro reported an HIV-1 incidence of 26.9 percent (46 out of 171 samples) [41]. In Porto Alegre, a sample of 138 HIV-negative cocaine users followed for 18 months yielded 8 seroconversions, for an incidence rate of 5.03/100 person-years (py) at risk [42]. A prospective study conducted in Rio de Janeiro among MSM showed a seroincidence of HIV of 3.1/100 (py) [43, 44]. The same group also tested samples of heterosexual men and women, finding an incidence of 2.8/100 py and 1.9/100 py, respectively [45]. A study in Santos tested 7,794 samples anonymously collected between 1996 and 1999. Of these, 555 tested positive for HIV, for an overall prevalence of 7.1 percent. Prevalence among men was higher than women (9.1 vs. 5.1 percent). Using the sensitive/less sensitive serologic algorithm (STAHRS), incidence among participants in this study was estimated at 2.0 percent, or 1.2 percent among women and 2.7 percent among men [46].

Summary Statement Regarding Serosurveillance to Date

As mentioned above, methodological limitations impede drawing conclusions about HIV surveillance in Brazil. Nevertheless, from the above data it appears that, based on regional seroprevalence among women attending ANC as well as among male and female patients at STI clinics, HIV infections seem to be concentrated in the South and Southeast. In addition, HIV prevalence appears to be relatively high but declining among young STI clinic and emergency room patients sampled in the mid-late 1990s.

UNAIDS Estimates

As mentioned above, in 2002, UNAIDS estimated that there were 610,000 Brazilians living with HIV/AIDS at the end of 2001, with adult prevalence at 0.7 percent.[2]. This estimate is subject to considerable variation, however, as HIV infection, unlike AIDS, is not a reportable condition in Brazil.

In July 2004, UNAIDS released revised country-level data, estimating that there were 660,000 Brazilians living with HIV/AIDS (estimate range: 320,000 - 1,100,000) at the end of 2003. Of them, 650,000 were adults, with adult prevalence at 0.7 percent. Among adults with HIV/AIDS, 240,000 (36.9 percent) were women. UNAIDS also estimated that there were 15,000 adult and child AIDS deaths in Brazil during 2003 (UNAIDS. *2004 Report on the Global AIDS Epidemic*. 2004: Geneva <<http://www.unaids.org/>>).

Data Quality Issues

A study carried out in Rio de Janeiro by Cruz et al. analyzed the HIV/AIDS notification system currently in place [48]. The data feeding the epidemiological system in Brazil originate from case reports conforming to the national AIDS case definition, which has been successively updated, most recently in 1997 [6]. The authors emphasize the lack of surveillance of HIV infection, the reliability of data, and the inconsistency of local data consolidated within the national system [48]. A study conducted in Rio de Janeiro to compare the two notification systems in place (Hospital Information System – SIH-SUS and *Sistema de Informação de Agravos de Notificação* / Notifiable Disorders Information

System, or SINAN) showed a high level of underreporting (42.7 percent) [9]. Proposed reasons for this were the multitude of forms used for reporting, as well as confusion regarding current AIDS case definitions[48]. Moreover, there is an average time lag of 30 months from AIDS diagnosis to data entry into the national database [7]. Because HIV infection reporting is not mandatory, the data entered in the surveillance system do not reflect the real HIV prevalence or incidence [49]. These limitations hamper the effectiveness of the reporting system as a means of tracking the epidemic [48].

Political and Sociobehavioral Context

Overview of Population

In mid-2003, Brazil had 176.5 million inhabitants—the world's fifth-largest population [50]—living in an area of 8.5 million km². Forty-five percent of the population is descended from West African slaves brought to the country between the mid-17th and late 19th centuries to work on the sugar plantations and in the gold mines. The Brazilian Institute for Geography and Statistics (IBGE), the organization responsible for the national census, recognizes five categories or ethnicities in Brazil: White, Black, Asian, *Pardo* (also defined as *Caboclo*, *Mulato*, *Cafuzo*, *Mameluco ou Mestiço*), and Indigenous [51].

The Afro-Brazilian or *Pardo* population is particularly concentrated in the nine states of the Northeast region, which have the lowest socioeconomic and health indicators in the country. Another 45 percent of the population is descended from the original Portuguese colonists and successive waves of immigrants from southern Europe and Germany in the late 1800s (when slavery was abolished and labor was needed to work in the new coffee plantations) and early to mid-20th century (white). The remaining 10 percent of the population is largely Asian (São Paulo has the highest Japanese population of any city outside Tokyo). Indigenous peoples make up less than 1 percent of the current population, mainly in the Amazonian north. Despite these discrete ethnic origins, the large amount of intermarriage among groups has given modern Brazil a highly blended society and popular culture. Although Brazil is said to have the largest Catholic population of any country in the world, Brazilian Catholicism is intermixed with West African and indigenous religious traditions, giving rise to cults such as *Umbanda* and *Candomblé*, which are widely practiced in the northeast state of Bahia, as well as in the urban southeast. Brazil is monolingual (Brazilian Portuguese) [52].

Brazil is highly urbanized, with 75 percent of the population living in the coastal cities of the Southeast and Northeast, and the remainder divided evenly among the Amazonian North, mountainous West, and South. Women make up 51 percent of the population. Approximately 75 million people (44 percent) are between ages 20 and 50. Fifty-three million are younger than 15 years [50], and 3.2 million less than one year [51]. Population growth has slowed over the past 50 years [53], from 2.99 percent between 1950-1960 to 1.64 percent in 1991-2000. The current rate is 1.3 percent [50]. Fertility has been in decline since 1960 (see table 7 below) [53]. In mid-2002, the total fertility rate was 2.2 [50].

Table 7: Total Fertility Rate among Brazilian Women 1940-2000

Region	1940	1950	1960	1970	1980	1991	2000
Brazil	6,2	6,2	6,3	5,8	4,4	2,9	2,3
North	7,2	8,0	8,6	8,2	6,4	4,2	3,2
Northeast	7,2	7,5	7,4	7,5	6,2	3,7	2,6
Southeast	5,7	5,5	6,3	4,6	3,5	2,4	2,1

South	5,7	5,7	5,9	5,4	3,6	2,5	2,2
Central	6,4	6,9	6,7	6,4	4,5	2,7	2,2

Source: [50, 54]

Fertility among adolescents stabilized during the 1990s after rising throughout the 1970s and 1980s. In 1995, 13 percent of women ages 15-19 had already given birth. However, adolescent fertility is highest—and increasing—in the North and Northeast, at 24 percent. Fifty-four percent of female adolescents with one year of schooling are mothers, in contrast to only 4 percent among those with 9-11 years of schooling [55].

The Brazilian population is aging. By the mid-1980s, younger age groups were no longer in the majority. Rather, from 1992 to 2001, the proportion of the population that was under age 10 fell from 22.1 to 18.7 percent, whereas the proportion of people older than age 60 increased from 7.9 to 9.1 percent [51].

Population Mobility

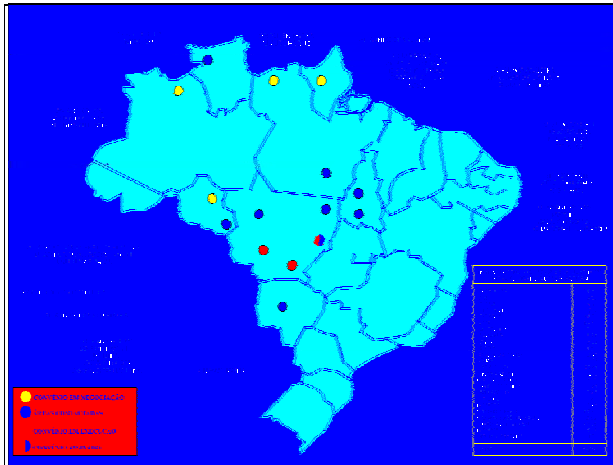
Internal migration is widespread, with 41 percent of the population living in a community other than that of their birth and 16 percent living in a different federal state. The Northeast clearly reflects the exodus of the male population toward better economic opportunities in the Southeast, leaving wives (so called “Women of the Drought”) and children behind. Eventually some these men return to their birthplace. Many remain in the Southeast [51, 54].

There is also temporary internal migration, with implications for HIV transmission, in the form of commercial trucking routes. The vulnerability of truck drivers to HIV infection was evaluated by questionnaire in a study conducted in Santos among 279 truck drivers. The vast majority (93 percent) reported a stable partner. Forty percent engaged in casual sex with female partners, and 19 percent reported having sex with another regular partner [56]. Inconsistent use of condoms among this population and long periods away from home are factors that contribute to their vulnerability to HIV infection [56].

Indigenous Populations

The indigenous population in Brazil is estimated at 350,000, of whom 280,000 (80 percent) live in villages distributed in reserves (*Terras Indígenas*), occupying about 11 percent of the national territory. Sixty percent of indigenous peoples live in *Terras* in the North and Central regions. The remaining 40 percent are dispersed in small areas in the South, Southeast, and Northeast. Many of these lands are not yet officially regulated or delimited [38, 57].

Figure 9. Distribution of Recognized Indigenous Reserves



Source: Brazilian Ministry of Health, National HIV/AIDS/STD Program (Programa Nacional de DST/AIDS <<http://www.aids.gov.br/prevencao/link220.htm>>.

The indigenous population living in urban areas is estimated at approximately 50,000, with the greatest concentrations in the cities of Manaus and Manacapuru (Amazonas), Campo Grande and Dourados (Mato Grosso do Sul), and Águas Belas (Pernambuco). Lesser concentrations are found in other metropolitan regions such as São Paulo, Porto Alegre (Rio Grande do Sul), Brasília, Chapecó (Santa Catarina), and Londrina (Paraná). Migration to and settlement in major urban areas varies enormously, from temporary movements for health care, work and education, to relocations rooted in the individual mores and practices of certain indigenous cultures, resulting in the presence of sizable Indian population groups in urban areas. Of note are the urban areas bordering other countries, such as the regions of Tabatinga-Benjamim Constant (border among Brazil, Peru and Colombia); Rio Branco (border with Bolivia); Boa Vista (the Guianas); Guajará-Mirim (Bolivia); Corumbá (Bolivia); and Foz do Iguaçu (Paraguay) [58].

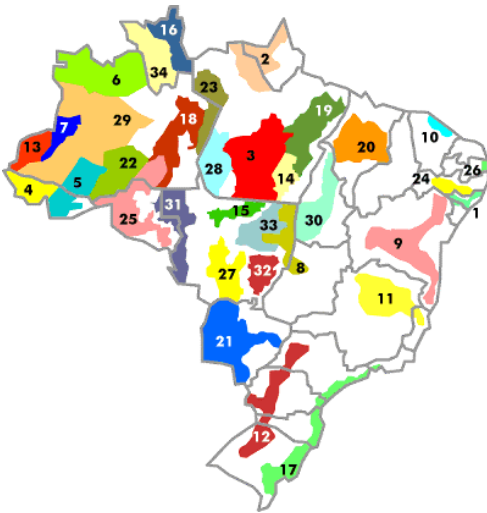
HIV/AIDS is an emerging issue among indigenous peoples in Brazil [58]. Miners who travel between southern Venezuela and Brazil are believed to have introduced HIV/AIDS in areas close to the Venezuela border through sex with local women (either via sex work or rape). Indigenous women of certain ethnic groups are at the same or greater risk as the spouses of miners, because of rape and prostitution. Many different social and economic arrangements exist between indigenous women and migrants to their areas. Having temporary wives is one such arrangement. Among some indigenous peoples, such as the Yanomani, women who engage in sexual intercourse with outsiders face little social reprobation, and as such, HIV transmission has increased [58].

As of December 2001, the PN-DST/AIDS had received reports of 52 cases of AIDS among the indigenous population over the period 1988-2001. The first case of AIDS among indigenous peoples was reported by FUNAI (National Foundation for the Indian - *Fundação Nacional do Índio*) and the MoH in 1988, in Santa Catarina State, in the southern region of Brazil. Since then, additional cases have been identified in other regions [58].

AIDS cases among the indigenous population tend to be concentrated in young adults living in the cities and mid-size municipalities of the Center-West and North: 68 percent are ages 20-34, with 65.2 percent of cases male and 79.2 percent female. As most cases reported in the Center-West involve Indians living in urban areas, particularly women, it will be important to gain a better understanding of the interactions that develop from contact with surrounding communities and risk factors such as poverty, commercial sex work, and alcoholism.

Brazil's MoH is making efforts to improve culturally appropriate medical care for indigenous peoples through the implementation of the DSEIs (*Distrito Sanitário Especial Indígena* - Special Indian Health Districts)[59]. As of 1999, FUNASA (*Fundação Nacional de Saúde*) has assumed responsibility for the health of indigenous peoples [36].

Figure 10. DSEI Distribution, 2003



Source: National Health Foundation (Fundação Nacional de Saúde)
<<http://www.funasa.gov.br/ind/dseimapa.htm>>.

FUNASA and the PN-DST/AIDS share responsibility for HIV/AIDS and STI care among indigenous Brazilians, as agreed during the National Conference on Indigenous Health in 2000. FUNASA has contracts with 28 NGOs, totaling US\$43.3 million, to implement HIV care and prevention among indigenous peoples [37, 60]. These include strategic projects with the goal of linking a network of governmental and local stakeholders and institutions to reduce the epidemic's impact on the most vulnerable and endangered groups, namely [60]:

1. Indigenous reserves that have been invaded by nonindigenous groups or are close to mining operations, including informal mining operations (*garimpos*), together with woodcutting operations, large-scale farming and livestock projects, and dam and highway construction sites
2. Indigenous communities within urban areas
3. Indigenous communities located in border areas

4. Impoverished communities

FUNASA foresees a differentiated assistance model covering all health problems affecting indigenous peoples, and has planned the following strategies with technical support from the PN-DST/AIDS and funding from the World Bank [57, 58, 60]:

- Support to intervention projects (behavioral and health), in partnership with indigenous NGOs
- Regional meetings to define prevention strategies in STIs/AIDS, monitoring indigenous health and mobility
- Training and building capacity of local villages, indigenous teachers, and local leaders as multipliers for prevention activities related to general health, emphasizing STIs/AIDS
- Sentinel surveillance to identify HIV risk factors among the most vulnerable/behaviorally high-risk indigenous population. Populations living close to border cities, traveling out of their villages toward urban areas, or engaged in sex work are considered at high risk [60].
- Translation of educational material

Economic and Political Background

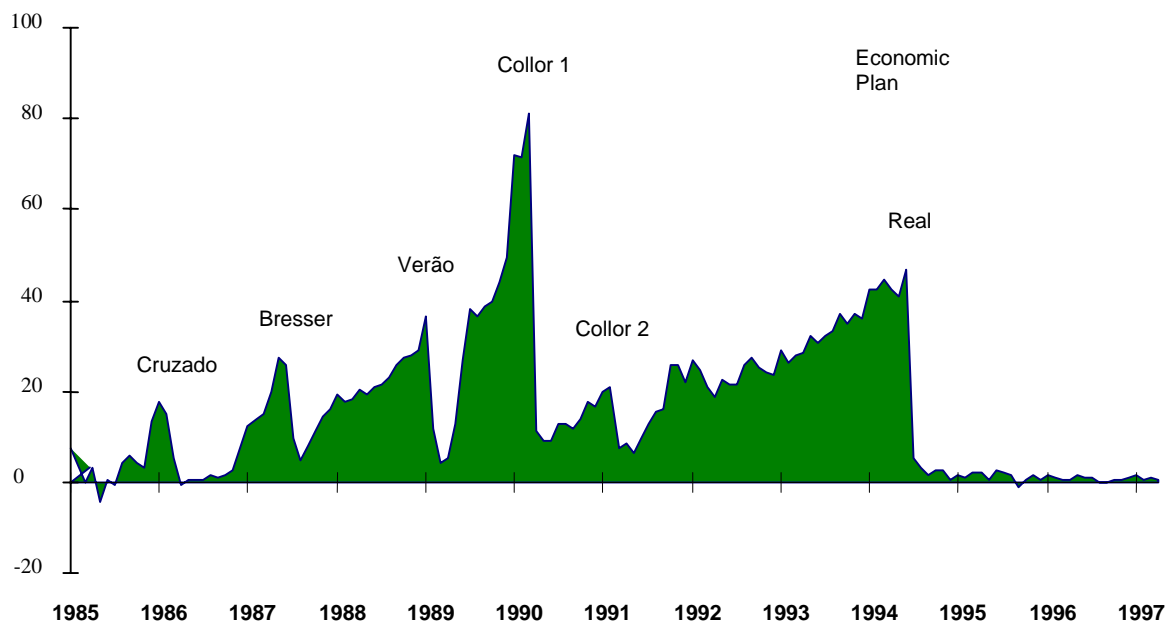
From the mid-20th century until 1985, political rule in Brazil alternated between military and civilian dictatorship. The 1960s and 1970s saw massive industrial development and economic growth, underwritten by foreign loans. Slowing growth in the 1980s brought debt crisis, rampant inflation, and a cautious return to civilian rule in 1985. By the time of the new constitution in 1988, the country faced massive inequalities in socioeconomic status, with highly inadequate spending on public health. At that time, 19 percent of the population lived in *favelas*, or urban shantytowns, and there were an estimated 12 million street children. Inflation ran at 1,100 percent; interest payments on a foreign debt of US\$115 billion consumed 30 percent of the annual export earnings. Between 1960 and 1990, the proportion of national income earned by the poorest 50 percent of the population fell from 18 to 12 percent, whereas that of the wealthiest 20 percent of the population rose from 54 to 60 percent; the richest 4 percent controlled 43 percent of the wealth.; infant mortality stood at 125 deaths/1000 live births [62].

Some socioeconomic improvement came with the adoption of the 1988 constitution, the election of Fernando Henrique Cardoso as president in 1994, and ensuing economic restructuring. The 1988 constitution [61] divides public spending equally among the federal, state, and municipal layers of government. Federal power is divided among the executive, legislative, and judicial branches. The president serves four years, with the possibility of reelection to one additional term. The legislative branch is split into an upper house, with three senators for each of the 26 states plus the federal district; and a lower house with 518 deputies drawn proportionately from the states. The constitution

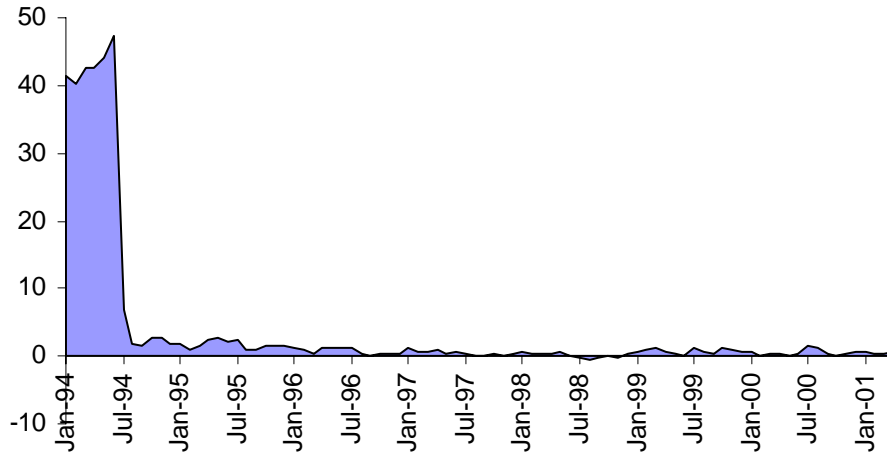
treats health as a universal right, with the state responsible for economic and social policies aimed at reducing the risk of illness and ensuring access to comprehensive care [62].

In the mid-1990s, Cardoso's administration introduced the *Real* plan, an economic stabilization program named after the new currency, that includes the introduction of a floating foreign exchange rate; privatization of state industries; opening of the economy to foreign investors; an increase in fiscal discipline at federal, state and municipal levels of government; and the correction of social inequities. There is some recent evidence for the plan's success. Inflation, which peaked at 5,000 percent in 1993, had fallen to 9 percent by 1999 [63, 64].

Figure 11. Monthly Inflation (%)

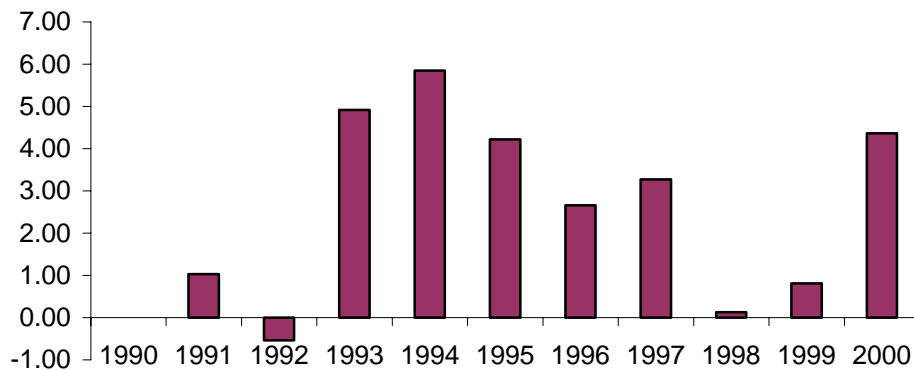


Source: Brazilian Ministry of Finance, IBGE IGP-DI mensal de Jan/85 à Abril/97 <www.ibge.com.br>.

Figure 12. Monthly Inflation, Brazil "Real" Plan, 1994-2001

Source: Brazilian Ministry of Finance

Although the *Real* Plan has controlled inflation [65], economic growth has not been as robust as expected. During the plan's initial years, annual GDP growth averaged 4 percent, but was followed by stagnation during 1998-99. During 2000-01, GDP growth was only 1.5 percent [76].

Figure 13. GDP Variance (%), 1990-2000

Source of Data: IBGE, Research branch, National Accounting Department
<http://www.ibge.gov.br/home/estatistica/economia/contasnacionais/tabela5.shtm>

During 2001, Brazil experienced several internal and external crises, including energy shortages, the worldwide recession, and regional effects of the economic collapse in neighboring Argentina [65]. In 2001, Brazil had the world's 11th-largest economy, with gross national income (terminology that has replaced GDP) at US\$528.9 billion. GNI per capita was US\$3,070, the 90th-highest GNI per capita among 208 countries. GNI per capita exceeded that for all lower-middle-income economies (which is how the World Bank classifies Brazil) (US\$1,230), though it fell below that for the Latin American and Caribbean region (US\$3,580) [76, 77].

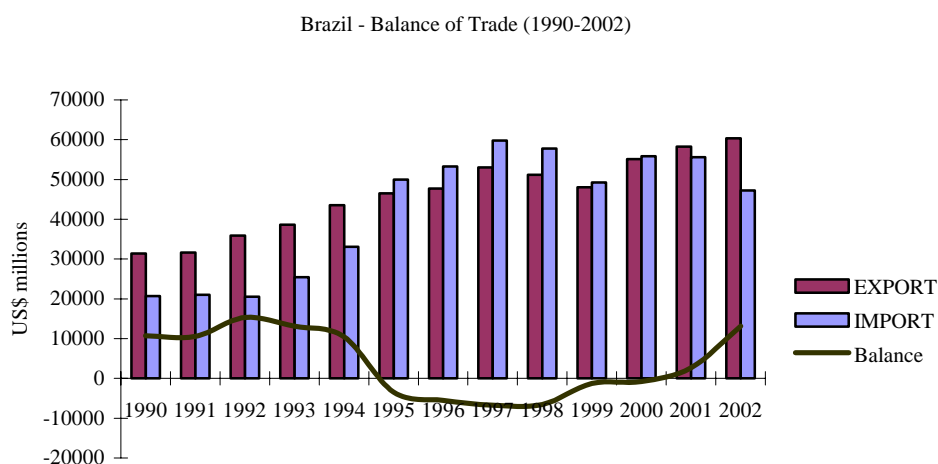
The core of Brazil's public deficit was the budget deficit incurred by the pension system. As of 2002, 3 million public sector pensioners accounted for 75 percent of the total deficit (4.2 percent of GDP) [65]. The Federal Government spent R\$33 billion to support about 1 million beneficiaries, whereas the contribution to the system averages R\$7.2 billion, generating a deficit about R\$54.4 billion [66]. In May 2000, Brazil passed the Fiscal Responsibility Law, which improved governmental fiscal discipline by lowering the ceiling on public sector pensions [66].

During 2002, the Brazilian economy was under stress because of uncertainty surrounding the upcoming presidential election [52]. Market opening and economic stabilization under the centrist Cardoso government had significantly enhanced Brazil's growth prospects. The popularity of Luiz Inácio Lula da Silva (or "Lula") of the leftist PT (*Partido dos Trabalhadores* – Workers Party) generated uncertainties internationally. Since winning office, however, Lula seems to have established credibility with both the Brazilian population and the international banking community by stressing his government's commitment to economic stability, a sustainable public budget, and reduction in the debt/GNP ratio [52].

For 2002, Brazil's GNP was US\$494.5 billion (world's 12th-largest), and GNP per capita was US\$2,830 (global ranking: 91st). GNI per capita again exceeded that for all lower-middle-income economies (US\$1,400) and fell below that for the Latin American and Caribbean regional figure (US\$3,280) (World Bank. *World Development Indicators 2004*. 2004: Washington, DC <<http://www.worldbank.org>>).

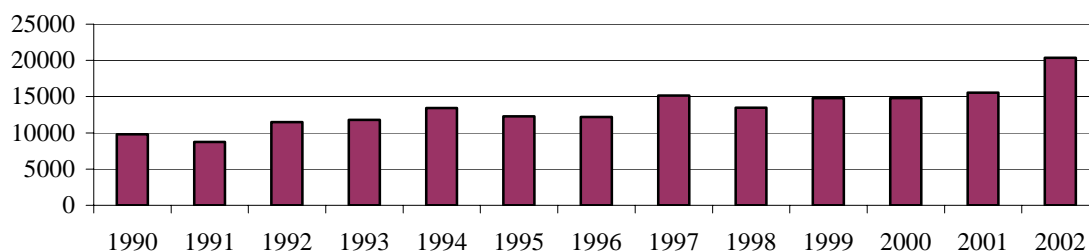
Among the tax reforms carried over from the previous government, there is a proposal to unify the ICMS (*Imposto sobre Circulação de Mercadorias*) into a standard national tax to be rated at five different levels. The main goal of this reform is to create a more effective and less complex process, by reducing the current dozens of different rates in the states, each of which administers its own tax code [65].

Brazil's import/export balance (FOB) has been shifting during the past decade (see figure 14); in 2001, the country became a net exporter.

Figure 14. Import/Export Balance

Source: MDIC/SECEX.

Agriculture accounts for 9 percent of Brazil's GDP and employs 25 percent of the labor force. The soil characteristics and wide range of temperatures allow the production of a great diversity of produce [67], including cocoa, forest products, and tropical fruits in the northeast and Amazon basin, and coffee, soybeans, sugar, rice, beef, corn, cotton, wheat, and tobacco in the southern half of the country. Brazil is self-sufficient in food [52, 67], and agriculture and food products make up 35 percent of its exports. State-of-the-art agricultural technologies are largely used in the South and Central parts of the country [52, 67]. Agribusiness, as a whole, accounts for about one-third of Brazil's GDP; in 2002, Brazil exported over US\$20 billion in agricultural products (see figure 15). Brazil is the world's largest producer of sugarcane, coffee, frozen concentrated orange juice, and tropical fruits. Livestock production also plays a major role in the Brazilian economy, and the country has the world's largest commercial cattle inventory [52].

Figure 15. Agribusiness Exports, 1990-2002 (US\$ Millions)

Source: Brazilian Ministry of Agriculture

<http://www.agricultura.gov.br/spc/balanca/evolucao_historica_balanca_anual.pdf>

The main commercial agricultural products are:

- Coffee: Brazil is the world's second largest consumer, accounting for 14.5 percent of global consumption. Brazil is also the world's largest producer of coffee beans [68].
- Beef cattle: The Brazilian cattle sector is expanding. Cattle inventory as of late 2001 included 176,388,276 heads and generated US\$3.1 billion in exports (Source: SECEX/MDIC - Secretaria de Comércio Exterior/ Ministério do Desenvolvimento, Indústria e Comércio <<http://www.mdic.gov.br/>>)
- Poultry: Brazil is the world's second-largest producer, responsible for 5.5 million tons in 2001, of which 1 million tons were exported to over 60 destinations [68].
- Soybeans and oil: Brazil is the main supplier to the European Union (US\$2.5 billion in 2000). Soy products represent the largest single share of Brazilian noncattle agricultural exports [68].
- Cotton: After a period of importation in the 1990s, Brazil is resuming its position as a major cotton exporter [68].

The rain forest covers a large portion of North Brazil. Extraction of natural resources from the rainforest has recently been outlawed by a governmental environmental plan that includes serious penalties for infractions [52].

Heavy industry represents 34 percent of GDP and is concentrated in the Southeast, particularly São Paulo State. Products include steel, commercial aircraft, chemicals, petrochemicals, footwear, machinery, automobiles and parts, consumer goods, cement, and lumber. The industrial sector has suffered the impact of the economic reforms launched in 1994, but is recovering and growing rapidly [52, 69].

Mining in Southcentral Brazil is a historically important part of the economy, and mineral resources are extensive. Large iron and manganese reserves are important sources of industrial raw materials and export earnings. Deposits of nickel, tin, chromate, bauxite, beryllium, copper, lead, tungsten, zinc, gold, and other minerals are exploited. High-quality coke-grade coal required in the steel industry is in short supply, however [52].

The services industry in Brazil covers a broad range of activities, including post, telecommunication, banking, energy, commerce and computing [52]. Banking and financial services account for 16 percent of GDP [52][70][71]. A report issued in 2003 by IBGE on the service sector in Brazil estimates that about 813,000 companies were active in the services industry as of 2001 [72]. Over 6.2 million people were employed in these areas, generating over US\$84 billion. Information (telecommunications and audiovisual) generated 31.4 percent of the revenue, but represented only 5.9 percent of the companies and 6.6 percent of total employees. Mail, transportation, and related activities generated 30.3 percent of revenues in this industry and employed 22.8 percent

of service sector employees [72]. The Brazilian telecommunications and electricity industries were privatized in 1996, bringing an increase in investment from US\$2 billion to US\$5.4 billion in telecommunications; and from US\$1.8 billion to US\$2.4 billion in electricity [52].

Brazil is a leading producer of **hydroelectric power**. Of its total electricity-generation capacity of 90,000 megawatts, hydropower accounts for 66,000 (74 percent) [52]. In 2001, a lack of adequate rainfall resulted in a major electricity crisis, with implementation of mandatory rationing and price hikes [52].

Brazil also produces most of the **oil and petroleum products** for domestic consumption, with limited dependence on imports. Petrobrás, the state petroleum company, has four divisions: Exploration and Production, Downstream, Gas and Energy, and International. Currently, it operates over 90 production platforms, more than ten refineries, and thousands of kilometers of pipelines [73, 74] (table 8).

Table 8. Petrobrás Operational Summary as of December 2002

Proven Reserves (Billions of Barrels of Oil Equivalent	10.5
Oil and Condensate (Billions of Barrels	8.9
Natural Gas (Billions of Barrels	1.6
Average Daily Production (barrels)	1,810,000
Oil and LNG	1,535,000
On-Shore	262,000
Off-Shore	1,273,000
Natural Gas (m ³)	44,000
On-Shore	19,000
Off-Shore	25,000
Pipelines (Km)	15,772
Oil and Oil-Products	7,920
Natural Gas	7,852

Source: [73, 74].

Inequalities

Despite some improvements, economic inequality in Brazil remains a serious problem. In 2000, the country's GINI index was 60.7, one of the world's highest [75]. The GINI index fell to 59.1 in 2002 (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>). (The GINI index measures the extent to which the distribution of income among individuals or households within a country deviates from a perfectly equal distribution. A value of 0 represents perfect equality, a value of 100 perfect inequality).

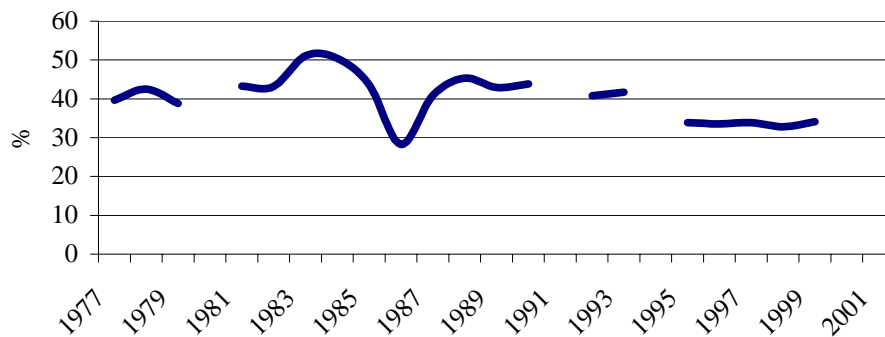
In 1998, the poorest 20 percent of Brazilians accounted for 2.0 percent of national income/consumption, whereas the richest 20 percent of the population accounted for 64.4 percent of income/consumption. The poorest 10 percent represented 0.5 percent of income/consumption, with the richest 10 percent accounting for 46.7 percent of

income/consumption (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>).

Poverty

In 2001, the World Bank estimated that 22.6 percent of Brazilians were living below the national poverty line (defined as a household per-capita income of less than Brazilian R\$65 (roughly US\$22 per month at São Paulo Metropolitan Area prices). This corresponded to 34.9 million persons [78].

Figure 16. Percent of Population Living Below the Poverty Line, 1977-2001



Note: Data based on Household Sample Yearly Analysis, IBGE (PNAD, IBGE). PNAD was not performed on 1980, 1991, 1994 and 2000.

Source: Instituto de Pesquisa Econômica Aplicada <<http://www.ipeadata.gov.br/>>.

Over a half of the poor live in small towns with a population of less than 20,000. Sixty-three percent live in the Northeast, Brazil's poorest region, where 49 percent of the population lives below the national poverty line [78].

Using international poverty markers, during 1990-2002, 8.2 percent of Brazilians lived below US\$1 a day, and 22.4 percent lived below US\$2 a day (at 1985 international prices [equivalent to US\$1.08 and US\$2.15, respectively, at 1993 international prices], adjusted for purchasing power parity) (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>).

Corruption

The most recent report on perceived corruption <<http://www.transparency.org/>> ranks Brazil in 54th place. The CPI (Corruption Perception Index) Score used by Transparency International to rate countries relates to the perception of the degree of corruption at different levels of society. It ranges from 0 (highly corrupt) to 10 (highly clean). Brazil

scores 3.9 [79]. Despite the perception that some progress has been made, Brazilians still believe that corruption is a problem [80]. In a poll conducted in 2002, 20 percent of Brazilians reported confidence in the judiciary, and 11 percent reported confidence in Congress [81].

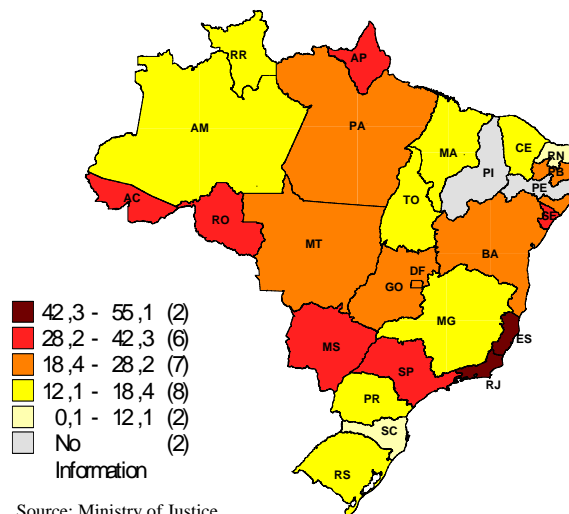
Crime and Violence

Crime in Brazil is rising. There are 30,000 homicides annually in Brazil, with the highest rate of 123 per 100,000 inhabitants in the city of Vitória, in Espírito Santo State [82].

Drug trafficking, organized crime, and violence are intertwined in Brazil, which does not produce cocaine or opium, but is often used as a transit point from neighboring cocaine-producing countries (Colombia, Peru) to the U.S. and Europe [82] (see the Response section below). Organized crime is centrally involved in drug and firearms, as well as money laundering. The fear of violence in Brazil has allowed the development of a new service industry: private security services. As of the end of 2001, such agencies employed nearly 1.5 million guards, three times the number of agents in the national police force [82].

Although rates of homicide among the overall population have risen 29 percent over the last decade, among young adults the increase has been 48 percent [83]. Death rates among the young in Brazil are 88 times higher than in France. According to police reports, over 90 percent of violent deaths/homicides affect young men [84]. The estimated cost of violence to Brazil is about R\$300 million (or US\$100 million) per day [83]. With about 3 percent of the world's population, Brazil accounts for 9 percent of global homicides [83].

Figure 17. Violent Deaths/100,000 Population, Geographic Distribution, 2002



Human Rights

Brazil is making gradual progress in addressing human rights issues such as police brutality, inhumane prison conditions, and forced labor [85]. Some steps toward human rights improvement began during the Cardoso government with the opening of police files containing information on abuses during the 1964-1985 dictatorship [85].

The *Associação Brasileira Multiprofissional de Proteção à Infância e Adolescência* – ABRAPIA (Multiprofessional Brazilian Association for Childhood and Adolescence Protection), an NGO based in Rio de Janeiro, has received 4,893 reports of child/adolescent abuse over six years of work [86]. Of 3,328 reports on child sexual exploitation, 69 percent involved prostitution, and 25 percent involved the use of children for internet pornography. The remaining 6 percent were distributed among sex tourism, production of pornographic material, and sex trafficking. Almost 1,000 children reported to ABRAPIA between January 2000 and January 2003 had been sexually assaulted by a family member [86]. NB: These are *reported* figures.

As of 1999, Brazil was one of the favorite destinations of sex tourists from the U.S. and Europe [87]. Between 1997 and 2000, ABRAPIA documented 80 cases of sex tourism involving children in Brazil; 61 percent were under age 18, and 68 percent were girls. In 1997, the U.N. compiled statistics on childhood prostitution in Brazil, although the reliability of the figures is somewhat unclear. Nevertheless, the figures presented are extremely high: at the end of the 1980s, there were an estimated 500,000 underage prostitutes in Brazil [88]. Child prostitution primarily affects impoverished states in the Northeast and Northern regions.

Human Development

Despite the significant challenges mentioned above, Brazil has made important strides in improving living conditions, as reflected in its Human Development Index (HDI), a composite overall measure of well-being. HDI scores for Brazil are increasing, from 0.644 in 1975 to 0.771 in 2000 to 0.775 in 2002 (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>).

Table 9. Human Development Index Trend, Brazil, 1975-2002

Year	HDI Index
1975	0.644
1980	0.680
1985	0.695
1990	0.714
1995	0.739
2000	0.771
2002	0.775

Source: UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>.

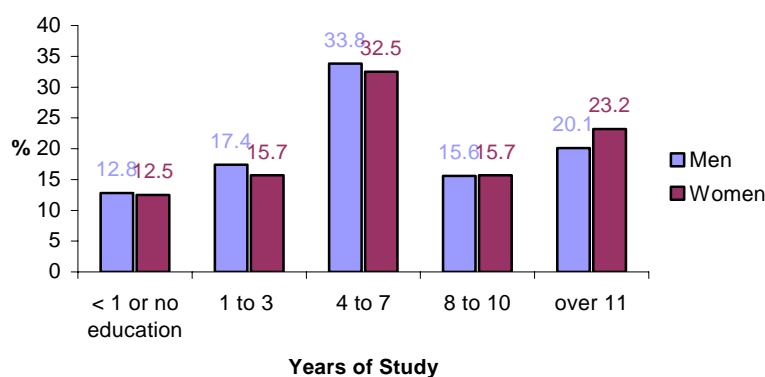
For more information on how the HDI is calculated, see UNDP. *Human Development Report 2004*. New York: 2004 <<http://www.undp.org/>>.

Education

During the 1990s, the proportion of eligible children actually enrolled in primary school increased from 86 to 97 percent. During the same period, the proportion of eligible youths enrolled in secondary school increased dramatically, from 15 to 71 percent [75]. Literacy has risen considerably during the last three decades, from 31.6% in 1970 [89], to 82.0 percent in 1990 to 87.3 percent in 2001 [75]. Brazil's 2001 adult (15 years and older) literacy rate falls somewhat below that for the LAC region (89.2 percent), though it is higher than that for all medium-level human development countries (78.1 percent). The country's 2001 youth literacy rate (95.8 percent) is fractionally higher than the LAC regional figure (95.2 percent) and higher than the figure for all medium human development countries (87.8 percent) [76].

As figure 18 below (as well as data from UNDP and UNICEF) demonstrates, male educational attainment, as measured by years of school completed, surpasses that of females through the primary level. Starting at the secondary level (8 to 10 years of study) and persisting through university, however, female educational attainment surpasses that of males [77, 90].

Figure 18. Years of Study, Persons Age 10 and Older, 2001



Source: IBGE National Census, 2001.

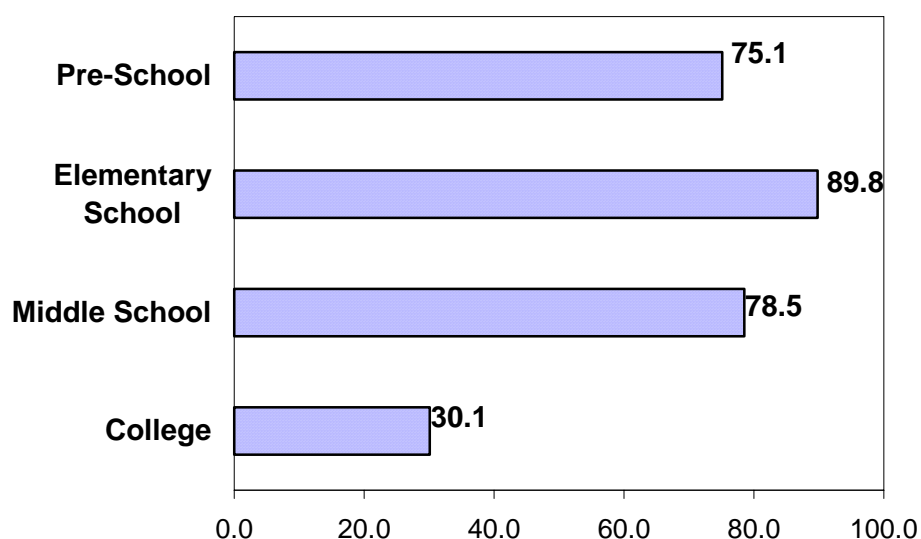
For both sexes there is a positive relationship between the number of years spent in school and wages earned. However, the higher level of educational attainment among females does not result in wage equity [91].

Table 10. Educational Attainment and Wages Earned

Years of School	Wage (% of Males at the Same Level of Education)
< 3	61.5
>11	57.1

Source: [91].

Primary and secondary education in Brazil is predominantly publicly funded. In 2001, 89.9 percent of all elementary school students and 78.5 percent of middle school students attended public schools [51]. The government spends 41 percent of its education budget on pre-primary and primary levels; 37.6 percent on secondary level; and 21.4 percent on tertiary level education [75].

Figure 19. Proportion of Students, by Education Level, Attending the Public School System

Source: [91, 92].

Health Sector

UNDP reported that in 2001, the government spent 3.2 percent of GDP on health, with private health expenditure at 4.4 percent of GDP, the latter representing 57.9 percent of all health spending (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>).

Health indicators have shown progress in the last 30 years, with increased life expectancy and decreased mortality rates. During 1970-75, life expectancy at birth was 59.5 years.

By 2001, it had risen to 67.8 years (63.7 for men and 72.3 for women) [76]. Regional differences in health outcomes persist, however, with the lowest indicators in the Northeast and the highest in the South/Southeast. For example, in 2001 the average mortality rate was 34.8, ranging from 22.8 in the South to 52.8 in the Northeast [53].

A critical indicator of the well being of children is the under-five mortality rate. In 1960, Brazil's under-five mortality rate was 177 per 1,000 live births; by 2002 it had fallen to 36. Infant mortality in Brazil fell from 115 in 1960 to 30 in 2002 (UNICEF. *State of the World's Children 2004*. 2004: New York <<http://www.unicef.org/sowc04>>).

Another critical indicator is the maternal mortality ratio (MMR), the number of deaths to women per 100,000 live births that result from conditions related to pregnancy, delivery, and related complications. In its *State of World Population 2003*, UNFPA estimated that Brazil's MMR was 277. Although below the global figure of 386, Brazil's MMR was higher than that of all other South American countries except Bolivia (360) and Peru (406) (UNFPA. *State of World Population 2003*. 2003: New York <<http://www.unfpa.org>>). Causes of maternal mortality include hypertension, hemorrhage, puerperal infection, and abortion. Some researchers also associate the high rate of maternal mortality with the country's high percentage of cesarean deliveries. Over half of births in Brazil are estimated to be delivered by cesarean section [94].

In 2000, 76 percent of the total population had sustained access to improved sanitation, and 87 percent had sustained access to an improved water source (UNDP, *Human Development Report 2004*. 2004: New York <<http://www.undp.org>>).

In 2001, diseases of the circulatory system accounted for the largest proportionate mortality, representing 32 percent of total of deaths, followed by external causes (accidents, homicides, and violence) and cancer (15 percent each), and respiratory illnesses (11 percent). Underreporting of mortality varies widely by region. Brazil's MoH currently estimates that approximately 82 percent of deaths are reported, of which 15 percent are due to an undefined cause [95], ranging from over 50 percent in the Northeast to less than 10 percent in the Southeast. The Pan-American Health Organization (PAHO) estimates that overall mortality has declined in Brazil since 1980, with the greatest decline in proportionate mortality among children under age 5 (from 24.0 to 9.8 percent), whereas the proportionate mortality of the population over age 50 increased from 48 to 62 percent. Brazil consumes 2 percent of the world's pharmaceuticals, and 1.7 percent of the world's hospital equipment and materials annually. There is a robust domestic pharmaceutical industry, with 500 companies and 47,000 employees; Brazil manufactures its own supply of BCG, tetanus toxoid, yellow fever, human and canine rabies, and DPT/pertussis vaccine. The health sector accounts for 8 percent of workforce. Nationwide, there is one physician per 757 inhabitants, and one nurse per 2,330 inhabitants. Health professionals are irregularly distributed, however with a disproportionately high concentration in industrial areas and in state capitals [96][97].

WHO estimates that Brazil has the 15th-highest incidence of TB in the world (WHO. *Global tuberculosis control: surveillance, planning, financing: WHO Report 2004*. 2004: Geneva <<http://www.who.int>>). According to Brazilian health authorities, the incidence of TB disease (as opposed to infection) is between 80,000 and 90,000 new cases each year. In 2000, 82,249 new cases were reported to health authorities [97]. Over 60 percent of these cases were pulmonary TB with positive smears, 25 percent lacked etiological confirmation, and 14.4 percent represented extrapulmonary disease [97]. Based on tuberculosis surveillance between 1994 and 1999, the incidence of multidrug-resistant TB (MDR-TB) was 1.1 percent [97]. Mortality attributable to TB fell from 6 cases/100,000 inhabitants in 1980 to 3.7/100,000 inhabitants in 1998 [97]. The Brazilian government covers over 70 percent of the treatment costs for TB, and TB control and treatment accounts for 0.3 percent of total government health expenditures [96].

The 1988 constitution guarantees every Brazilian citizen access to a comprehensive national system of health care regardless of whether the individual can afford other forms of health insurance. To realize this promise, the federal government created the SUS (*Sistema Único de Saúde*, or Unified Health System) in 1990 [98, 99]. SUS, funded by social security contributions, is responsible for universal health promotion and care, including policy formulation, epidemiology, public health promotion, and disease treatment. Seventy-five percent of the population receives its medical care through the SUS, while 20 percent has private insurance. Seventy-five percent of outpatient clinics are run by the SUS, in contrast to inpatient hospitals, 80 percent of which are privately owned (though publicly funded through SUS reimbursement). To comply with the constitutional principles of care, prevention, and health promotion, SUS is responsible for [100]:

1. Assistance: patient-centered activities, performed in clinics, hospitals and through home care.
2. Environmental interventions: public hygiene, vector and outbreak control.
3. External policies: all sectors with implications for health policy, including economic policies, working conditions, educational policies, etc.

At each level of Brazil's government—federal, state, and municipal—there are managers responsible for the three components above. Nevertheless, responsibility for patient care and health promotion falls mainly on municipalities, whereas the state level addresses disease prevention and ensures that municipalities have adequate resources to carry out their responsibilities. Municipalities are also free to trade resources among themselves. Each municipality also has its own health council, responsible for evaluating local resources and evaluating health program needs. This evaluation system facilitates the eventual reallocation of financial resources and strengthening of the regional network that provides health assistance to the local population. Health councils at each level of government, comprising representatives from government, health professionals, and consumers, also regulate SUS activities at their respective levels [99, 101]. To integrate the different levels of responsibilities—municipal, state, and federal—there are two commissions in place: *Comissao Intermanageres Tripartite*(CIT) and *Comissao*

Intermanageres Bipartite (CIB). These commissions integrate the above-mentioned levels regarding resources, responsibilities, and program implementation [100].

Hospital System

According to the Brazilian Hospital Federation (BHF), half of in-patient medical care covered by SUS is provided by private hospitals, both for-profit and non-profit [102], with reimbursement from the federal system [103].

Table 11. Overview of Hospital System

Hospital Type	Number of Hospitals	Number of Beds
Public	2,264	117,616
Private (Profit)	2,275	164,162
Private (Non Profit)	1,740	154,449

Source: [102].

SUS: The Challenges

Although SUS has taken important steps and is providing health care to millions of impoverished Brazilians, the concept of universal access to health care is an ambitious work-in-progress, and has yet to be fully realized effectively [104]. According to the independent Instituto de Defesa do Consumidor (IDEC, Institute for Consumer Protection), which studies consumer conditions, at the end of 2002, SUS was providing only 55.4 percent of the 520 medications deemed essential, such as those to treat asthma, diabetes, hypertension, and psychiatric illness [105].

In addition, reimbursements from SUS to hospitals have proven inadequate for the care delivered, provoking a fiscal crisis in Brazilian hospitals. SUS pays R\$7.50 (approximately US\$2) per patient-day. However, the hospitals cost spreadsheet compiled by BHF indicates that at minimum, cost is R\$60.00 per patient-day (approximately US\$20) [106, 107].

At the end of 2002, the newly elected federal government had plans to improve the public health care network by increasing the number of health professionals for the Family Medicine Program, increasing the manufacturing of generic versions of medications, and supporting public laboratories [108].

Gender

Overall, Brazil has made significant progress in addressing gender issues and reducing gender gaps. Recent data indicate that female presence in the labor force has been progressively increasing [91]. Nevertheless, salaries for women remained on average 70 percent that of men in 2002 [91].

Table 12. Percentage of Adult Brazilian Population Employed 1992-2001

Year	Male	Female
1992	72.4	43.4
1993	71.9	43.5
1995	71.3	44.6
1996	69	41.9
1997	69.2	42.5
1998	68.3	42
1999	67.9	43
2000	67.4	43.1
2001	67.8	44.5
Source: [91].		

Also of note is the increasing access by women to higher levels of education. Women with at least 11 years of education comprise 36.8 percent of the workforce, whereas men with same educational attainment comprise 26.4 percent [55, 91].

Domestic Violence

A 2002 review of gender issues in Brazil by the World Bank made the following observations regarding gender and violence [55]:

- Traditional gender stereotypes in Brazil, reinforced in textbooks and teaching methods, associate men with public life, politics, power, and wealth, whereas they associate women with the private, domestic sphere of the household.
- Violence against men typically takes place in the public sphere, over questions of crime and labor conflict and involves acquaintances and strangers but rarely family members. Violence against women is linked to domestic conflicts, such as conjugal difficulties, and involves relatives, acquaintances, and strangers equally.
- A study among adolescent and young adult men living in low-income neighborhoods and *favelas* revealed prevailing attitudes that:
 1. Being a man meant working hard, being responsible, providing financially, and being sexually active.
 2. Although violence against women was considered cowardly, it was acceptable if women did not, in return for their male partner's financial contribution, live up to expectations, such as taking care of children, keeping house, and remaining sexually faithful [55].

Brazil has taken several initiatives to address violence against women, including:

1. creating 200 police stations for women, staffed and directed by women (120 of these stations are located in São Paulo State)

2. training individuals on physical and sexual violence against women in sectors such as the police, the judiciary, and health
3. carrying out awareness raising campaigns through media (although television, and particularly Brazilian soap operas, or *telenovelas*, reportedly continue to glamorize violence against women
4. working to change the law to distinguish between sexual violence against a person and sexual behavior that violates customary norms, such as exhibitionism
5. creating shelters to support victims of violence and their children
6. providing psychological counseling to aggressors in an effort to prevent the repetition of violent acts [55].

Knowledge/Attitudes/Behavior regarding HIV/AIDS and Sex

See also the Response section below.

Data on knowledge, attitudes, and behavior regarding HIV/AIDS and sex come from a small number of population-based studies in addition to numerous individual studies of varying sizes and methodologies conducted in a variety of settings, rendering generalization difficult. Some results, by type of study, follow:

Population-based Studies

The public polling organization IBOPE compared findings from a 1999 population-based sample involving 1,298 sexually active individuals age 14 and above with those from a 2003 survey involving 3,600 men and women ages 15-65. IBOPE found an increase in condom use with casual partners, from 64 percent in 1999 to 76 percent in 2003 [109][110]. In the 2003 survey, 69 percent of respondents reported some sexual activity in the past six months. Men were more sexually active than women: Among men older than 14, 76.2 percent were sexually active in the past six months; among women, in the same period, 62.7 percent reported sexual activity. Among the sexually active, the average number of sexual contacts was 10.2 a month. The population ages 20-29 reported the highest levels of sexual activity. The number of sexual contacts among those who reported no condom use was 35 percent higher than the number of sexual contacts reported by those who used condoms. Overall reported use of condoms during the previous six months was 57.8 percent. Sixty-five percent of participants younger than age 19 reported condom use at first sexual contact.[110].

Military Conscripts

Annual surveys of 17- to 19-year-old male conscripts in the armed forces suggest an increase in condom use during last sexual encounter with any type of partner, from 38 percent in 1997 to 50 percent in 2000, with generally higher rates of condom use in the South and Southeast and lower rates in the North and Northeast [60].

MSM

Studying male-male sexuality in Brazil, as in much of the world, is complicated by the separation of behavior from identity: Although many men have sexual intercourse with other men, only a minority are likely to identify themselves as homosexual, gay, or bisexual, and this minority is more likely to have higher socioeconomic status and be less marginalized from HIV prevention education and services. Thus, measuring MSM's HIV/AIDS-related knowledge, attitudes, and behavior depends heavily on sampling methodology.

A number of MSM studies have been carried out, with widely divergent results. In response to concerns that the availability of antiretroviral therapy would lead to lower rates of condom use, as had been suggested by reports from Europe, North America, and Australia, PN-DST/AIDS conducted a nationwide survey of 800 MSM recruited in bars, clubs, saunas, and street events in seven large Brazilian cities in summer 2001. Among the sample, 67 percent were 18-29 years old, well-educated (51% completed secondary school and 41% some higher education), and gay-identifying men (58% identified as gay, 29% as bisexual), 91% of participants had heard of highly active antiretroviral therapy (HAART), and 86% correctly answered that HAART controlled, but didn't prevent or cure, HIV infection. Approximately 40% had a steady partner, 45% casual partners only, and 14% both. Eighty-seven percent of participants reported using a condom during their last anal intercourse with any partner, whether casual or steady; participants with casual partners only were significantly more likely to report condom use (97%) than those with steady or steady and casual partners. These rates did not vary by city, age, knowledge of HAART, reported serostatus, or perceived level of risk [111]. Results from a study of 500 MSM recruited in lower-SES areas of São Paulo reveal much higher rates of unprotected anal intercourse: 34% with steady partners and 28% with casual partners [112].

University Students

Several studies among university students in Rio de Janeiro (RJ) [113] Vitória (Espírito Santo) [114] and Maceió (Alagoas) [115], including medical students, in 1999-2000 showed uniformly high levels of knowledge about HIV/AIDS transmission and prevention, yet at the same time a persistent belief in specific risk groups, as well as high rates of unprotected sex with both casual and steady partners.

Marginalized Youth

Studies among low-income and incarcerated youth in São Paulo (SP) [116], Pires Ferreira (Ceará) [117], and João Pessoa (Paraíba) [118], show high (upwards of 90%) levels of sexual activity, early sexual initiation, and generally high levels of HIV/AIDS knowledge and awareness, particularly regarding routes of transmission and use of condoms and clean needles as prevention. Knowledge/awareness may vary widely by state: in the Northeastern city of João Pessoa in Paraíba State, 38% believed HIV could be transmitted by mosquito bites, and 18% believed HIV could be transmitted by sharing eating utensils, while in the small town of Pires Ferreira, in nearby Ceará State, levels of knowledge were quite high). Thirty four percent of participants in São Paulo reported condom use during

last intercourse; prevalence of consistent condom use was even lower, however, at 9% in São Paulo, 19% in Pires Ferreira, and 27% in João Pessoa.

CSW

Commercial sex work is not legal in Brazil. A nationwide evaluation of HIV prevention programs for female commercial sex workers (CSW) conducted by PN-DST/AIDS in the form of focus groups with CSWs participating in seven NGO-sponsored and one government-sponsored projects, [119] found high levels of knowledge and awareness, but significant barriers to implementing safe-sex practices, including fear of violence, increased payments for unsafe sex, and competition for clients. In addition, non street-based CSW reported more safe-sex practices than did street-based CSW. Informants also felt that stigmatization of their profession contributed to violence from both clients and the police.

Construction Workers

A random sample of 300 male construction workers in Praia Grande, a coastal city in São Paulo State, revealed mixed knowledge of HIV/AIDS, with reporting of both correct and incorrect (mosquitoes, casual contact) routes of HIV transmission. While almost all were aware of condoms as a prevention tool, only 67% had used condoms consistently with recent casual partners [120].

Alcohol and Drug Use

Although Brazil is not a supplier of coca leaf, the chemicals used in processing raw coca leaf into cocaine and coca paste are illegally diverted and smuggled from Brazil into Bolivia, Colombia, and Peru. Processed cocaine and paste (*merla*) are then trafficked back into Brazil for transshipment to Europe and the United States. This has resulted in a growing Brazilian market for cocaine and locally produced crack, particularly in the large cities along trafficking routes. Marijuana for local consumption is both produced locally and imported from Paraguay, and there is also a growing transshipment of heroin from Andean countries through Brazil to overseas markets. Synthesized drugs (methamphetamine, ecstasy) are smuggled into Brazil from Argentina and Europe. There is also growing abuse of legal psychopharmacological drugs (anxiolytics, opioids), particularly among youth. Drug trafficking, organized crime, poverty, and violence are closely linked in Brazil. International trafficking organizations conduct money-laundering and exchange drugs for firearms with Brazilian organized crime syndicates, making guns easily available to drug gangs, which in turn drives the high homicide rates [82].

Based on reporting of annual use and use during the most recent month, the prevalence of cannabis, cocaine, and amphetamine use in Brazil is moderate, while that of opiates and ecstasy is low. Nevertheless, the prevalence of illicit use is on the rise, particularly among youth in all socioeconomic classes. Studies of primary and secondary school students conducted by the Brazilian Information Centre on Psychotropic Substances (CEBRID) during the last 10 years show increases of 100%, 150%, 325%, and 700% in

the number of student reporting 6 or more episodes per month of using anxiolytics, amphetamines, marijuana, and cocaine, respectively [82].

The prevalence of HIV infection among injecting drug users in Brazil fell from 65% to 40% between 1994 and 2001 [19]. Although injection of cocaine has been a favored route of administration in the past, including among street children, this may be on the decline. Legal injectable psychopharmacological drugs are, however, commonly used illicitly in Brazil as they are in Argentina and Uruguay. In addition, recent studies in São Paulo State reveal a disturbing connection between the use of crack and AIDS [82].

Prevention and Treatment

Although NGOs have historically taken responsibility for the prevention and treatment of illicit substance use in Brazil, the federal government has, in recent years, recognized the links between illicit substance use and crime, poverty, and HIV infection and, with the help of the United Nations International Drug Control Program (UNDCP) undertaken 160 research projects on harm reduction, including needle exchange, among IDUs, with some impressive results, including reduced indices of needle sharing, and increased indices of clean-needle acquisition, health care access, HIV testing, and condom use among study participants vs. controls. Based in part on these studies, as well as the work of NGOs, the Ministry of Health has proposed an ambitious network of 250 community drug treatment centers (*Centros de Atencao Psicossocial –alcool drogas*, or CAPSad), integrated into the SUS, or national health care system, offering intensive, intermediate, and non-intensive levels of care, and with a goal of treating addiction and re-integrating addicted persons into society [82, 121].

Law Enforcement

Like many countries, Brazil has multiple, overlapping police forces—federal, civil, military, customs—with insufficient pooling of data and intelligence. According to the UN office of Drugs and Crime, seizures of illicit drugs, particularly cocaine, by the Federal police increased in 2002. Brazil is also attempting to control the diversion of precursor chemicals used in the processing of raw materials into street-usable drugs [82].

Impact

Civil Society

As described in the Response section below, civil society has played a major role in responding to the HIV/AIDS epidemic in Brazil, by developing a network of NGOs that receive money from the federal government to provide a wide range of prevention and care services [148]. The number of NGOs addressing HIV/AIDS grew rapidly from 120 in 1992 to more than 500 in 1998. The successful collaboration between these NGOs and the State appears to have fostered improved relations between the citizenry and the government in Brazil [149].

Demographic

Life Expectancy

The U.N. Population Division projects that AIDS will reduce Brazil's projected increase in life expectancy by 1 to 2 percent through 2050 (table 13 [150]). (NB: These projections were published in February 2003.)

Table 13. Life Expectancy at Birth due to AIDS, 2000-2005, 2010-2015, and 2045-2050

Period	2000 – 2005		2010 – 2015		2045 – 2050	
Brazil	Difference in life expectancy (years)	Percentage difference	Difference in life expectancy (years)	Percentage difference	Difference in life expectancy (years)	Percentage difference
	-1	-2	-1	-2	-1	-1

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. *World Population Prospects: The 2002 Revision. Highlights*. New York: February 2003
<<http://www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF>>

Population

The U.N. also examined population under a "no-AIDS" scenario (tables 14 and 15). By 2050, the U.N. projects that Brazil's population will be 2 percent smaller than it would have been without AIDS. Factors include AIDS deaths, as well as reduction in fertility due to condom use to prevent infection, fewer births because of a smaller reproductive age population, and fertility reduction associated with HIV infection [150]. (NB: These projections were published in February 2003.)

Table 14. Projected Population with and without AIDS: 2000, 2015, 2050

2000	2015	2050
------	------	------

With AIDS	Without AIDS	With AIDS	Without AIDS	With AIDS	Without AIDS
171,796,000	172,261,000	201,970,000	203,831,000	233,140,000	236,895,000
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. <i>World Population Prospects: The 2002 Revision. Highlights</i> . New York: February 2003 < http://www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF >					

Table 15: Projected Population Reductions: 2000, 2015 , 2050					
2000		2015		2050	
Population Reduction	Percentage Reduction	Population Reduction	Percentage Reduction	Population Reduction	Percentage Reduction
464,000	0	1,861,000	1	3,755,000	2
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. <i>World Population Prospects: The 2002 Revision. Highlights</i> . New York: February 2003 < http://www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF >					

Mortality

See also the UNAIDS Estimates section above.

The U.N. estimates that there were 480,000 AIDS-related deaths in Brazil between 1980 and 2000. The U.N. projects 1.24 million AIDS-related deaths during 2000-15, and 1.26 million during 2015-50 (see tables 16 and 17) [150]. (NB: These projections were published in February 2003.)

Table 16. Projected Number of Deaths with and without AIDS, 1980-2050					
1980-2000		2000-2015		2015-2050	
With AIDS	Without AIDS	With AIDS	Without AIDS	With AIDS	Without AIDS
22,346,000	21,907,000	20,140,000	18,900,000	68,564,000	67,338,000
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. <i>World Population Prospects: The 2002 Revision. Highlights</i> . New York: February 2003 < http://www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF >					

Table 17. Excess Deaths Because of AIDS, 1980-2050					
1980-2000		2000-2015		2015-2050	
Excess Deaths	Percentage Increase	Excess Deaths	Percentage Increase	Excess Deaths	Percentage Increase
438,000	2	1,240,000	7	1,225,000	2
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. <i>World Population Prospects: The 2002 Revision. Highlights</i> . New York: February 2003 < http://www.un.org/esa/population/publications/wpp2002/wpp2002annextables.PDF >					

National Welfare System

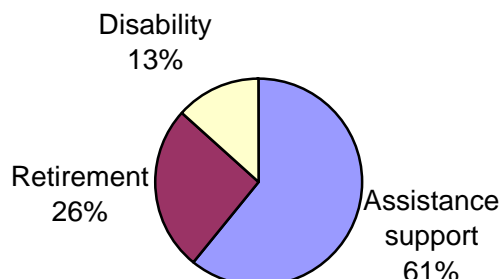
It is estimated that some 40 million Brazilians are working and therefore have some means of providing for their own financial support. The national welfare system in Brazil provides financial support for beneficiaries who contribute to the system and are, for any reason, permanently or temporarily unable to work [151]. Benefits are paid to the contributor/beneficiary or his/her dependents in the event of disease, death or disability [152]. Continuous benefits are characterized by monthly payments until some other event, such as resolution of disability or death, promotes its discontinuation. *Retirement benefits* are paid to any beneficiary who is considered permanently unable to work due to disability or old age [152]. Retirement funds awarded for *disability* can be terminated if the beneficiary starts any paid activity.

Since 1993, *temporary assistance support* to the disabled has also been granted [152]. This benefit has a fixed value of one wage and is granted for a limited amount of time to anyone who proves he/she is unable to support himself/herself and also lacks economic support from his/her family. A family is considered unable to provide support to the beneficiary when its income is lower than one-quarter of current per capita wage.

Data from the welfare databank from 1996-2001 show that a total of 37,402 subjects were enrolled in the system due to HIV/AIDS [153], totaling 43,574 benefits granted (some patients were granted more than one benefit). Fifty-five percent were concentrated in the Southeast, the region with the highest AIDS caseload. Approximately 20,000 of these persons continue to receive benefits. Sao Paulo accounts for 41% of the benefits granted, reflecting the largest prevalence of HIV/AIDS in that state.

Figure 20. Active Benefits Granted to AIDS Patients by the Welfare System, by Type of Benefit, 1996-2001

Total = 37,402 AIDS patients



Source: INSS/DATPREV 2001.

Over the years, changes in the type of benefits granted reflect the changing profile of the epidemic. As mentioned above, the majority of benefits are granted to the southeastern region. The age of the beneficiaries matches the age range of reported AIDS cases (between 33 and 42 years of age). Also of note is the rising number of benefits requested for and granted to children younger than 12 years of age, reflecting the cost of caring for children infected vertically before the introduction of PMTCT, as well the needs of uninfected children of infected mothers [153].

Between 1996, when ARVs became widely available, and 2001, the proportion of requests to the welfare system for *retirement benefits* decreased [153], while the proportion of requests for *temporary assistance support* (currently 61%) has increased, suggesting a shift in the epidemic from a debilitating to a chronic, manageable disease. Also of note is the increase in requests for benefits on the basis of poverty [151, 154], reflecting the pauperization, or movement into lower socio-economic classes, of the epidemic [153].

Health System

In 1994, the World Bank estimated that by 2002 Brazil would report nearly 1.2 million cases of HIV infection. Instead, estimates indicated approximately 500,000 cases at the end of 2000 [5, 18, 155], less than 50 percent of what was estimated in 1994. By December 2001, over 120,000 AIDS patients were cared for under the PN-DST/AIDS [155]. AIDS-attributable mortality was reduced between 60 and 80 percent as was the incidence of opportunistic infections (OI) [5], a situation reflected in the reduction in AIDS-attributable hospital admissions. It is estimated that 358,000 admissions were avoided between 1997 and 2001, saving the country US\$1 billion. During the past decade, national treatment program is thought to have prevented nearly 60,000 new AIDS

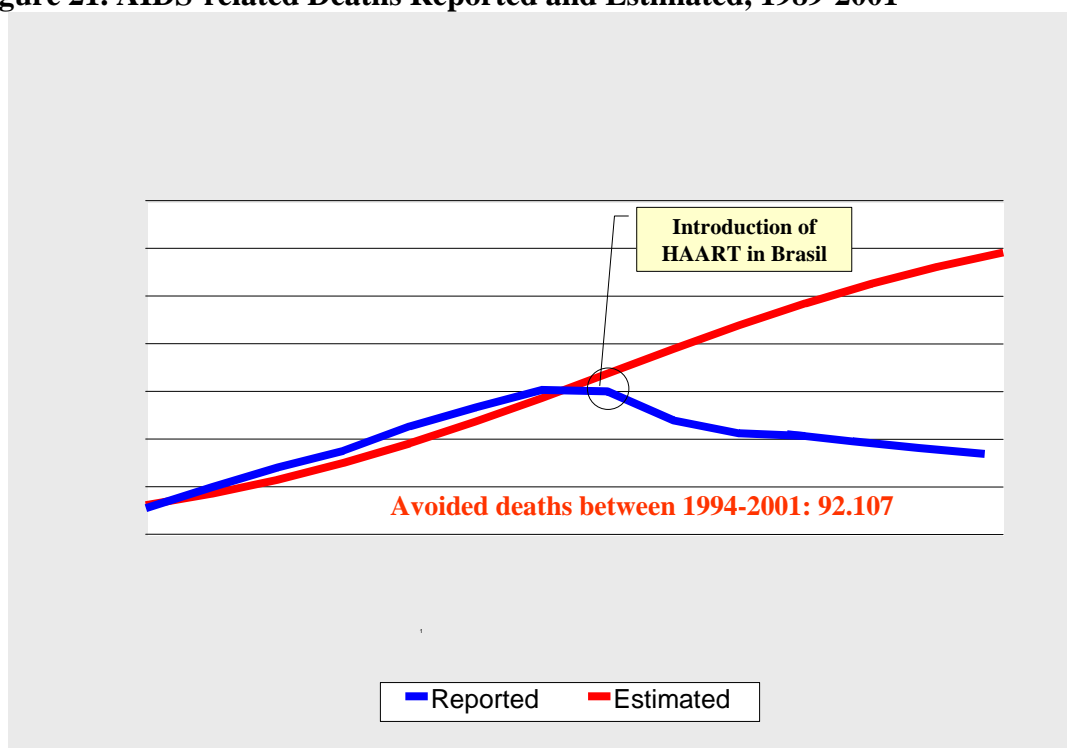
cases, for an estimated savings of over US\$1.2 billion in ambulatory care. The introduction of prophylactic therapy for Prevention of Mother-to-Child Transmission (PMTCT) has prevented an estimated 3,700 pediatric cases [60, 156].

Table 18. AIDS Hospital Admissions in Public Health System, Post-HAART Era, 1996-2001

	1996	1997	1998	1999	2000	2001
Hospital Admissions	25,458	25,157	24,700	25,027	26,655	25,274
AIDS patients	15,390	35,900	55,600	73,000	87,500	105,150
Hospitalisations/Aids (Mean)	1,65	0,70	0,44	0,34	0,31	0,24

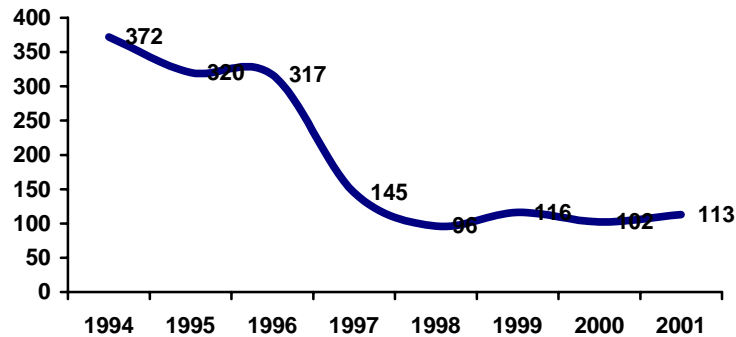
Source: Brazilian Ministry of Health, 2002.

Figure 21. AIDS-related Deaths Reported and Estimated, 1989-2001



A striking example of the reduction in morbidity since the introduction of widespread ARV availability is the drop of 65% in tuberculosis cases associated with HIV infection. Santoro-Lopes et al., studying the risk reduction for tuberculosis among AIDS patients with advanced disease (% CD4+ lymphocyte < 15) has shown that the use of HAART was associated with an 80% reduction in the risk of developing clinical tuberculosis [157]. (Also see WHO 2004 profile of TB in Brazil: <http://www.who.int/tb/publications/global_report/2004/en/Brazil.pdf>).

Figure 22. Tuberculosis in HIV Patients Seen at a Reference Center in São Paulo, 1994-2001



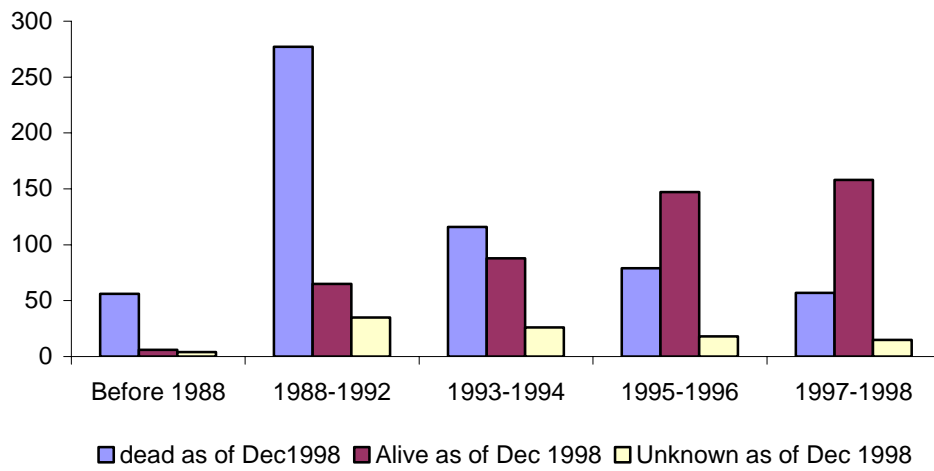
Source: Brazilian Epidemiology-Reference and Training Center for AIDS and STD, May 2002.

Orphans and Other Vulnerable Children

Children on the Brink 2002, a report on AIDS orphans undertaken by UNAIDS, UNICEF, and USAID, estimated that the percent of Brazil's orphans that could be attributed to AIDS rose from 0.4 percent in 1990 to 2.4 percent in 1995 to 4.9 percent in 2001. This percentage was projected to rise to 6.7 percent in 2005 and to 8.9 percent by 2010 [40].

In a retrospective cohort study, Matida and Marcopito analyzed the survival of 1,147 HIV-infected children under 13 years of age as of December 2001. The study covered different phases of the epidemic, different diagnostic definitions, and different treatment options regarding antiretroviral therapy and prophylaxis and treatment of opportunistic infections and the sample was based on the official database of AIDS cases, SINAN-AIDS. 79.7 percent of the cases resulted from vertical transmission, 16.4 percent from infected blood products, and 3.9 percent from unknown risk factors. The majority of the cases had been diagnosed between 1988 and 1992 (32.9 percent). As of December 1998, 585 (51 percent) had died, 464 (40 percent) were alive, and 98 (9 percent) were of unknown status. Given that 84.9 percent of children diagnosed with HIV infection before 1998 had died, the study suggested a decreased mortality rate during the period that corresponded to the introduction of effective ARV therapy and clinical monitoring in Brazil [158].

Figure 23. Number of Deaths among 1,147 HIV-Positive Children by Year of Diagnosis, 1988-1998



Source: Brazilian Ministry of Health, PN DST/AIDS [158].

Response

Government (Ministry of Health)

Brazil's response to the HIV/AIDS epidemic emerged in the mid-1980s in the context of a decade of political transition and economic turbulence, when Brazil experienced democratization, the gradual reconstruction of civil society, and the formulation of a new social agenda for issues such as education and health (see discussion of SUS above). It was at just this time that Brazilian newspapers began describing a 'new disease' and the first AIDS cases were reported in the country [122]. At the state level, in 1983 the first governmental AIDS program was set up in São Paulo State.

Early responses to the epidemic came from NGOs advocating for the rights of populations initially affected by the epidemic, particularly gay men. In 1985, the Brazilian MoH established the National AIDS/STD Co-ordination Program (PN-DST/AIDS), and since 1986 AIDS has been a reportable disease in the country. Medicines for opportunistic infections began to be distributed in the public health system in 1988, and AZT also began to be offered in 1991. The program expanded its activities in the 1990s and increased its partnership with non-governmental and community-based organizations in civil society. This was stimulated by the first US\$160 million loan from the World Bank (AIDS-I), administered from 1994 to 1998. AIDS-I helped to establish a durable approach to the HIV epidemic in Brazil by piloting and implementing programs to prevent HIV transmission and treat opportunistic infections among the HIV-infected. It also helped to create a broad-based effort to address the epidemic, involving federal, state, municipal and non-governmental community-based organizations. Programs included public and NGO-based condom distribution, a network of VCT (voluntary counseling and testing) centers, strengthening the safety of the blood supply, behavioral interventions targeting high-risk groups, and community support programs. Money also went towards increased disease surveillance, and establishing a network of national reference labs. Money for clinical care was limited to provision of AZT to pregnant women, and providing antimicrobial drugs for bacterial STDs and opportunistic infections [60].

AIDS-II, a second World Bank loan of US\$165 million (1998-2002) augmented traditional, proven prevention services, such as increasing availability of condoms and doubling the number of VCT sites in four years, but also helped to build an infrastructure for care and treatment of HIV-infected persons, by providing funds for training of clinical staff, strengthening laboratory services for clinical monitoring, measuring drug adherence and resistance. Antiretroviral drugs themselves were not provided for in the loan. Again, AIDS-II encouraged the participation of multiple layers of society—federal, state, and municipal governments, as well as NGOs—in the provision of HIV prevention and care services [60].

Today the general principles of the Brazilian national AIDS program are to [123]:

- Guarantee the human rights of people living with HIV/AIDS
- Guarantee the free access of the entire population to HIV prevention and care, including the diagnosis of HIV infection, the treatment of opportunistic infections, and laboratory monitoring and antiretroviral medications necessary for the treatment of HIV infection itself

While a challenge, the Brazilian PN-DST/AIDS sees prevention and treatment as a continuum, and tries to link these two fields in its policies. Key targets have been identified, such as preventing infection; promoting HIV testing; promoting proper condom use; providing disposable syringes; and increasing the availability of, and provision of incentives for, pre-natal testing, and prevention of other STDs [18]. Specific incidence and prevalence goals for the year 2006 include [60]:

- Reducing prevalence of HIV among:
 - men 17-19 years of age.
 - women age 15-26 to 0.6%.
 - IDU from 36.5% (2003) to 20%.
 - CSW aged 20-24 from 6.1% (2002) to 4.5%.
 - MSM aged 20-24 from 14% (2002) to 10%.
- Reducing prevalence of syphilis among:
 - men age 17-19 from 1.3% (2003) to 1.0%.
 - women aged 15-49 from 1.7% (200) to 1.0%.
 - IDU to 0.4%.
 - CSW from 3.8% (2002) to 3.0%.
 - MSM from 7.7% (2002) to 4.0%.

The specific role of the federal government (in the form of the MoH, through the PN-DST/AIDS) includes drafting policy and legislation regarding prevention and treatment of HIV/AIDS; the collection of surveillance, utilization, and clinical data for epidemiologic and planning purposes (which includes the establishment and maintenance of SICLOM and SISCEL information systems—see below); the allocation of funds to states and municipalities, and the ongoing effort to develop and encourage prevention and treatment services run by states, municipalities, and NGOs themselves. The involvement of local government and NGOs is supported by the presence of representatives from civil society, health care providers and the private sector in the decision making body of the Ministry of Health, known as the National Health Council, or CNS [60].

One of the most widely publicized, and indeed central, roles of the PN-DST/AIDS is the legally guaranteed provision of state-of-the-art highly active antiretroviral therapy (HAART) and laboratory monitoring through the public health system to all Brazilians who meet clinical criteria for treatment (all HIV-infected patients whose CD4 cell count is below 200/mm³; asymptomatic patients with a CD4 cell count between 200 and 350/mm³) [124]. The Brazilian government has made this possible by encouraging the domestic manufacture of generic, bioequivalent versions of antiretroviral drugs (ARVs).

Currently, Brazil produces 7 of the 18 commercially available ARVs, accounting for approximately 50% of such drugs used in the country. This has also allowed the MoH to negotiate lower prices on proprietary medications purchased from international pharmaceutical companies. Nevertheless, federal spending on AIDS increased from US\$330 million in 1997 to US\$553 million in 1999; spending on ARVs accounts for the majority of this increase. Current goals of the federal government's AIDS program include the continued roll-out of the treatment program (see below), continued reduction in the costs of drug and supply acquisition, continued access to treatment of opportunistic infections, and continued decentralization of the program through involvement of state and local governments and civil society, as well as an improvement in monitoring and evaluation of the program's accomplishments and shortcomings. This exists alongside efforts to improve the funding of the national health care system (SUS) in general. Specific disease reduction goals of the PN-DST/AIDS by the year 2006 include [60]:

- Reducing AIDS mortality from 6.3% (2000) to 6.0%
- Reducing AIDS incidence from 14.2 per 100,000 (2000) to 10.0 per 100,000.
- Increasing survival of adult PWA from 58 months (1996) to 72 months.

Specific Federal Goals and Programs

Public Visibility and Social Marketing

PN-DST/AIDS, in cooperation with advertising firms, funds and produces social marketing campaigns promoting condom use, support of PLWHA, and HIV awareness in diverse media, including television, print journalism, and public spaces such as billboards and bus shelters (see, for example:

<http://www.aids.gov.br/final/prevencao/prevencao1.htm> and <http://www.aids.gov.br>)

Condoms

Regarding condom promotion, PN-DST/AIDS estimates that approximately 1.2 billion condoms per year will be needed to cover the needs of the Brazilian population. Right now, Brazil consumes about 600 million condoms a year, of which the Government distributes 250 million free of charge, and 350 million are sold through ordinary commercial channels [125]. Also, the NGOs provide free and low cost condoms [125]. PN-DST/AIDS is currently developing a number of different strategies to guarantee the sustainability of its activities and increase the spread of condom use. These include: the manufacture and distribution of generic condoms; the reduction of taxes on condoms; and agreements to be drawn up with manufacturing companies, distributors and retailers in order to reduce the profit margins on condom sales [125].

As part of its application for a third loan from the World Bank (AIDS-III), the PN-DST aims to increase condom availability and use. There are two principal goals to be achieved by the year 2006. The first involves increasing the prevalence of condom use during last intercourse with a non-regular partner by (a) commercial sex workers, from 68 percent (2003) to 75 percent ; (b) the entire sexually active population >14 yrs of age,

from 76 percent (2003); (c) youth 14-24 years of age, from 64 percent (2003), to 80 percent; (d) conscripts age 17-19, from 50 percent (2000) to 70 percent; MSM, from 92 percent (2003) to 95 percent (2006). The second involves increasing condom sales to at least 550 million [60]. Besides the male condom, the Brazilian NAP also distributes female condoms. In 2002, the authorities acquired 4 million units and the distribution is aimed at women's health programs, drug users or partners of drug users, sex workers and HIV positive women.

VCT

There is both a deficit of testing facilities and difficulty in obtaining results, as it can take up to one month for tests to be processed, leading approximately 25 percent of testers not to return for results. To combat the gap in HIV testing (approximately 30 percent of the estimated total number of HIV-infected persons in Brazil are thought to know of their infection), the federal government aims to increase testing through the public health system. Both the number of tests done through the public system and the number of VCT centers almost doubled, from 2.3 million test annually in 1997 to 4.4 million tests annually in 2002, and from 104 to 231 centers. The percentage of the population that has been tested has grown as well, from 20 percent of 16-65 year olds in 1999, to 30 percent in 2003. Interestingly, the percentage of the general population tested who were women increased from 15 percent of 16-65 year olds in 1999 to 34 percent of 26-40 year olds in 2003, suggesting that vertical transmission prevention programs were working. Federal law protects the confidentiality of HIV test results (see the discussion of civil rights below). Year 2006 PN-DST/AIDS goals for VCT, as noted by the World Bank, include increasing the prevalence of HIV testing among sexually active persons >14 years old to 50 percent, increasing the proportion of VCT sites receiving at least 50 percent of test results within one week to 65 percent, and increasing the mean CD4 cell count HIV diagnosis from 387 cells/mm³ (2003) to 425 cells/mm³, i.e. increasing early diagnosis of HIV infection [60].

PMTCT

PN-DST/AIDS estimates that of the 8,398 AIDS cases in persons under 13 years of age as of March, 2002, 86 percent were due to vertical transmission. Included in the guaranteed provision of ARVs, care, and monitoring through the public health system is the recommendation that pregnant WLWHA (women living with HIV/AIDS) receive CD4 and viral load monitoring, with ARV therapy for the mother and, subsequently the newborn, based on the protocol described in PACTG076, the study which showed that AZT reduced vertical transmission. Per PN-DST/AIDS recommendations, pregnant HIV+ women already on combination ARV therapy, or whose CD4 and viral load measurements during pregnancy indicate the need for combination ARV therapy, should receive additional therapy in line with PACTG 076. In addition, cesarean delivery is recommended for mothers whose viral load exceeds 1000 c/mL [126]. In 2001, approximately 40 percent of delivering women were tested for HIV, with 32 percent of positives receiving ARVs. ARV coverage of pregnant women was better in the Southeast (49 percent), and worse in the Northeast (7 percent). By 2006, PN-DST/AIDS aims to

increase the proportion of pregnant WLWHA receiving ARV to 95 percent, and to reduce the HIV incidence related to vertical transmission from 16 percent (1998) to 8 percent [60].

Care

Brazil provides five types of care for people living with HIV and AIDS (PLWHA) through specialized units administered by states, municipalities, and, in some cases, the Ministry of Health [18]:

- Outpatient Services: 383 units
- Day Hospitals: 82 units
- Home Therapeutic Care Services: 66 units
- Conventional Hospitals: 383 units
- STD Care Services: 1,126 units

In line with the drive to reduce costs of the national treatment and care program, PN-DST/AIDS has expanded the number of ambulatory treatment facilities five-fold, and day-hospitals twofold, since 1998. Omitting STD care services, this yields 916 HIV/AIDS care facilities nationwide, with roughly even geographic facility/case ratio, except in the North, which has a disproportionately high number of facilities (see table 19 below). Of concern, however, is the South, which has the country's highest incidence of new AIDS cases, and will therefore face an increased need for care services.

Table 19: Allocation of AIDS/HIV Care Facilities by Region and Disease Burden

Geographic Region	# HIV/AIDS Facilities (% of country total)	Care (% of country total)	Cumulative # AIDS cases 1980-2002 (% of country total)	Facilities per 1000 cases	Year 2000 AIDS Incidence/100py
North	31 (3)		4340 (1.8)	7.2	3.8
Northeast	99 (11)		22,249 (9.4)	4.5	5
Central	55 (6)		11998 (5)	4.6	9.8
West					
Southeast	558 (61)		159,965 (67)	3.5	16.9
South	173 (19)		39,028 (16)	4.4	18.7
Brazil	916 (100)		237,580 (100)	3.9	12.4

Source: World Bank [60].

Treatment of OIs

State-of-the-art guidelines for treating opportunistic infections are published on the PN-DST/AIDS website (see <http://www.aids.gov.br/final/tratamento/tratamento.htm>); as in the case of ARV therapy, the cost of OI treatment is born by the public health system; although ARVs are provided by the federal level of government (through the PN-DST/AIDS), the responsibility for providing medications to treat OIs and STDs is

divided between states and municipalities per agreements negotiated in each state [60, 127].

Combination/Highly Active Antiretroviral Therapy (HAART)

In 1996, the government formulated a policy to distribute ARVs for PLWHA through the public health system, and in November of that year, President of the Republic Fernando Henrique Cardoso signed law 9313, establishing the free distribution of medicines to PLWHA through the public health system [128]. The passing of this law reflected in part the efforts of community groups which had filed lawsuits, beginning in 1988, against state and local governments to guarantee assistance to people with AIDS and treatment with medication for AIDS-related opportunistic infections [129].

The high cost of purchasing ARVs is a key factor that could threaten the feasibility of the national response to the epidemic; in 2001, the Brazilian government spent US\$232 million on ARVs to treat more than 100,000 AIDS patients [125]. Alongside free distribution, the ability of the Brazilian government to reduce the procurement costs of ARVs has been crucial to the success of the national HIV program. This has been made possible by the local production, by public health labs such as FIOCRUZ, in Rio de Janeiro, of seven of the ARVs currently available in Brazil. For drugs that are not manufactured locally, Brazil has sought to negotiate the best possible prices with international drug companies, using the ability to break patents and produce drugs domestically as leverage to overcome resistance [130]. Despite such threats, there has been no compulsory licensing of AIDS drugs in Brazil. As of 2003, 17 individual antiretrovirals (plus coformulated AZT and 3TC) were available in Brazil, including nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), and protease inhibitors (PIs). Delavirdine and zalcitabine, while available, are no longer recommended for use by the PN-DST/AIDS [127]. Since 1996, when the national treatment program began, and 2003, the number of HIV-positive persons treated with highly active antiretroviral therapy (HAART) rose from 20,000 to 125,000. Between 1997 and 2001 the average annual per-patient cost of HAART fell 54 percent, from US\$4,860 to US\$2,223 [60, 125].

Table 20: Antiretrovirals Available in Brazil

NRTIs	NNRTIs	PIs
Zidovudine	Nevirapine	Indinavir
Lamivudine	Efavirenz	Saquinavir
Didanosine	Delavirdine	Ritonavir
Stavudine		Nelfinavir
Abacavir		Amprenavir
Zidovudine/Lamivudine		Lopinavir/ritonavir
(co-formulated)		
Tenofovir		Atazanavir
Zalcitabine		

Note: Drugs in **bold** are produced domestically.

Source: Brazilian Ministry of Health, PN-DST/AIDS <<http://www.aids.gov.br>>.

The effect of local ARV production on costs incurred by the Brazilian Government can be seen by comparing the costs of ARVs offered by proprietary manufacturers vs. those paid by the PN-DST/AIDS. Zidovudine (ZDV), which is also manufactured by Brazilian labs, is offered by the proprietary manufacturer at US\$.078-1.00 per 100mg tablet; PN-DST/AIDS pays US\$0.132 per 100mg tablet. The combined formulation of zidovudine and lamivudine (ZDV/3TC), also manufactured by a Brazilian lab, is offered by the proprietary manufacturer at US\$0.063-2.95 per tablet; PN-DST/AIDS pays US\$0.564 per tablet. For efavirenz, a drug not produced in Brazil, PN-DST/AIDS has negotiated a price of US\$0.846 per 200mg tablet vs. the proprietary manufacturer's price of US\$0.430-2.00 [131].

Beyond its financial aspects, the ARV distribution program involves logistic and strategic considerations that, in a country with the size of Brazil, cannot be overstated. Also important is the capacity of the country to train personnel in the diagnosis and treatment of HIV/AIDS, to strengthen public clinical laboratories, and to establish criteria for the administration of ARVs. To address this last question, independent advisory committees have aided the Brazilian PN-DST/AIDS in elaborating and regularly updating recommendations and guidelines for treating adults and adolescents, including pregnant women, and children [123, 132]. These guidelines include criteria for initiating, monitoring, and changing antiretroviral agents, as well as specific drugs and drug combinations that should be used to maximize potency, tolerability, and durability of antiretroviral therapy, and minimize toxicities and the likelihood of drug-resistance. These guidelines are updated at least annually and disseminated on the PN-DST/AIDS website (see <http://www.aids.gov.br>) [124].

Part of the logistical challenge has been to develop a strategy to both distribute and monitor ARV through the public health system. Key aspects of this strategy included defining locations where persons can receive medicines, creating a system to track the distribution and correct usage of medications, and establishing a network of laboratories for clinical monitoring (CD4 count and HIV viral load). By 2003, there were 474 sites around the country where patients receive ARV through the national program. These sites, called AIDS Drugs Dispensing Units (ADDU) are located in public hospitals or health centers. To be eligible to receive treatment, the patient must be enrolled at the ADDU and be under the care of a physician from the SUS [60, 130].

Between 1997-1998 the PN-DST/AIDS began to implement a system, known as the Computerized System for the Control of Drug Logistics (*Sistema de Controle Logístico de Medicamentos, SICLOM*), that registers the distribution of ARVs, helping both to maintain needed stocks of the drugs at the ADDUs and to ensure that ARVs are prescribed in accordance with national treatment and prescribing guidelines to maximize efficacy and minimize toxicity [133].

Since the appropriate application of ARV therapy depends on critical patient data, the Brazilian MoH established, in 1997, a network of public laboratories where patients could receive CD4 and viral load tests free of charge [134]. In 2001, 78 laboratories around the country were equipped to perform CD4/CD8 testing, and 66 laboratories were equipped to perform viral load testing [135]. Eventually, the government aims to have 133 such facilities nationwide. Another computer system, called System for Control of Laboratory Exams (*Sistema de Controle de Exames Laboratoriais*, SISCEL), established in 1997, gathers data from these public labs and sends the information, online, to the PN-DST/AIDS in Brasília. A system to perform ARV resistance genotyping is also being introduced, with 14 labs as of 2002; to contain costs, genotyping services are available only for patients failing an ARV regimen, rather than before starting their first regimen [60].

Budgets

The Brazilian National AIDS Program is conducting an initiative called *Brasil: Contas Nacionais* (Brazil: National Accounts). The objective is to consolidate the national expenditures related to HIV/AIDS at the federal, state, and municipal levels. It will also take into account expenditures by the private sector (including families and private enterprise), donors and other governmental sectors. Data published for 1998 indicated that of the AIDS budget of US\$436 million, the federal government spent roughly US\$352 million (81 percent) for treatment; US\$42 million (10 percent) for prevention; US\$41 million (9 percent) for institutional development; and US \$1 million (0.2 percent) for surveillance [136]. In 2000, treatment represented 80 percent of program costs. ARVs alone represented 69 percent of total costs. Currently (2003) Brazil spends the equivalent of 3.25 percent of its GDP on public health, or roughly US\$17 billion annually, of which US\$437 million, or 2.6 percent is spent on HIV/AIDS, essentially the same as in 1998 [84].

Human Rights/ Stigma/ Discrimination

Brazil is unique in linking its official response to the HIV epidemic to questions of human rights, a linkage that arose out of the political and social context into which HIV emerged. The first cases of AIDS in Brazil were identified in the early 1980s, when the nation was just emerging from a long-standing military dictatorship. Secondly, the question of health became politicized in Brazil in the 1980s, with important initiatives, such as the *Movimento da Reforma Sanitária* (Movement for Sanitary Reform) — led by health professionals and private organizations, among others — which fought for changes in the public health system. The third factor was the participation of individuals and experienced activists who had fought the military regime, including former political exiles — such as Herbert de Souza, known as *Betinho*, and Herbert Eustáquio de Carvalho, known as *Herbert Daniel* — in the fight against the HIV/AIDS epidemic. Some of these people were active in both governmental and non-governmental organizations [129]. For example, in 1986 Betinho founded, in Rio de Janeiro, the Brazilian Interdisciplinary AIDS Association (ABIA, *Associação Brasileira Interdisciplinar de AIDS*) and, also in Rio de Janeiro, in 1989, Daniel created the first

group Pela VIDDA (For the Valorization, Integration and Dignity of People with AIDS, *Pela Valorização Integração e Dignidade do Doente de AIDS*). Both individuals have already passed away due to complications related to AIDS: Daniel in March of 1992, and Betinho in August of 1997. (For information about ABIA see <http://www.abiaids.org.br>. For information about Pela VIDDA see <http://www.pelavidda.org.br>.)

Today, in Brazil, access to treatment has progressed from being regarded as a legal right to being recognized as an inalienable human right, by both NGOs government at all levels, and is playing an increasingly prominent role in developments related to the HIV/AIDS pandemic [129]. Under Brazilian law it is illegal to discriminate against PLWHA in matters of employment, health care, or access to public facilities such as preschools, schools, institutions of higher education, and cultural or athletic facilities. It is illegal for medical personnel to violate the confidentiality of PLWHA regarding history or exam information, or test results. There are also provisions in Brazilian law to prevent the firing of PLWHA due to prolonged absences from work. The PN-DST/AIDS, in cooperation with NGOs, has set up a network of legal assistance clinics for PLWHA who may have suffered discrimination [137].

As in many aspects of health care and human rights in Brazil, the extent to which these policies are respected varies widely by population subgroup and geography. During recent consultations with The World Bank, Brazilian NGOs and CBOs noted ongoing discrimination against PLWHA in the North, including insufficient legal assistance and discrimination by security forces and health care workers [84]. A large survey of women living with HIV/AIDS in São Paulo state in 2001 also noted lack of respect for patient confidentiality [138].

Nonhealth Ministries

The Ministries of Education (HIV/STD prevention in public schools), Justice (prevention and punishment of discrimination against PLWHA), and Social Assistance (disability and welfare insurance for PLWHA) are the non-health ministries most actively involved in combating the HIV epidemic in Brazil [60].

Challenges to/Gaps in the Governmental Response to HIV/AIDS

Despite the accomplishments of the CD-DST/AIDS in HIV prevention and treatment, a number of challenges remain if Brazil is going to continue to maintain control over its HIV/AIDS epidemic. These have been identified by the most recent (June 2003) evaluation by the World Bank, as well as scholars and journalists, and are summarized below (except where otherwise noted, these observations and recommendations come from the 2003 evaluation of the Brazilian National AIDS Program, carried out in preparation for the third World Bank loan installment [60].

- The need for an objective system of measurement and evaluation, with standardized methodologies and performance indicators at the national, state, municipal and community levels, to assess the effectiveness of prevention and care interventions over time.

- Although PN-DST/AIDS uses some of the most cost-effective prevention interventions—peer education among high-risk groups, condom promotion, VCT, PMTCT, blood safety—and its behavioral prevention interventions have shown remarkable success—exemplified by the rise in VCT sites and condom availability—demand for services far outstrips supply. “Although demand for testing has increased since 1999, only 30 percent of the population aged 15-49 in 2003 has ever been tested. Comparable figures for the U.S. placed the population ever tested at 42 percent in 1996 (CDC). An estimated 600,000 Brazilians are living with HIV/AIDS, out of which 200,000 are receiving some form of treatment (including 125,000 receiving ART), suggesting there is considerable room for improvement in both testing and treatment. As is the case with HIV test results, delays in viral load and CD4 test results need to be reduced. It is estimated that 34 percent of those testing positive during childbirth have received treatment. Data on coverage of testing of pregnant women is currently not available. STD prevention and control is also deficient primarily because supplies are often lacking. STD diagnosis and treatment continues to be weak because states, which are responsible for the provision of medications for treatment of STDs, have not made available the necessary supplies” [60].
- The availability of treatment and prevention programs needs to follow socioeconomic trends in the Brazilian HIV epidemic, particularly the rapid growth in economically disadvantaged urban and rural groups. The pauperization of HIV/AIDS in Brazil may uncover new challenges in fighting the disease. Some journalistic reports allude to the rise in AIDS-related mortality in Rio de Janeiro and São Paulo, attributing this to the increase in HIV infections among the poorest parts of the population, and suggesting that poverty might interfere with adherence to medications [139]. Other reports point in the same direction, indicating, for example, that more than half of the 40,000 people taking antiretrovirals in the State of São Paulo in 2001 were unemployed [140]. Data released by the MoH also raise questions about the relationship between socioeconomic status and adherence to medications [141]. Other challenges include the generally lower access to health care among this population, which leads to presentation to care with more advanced disease, and lower rates of literacy.
- The growth of the epidemic in women needs to be addressed in more innovative ways: “Current prevention strategies do not adequately address the needs of most women in Brazil nor elsewhere. Current interventions need to be diversified and need to address the specific situation of each subgroup of women as they each face different risks. Most prevention interventions directed to women emphasize primarily condom use and treatment of STDs, which are insufficient to protect most women, who happen to be poor and thus have little leverage in negotiating the use of condoms in sexual encounters. While some effort has been made to provide women with negotiations skills, the effectiveness of these interventions needs to be assessed. A study conducted in São Paulo found that half of all new

- AIDS cases among women were women with a single partner [142], suggesting that specific groups of women need to be targeted with messages addressing their situation. Moreover, where relevant, they should be approached with their partner for greater effectiveness. It should be noted that part of the increase in the numbers of women infected relative to men may be due to the fact that women are more likely to come into contact with the health system.” [60].
- Rising costs of antiretroviral therapy, whether due to increased numbers of people needing treatment, new and expensive medications coming to market, complex regimens to treat patients with resistant virus, or challenges of providing ARV to marginalized populations, may threaten the sustainability of the program. “However, given universal access to ARV, rising costs stem from the provision of ART rather than from increased morbidity and mortality, and issues regarding the development of resistance to existing drug regimens (even though current evidence notes that resistance is lower than levels observed in Europe and the U.S.) and the appearance of new HIV clades become more central. In addition, its cultural and geographic diversity, existing disparities in health financing and service utilization, the ambiguous roles of states and municipalities and fragmentation that has resulted from the process of decentralization of the sector, all pose important hurdles that need to be addressed to combat the epidemic.” [60].
 - The central administrative core of the PN-DST-AIDS, currently numbering some 200 people, is paid for by the World Bank loan and must find a way to sustain itself.
 - While access to prevention and care services needs to be increased, the quality of such services needs to be improved and standardized throughout the country. Currently, amidst decentralization of oversight from the federal level to the states, there is inadequate oversight of training and performance. There is a “need to strengthen weaker NGOs to ensure improved access. The quality of prevention “services” within the health network must also be strengthened, as sometimes health service professionals are insufficiently informed and continue to have discriminatory attitudes towards patients. Access to timely test results is important to ensure individuals return for their results. Delays in obtaining HIV test results are significant, with more than half of confirmatory tests taking between 4-6 weeks, and need to be reduced. As many as one-quarter of all people tested do not return for test results due to delays. The quality of treatment and care also need to be improved to ensure greater utilization. A study conducted in São Paulo noted some variability in the quality of care provided to HIV/AIDS patients in public facilities. The same study found adherence to treatment improved with better quality of care. Adherence to treatment is equivalent to that observed in other countries. A national study of quality of services in specialized ambulatory AIDS facilities, day hospitals, VCT centers, conventional hospitals and home care services is currently being conducted to address this issue. Strengthened supervision of program implementation is necessary at municipal and state levels” [60].

- Involvement of non-health sectors of the government, particularly the education ministry, in prevention efforts has to be made long-term rather than sporadic, so that early HIV awareness and prevention becomes an integral and permanent part of, for example, the educational system.

Civil Society

Civil society took an early lead in responding to the AIDS epidemic in Brazil. Beginning in 1983, especially in Rio de Janeiro and São Paulo, informational campaigns were started with the support of gay groups [143, 144]. In the early 1980s, AIDS was referred to in the Brazilian media as “the gay plague” and “gay cancer,” among other terms. Unlike the situation in the U.S. and Western Europe, Brazil had never distinguished between CBOs (Community Based Organizations), and the ASOs (AIDS Service Organizations). With regard to the Brazilian non-governmental responses to the epidemic, the term “NGO” has always been used to embrace many different types of non-official responses to the epidemic.

The first NGO dedicated specifically to AIDS, *Grupo de Apoio à Prevenção à AIDS* (Support Group for AIDS Prevention, GAPA), was founded in São Paulo in 1985. Since then, groups of people with HIV/AIDS, gays, lesbians, transvestites, feminists, religious organizations and sex workers all have been especially important in offering initiatives. Today, it is impossible to know the exact number of NGOs addressing HIV/AIDS in Brazil. According to the PN-DST/AIDS, between 1988 and 2000, a total of 1681 projects were financed involving 686 civil society organizations [136], though many other organizations work without such a link.

The participation of NGOs and civil society in confronting the HIV/AIDS epidemic in Brazil has, in broad terms, followed a trajectory. The 1980s were marked by confrontation with the public sector, whose responses were deemed inadequate. For example, one of the first important struggles carried out by the NGOs — especially by the Brazilian Interdisciplinary AIDS Association (ABIA) — was the promotion of blood safety, a tremendous problem at that time. Regulation of blood donation, in both private and public venues, was entirely inadequate; paid donation was allowed, and in order to increase profits some blood banks didn’t screen all blood that was collected. As a result, the blood supply carried an elevated risk of infection with Hepatitis viruses, Chagas’ disease and HIV. After the approval of the Brazilian Constitution, in 1988, paid donation was outlawed. In the late 1980s and early 1990s diverse sectors around the country became mobilized; and in the 1990’s, civil society and government began to work more in partnership as part of the national response to the HIV/AIDS epidemic [144]. Certain states such as Rio de Janeiro, São Paulo, Santa Catarina, Minas Gerais, Goiânia, Rio Grande do Sul, Bahia and Pará have established forums of AIDS NGOs, and Brazilian NGOs participate in governmental forums such as the National Health Council, and the National AIDS Commission, as well as parallel State and Municipal entities.

Role of the Roman Catholic Church

Brazil has the largest Roman Catholic population of any country in the world. The role of the Catholic Church in Brazilian HIV prevention programs is complicated. Although the official church condemns the promotion of condom use, which is central to the PN-DST/AIDS prevention policy, numerous individual priests have advocated condom use as appropriate HIV prevention, often with Governmental backing, including the use of federal funds to produce informational material. Official Church condemnations of such efforts have been repudiated by the federal government, which largely sees the Church as a potential partner in HIV/AIDS care and prevention [145, 146].

External Donors

A number of international institutions are active in HIV/AIDS programming in Brazil such as USAID, UNESCO, UNICEF and UNDCP. The UNAIDS Theme Group, created in Brazil in 1997, plays an important role in the coordination of the activities of the international agencies in the country. The Theme Group includes UNFPA UNDP, UNICEF, UNESCO, UNDCP, USAID, ILO, WHO/PAHO, FAO, UNIFEM, GTZ, DFID, WB, and representatives of civil society, the private sector and the PN-DST/AIDS [125]. Brazil has not applied for funds from the Global Fund for AIDS, Tuberculosis and Malaria.

The World Bank (WB) is the multilateral institution that provides the greatest funding to Brazil. The WB AIDS I project (1994-1998) totaled US\$250 million, made up of a US\$160 million component from the bank and a national contribution of US\$90 million. The second loan (1998 to 2003) was for US\$300 million, consisting of US\$165 million from the bank and US\$135 million from Brazil. Together, both loans funded the development of prevention services, epidemiological surveillance, and capacity building [147]. In December 2003, Brazil received a third loan from the World Bank (AIDS-III), consisting of US\$200 million for 2003-2006, with US\$166.1 million for improving the quality of prevention, treatment, and care services, US\$9.54 million for scientific and technical development, and US\$24.37 million for strengthening program management [60].

Academic and Research Institutes

Universities and research institutions (see below) have partnered with PN-DST/AIDS in training staff (FHI), doing epidemiological research (University of California San Francisco, University of Pittsburgh, Johns Hopkins), testing (CDC), prevention interventions (FHI), measurement and evaluation (UCSF, CDC, HRSA, NASTAD, FHI) and vaccine development (ANRS, IAVI) to name a few areas. This research has provided a large amount of knowledge to back up the formulation of effective strategies to fight the HIV/AIDS epidemic [125]. A partial list of international institutions working on HIV prevention and research in Brazil includes:

- Agence Nationale de Recherches sur le Sida (ANRS, France)

- Family Health International (FHI: <http://www.fhi.org/en/HIVAIDS/CountryPages/Brazil+HIV-AIDS+country+page.htm>)
- U.S. Centers for Disease Control and Prevention (CDC: <http://www.cdc.gov/nchstp/od/gap/countries/brazil.htm>)
- International AIDS Vaccine Initiative (IAVI)
- Johns Hopkins Medical Institutions (U.S.)
- U.S. National Institutes of Health (NIH)
- The Population Council
- University of California Los Angeles (UCLA)
- University of California San Francisco (UCSF)
- University of Pittsburgh (U.S.)

Industry

According to the World Bank, the private sector finances and implements prevention initiatives in the workplace for a total of 4.0 million workers [60]. In the mid-1980s, non-governmental organizations began to take a central role in the establishment of a response to AIDS in the private sector. Organizations such as ABIA (*A Associação Brasileira interdisciplinar de AIDS*, The Brazilian Interdisciplinary AIDS Association), and GAPA (*O Grupo de Apoio à Prevenção da AIDS*, and the Support Group for AIDS Prevention, (GAPA) in São Paulo were pioneers in developing educational seminars and written information on HIV prevention to be conducted and distributed in the workplace. In 1988, for example, ABIA launched a prevention campaign aimed at construction workers and, from 1990-1994 implemented the project “Solidarity is a Big Company,” which conducted prevention programs in numerous national firms, such as Vale do Rio Doce, Xerox, Petrobras, and Banco do Estado do Rio de Janeiro. While companies provide prevention education, it remains the role of the government to pay for treatment. In 1998, the MoH created the National Enterprise Council of Corporations on HIV/AIDS (for more information, see <http://www.aids.gov.br/cen/index.html>). Approximately 24 large companies belong to the Council, including Volkswagen and MTV-Brasil. Through the Council, companies develop initiatives to spread information about HIV/AIDS and its prevention among workers and their families, extending these efforts throughout the community. Some programs, such as those developed by Volkswagen, have educational activities such as regular lectures for employees, information in the company journal, production of educational pamphlets, and the installation of condom dispensers inside of factories. The company also offers a variety of support services to HIV-positive employees (for more information, see http://www.aids.gov.br/cen/cases_volks.html).

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