Chapter 29

AIDS in Brazil: The Challenge and the Response

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Introduction

The HIV/AIDS epidemic commenced in Brazil, the fifth largest country in the world, in the early 1980s during a time of profound social and political change. As the military dictatorship, which had taken power in 1964, gradually lost support, a political process known as *abertura*, "opening", began. During the late 1970 s, there was a gradual recovery of political rights and by the early 1980s Brazil held its first post-dictatorship democratic elections. During this time, new political and community leaders, as well as non-government organizations (NGOs), lobbied for public health, social security and medical care reforms. In 1988, Brazil adopted a new Constitution which guaranteed universal and equitable provision of health care to all Brazilians. As HIV/AIDS became a growing public health problem, both the social will and a public framework to fight the epidemic were developing; advocacy by the public health sector and by social activists played a fundamental role in shaping the nation's early response to the epidemic.

In the mid 1980s/early 1990s, people living with HIV/AIDS (PLWHA) sued local and federal governments for failing to uphold the constitutional right to health in the context of HIV/AIDS. They first sued for the right to treatment of opportunistic infections, and later for antiretroviral drugs (ARVs) such as Zidovudine (AZT). These court cases and social mobilization paved the way for a 1996 Law, Law 9.313, which established free and universal access to ARVs. A tremendous amount of social mobilization by civil society groups held the government accountable for its commitments to providing health services to treat PLWHA and clearly stood in contrast to other illnesses. Brazil's early inclusion of highly active antiretroviral therapy (HAART) in the Brazilian HIV/AIDS program played a major role in its success in combating the AIDS epidemic over the years, and has distinguished Brazil from most other developing countries that did not offer treatment to PLWHA until much later.

However, major achievements in terms of comprehensive management and care of PLWHA took place in a context of deep social inequality. Brazil has one of the world's most inequitable wealth distributions (BMoH – IDB, 2005). In 2005, 46.9% of the national income was controlled by the wealthiest 10% of the population, while only 0.7 % was controlled by the poorest 10% (UNDP, 2005). As a consequence, Brazil's Human Development Index (HDI) ranking is relatively low given its per capita Gross Domestic Product. Indeed, almost a quarter of Brazilians earn less than USD 2 a day (UNAIDS, 2006) (See Table 29.1).

Wealth, health and income disparities also vary widely by geographic region as do degrees of urbanization, economic development (Szwarcwald et al., 2002), and access to health care infrastructure (Almeida et al., 2000). Socioeconomic disparities, geographic diversity, and the size of the country have all complicated the Brazilian response to HIV/AIDS. While universal access to HAART was quickly implemented in major metropolitan areas with well-functioning health systems, drug logistics and patient monitoring systems remain fragmentary in more remote Brazil, where health infrastructure development requires significant time and financial investment (Bastos et al., 2001).

Despite these challenges, the history of the Brazilian HIV/AIDS epidemic has been characterized by collaboration between the Brazilian Ministry of Health (BMoH), NGOs, and international organizations. While dispensing and

Table 29.1 Basic indicators, Brazil.

Indicators	Values
Population (2004)	181 586 000
Gross Domestic Product per capita (2003)	8694 PPP US$
Birth Rate (2003)	18.3 per 1000 inhabitants
Total Fertility Rate (2003)	2.1
Mortality Rate (2003)	6.1 per 1000 inhabitants
Life Expectancy at Birth (2004)	Women 72 years Men 68 years
Infant Mortality Rate (2003)	24.1 per 1000 live births
Maternal Mortality Rate (2003)	73 per 1000 live births
Adult Literacy Rate (2004)	89%
Urban Population (2004)	83%

Source: IDB 2005. Indicadores e Dados Básicos para a Saúde. RIPSA.

monitoring treatment remains the responsibility of public health care providers and is financed by the federal government (Galvao, 2002), NGOs and local governments play a key role in the full implementation of initiatives aiming to prevent new infections among vulnerable populations, especially among hard-to-reach/mobile populations, such as injecting drug users (IDUs) and long-distance truck drivers (Fonseca et al., 2002; Malta et al., 2006). Partnerships between the federal government and the World Bank have also financed prevention efforts (The World Bank, 1998a, b).

Brazil's size, geopolitical and economic importance, and the uniqueness and relative success of its HIV/AIDS program may offer important insights to other nations struggling to curb the epidemic. This chapter addresses key aspects of Brazil's response to the HIV/AIDS epidemic, beginning with an overview of the major trends in the epidemic. Essential aspects of prevention, and management and care are also explored. Relationships between federal and local governmental initiatives and civil society, challenges of monitoring and evaluating public policy response to the epidemic and efforts to finance a comprehensive response are all reviewed. Finally, components of Brazil's response are considered in the context of national monitoring initiatives as well as global responses to the HIV/AIDS epidemic.

The HIV/AIDS Epidemic in Brazil: Main Epidemiological Findings

Major Epidemiological Trends: HIV/AIDS Cases

The first cases of AIDS in Brazil were reported in the early 1980s. They were initially concentrated in the large metropolitan regions of the South and Southeast, principally along the Rio/Sao Paulo corridor, primarily among relatively affluent men who had sex with men (MSM) and recipients of contaminated blood products (Barcellos & Bastos, 1996). Since the onset of the HIV/AIDS epidemic in Brazil, AIDS prevalence and incidence have varied widely across

subpopulations and geographic regions. These varied trends have often been referred to as "sub-epidemics" in Brazil.

The epidemic subsequently spread to injecting drug users (IDUs), their sexual partners, and MSM living in urban areas throughout Brazil (Lowndes et al., 2000). This second phase of expansion of the HIV/AIDS epidemic took place in the late 1980s and early 1990s. After 1993, the epidemic was characterized by a rapid increase in heterosexual transmission of HIV. During this phase of expansion, the epidemic which had previously been largely confined to urban areas spread to all of Brazil's geographic regions, resulting in increasing numbers of HIV infections among women. There has been a progressive "feminization" of the epidemic; the male to female ratio has evolved from 5.9:1 in 1989 to 1.4:1, today (BMoH, 2006a). With an increase in the number of cases in women, the number of infants infected through vertical transmission also grew substantially (Szwarcwald et al., 2000a; Brito et al., 2005).

Statistics from the BMoH collected over time, reveal these trends. Between 1980 and 1985, among accumulated HIV/AIDS cases in 15 to 49 year olds: MSM represented 76% of all cases; IDUs represented 13% of all cases; and men represented 96% of all cases. In 1994, the proportion of accumulated cases attributed to MSM had fallen to 38%, while cases attributed to IDUs grew to 28%, and men represented 82% of all cases. By 2001, MSM accounted for 27% of all accumulated cases, male IDUs accounted for 21% of accumulated cases, and women represented 29% of all cases. The remaining cases include those with an unknown exposure category (∼10% over time) and a residual category of people who received blood transfusions/blood products/transplants (∼0.5%, over time) (BMoH, 2006a).

Despite these trends, IDUs and MSM are still at higher risk for contracting HIV and have a higher incidence of HIV than the heterosexual population (Fonseca & Bastos, 2007). Very high prevalence rates of HIV (over 45%) have been found among southern IDUs (Caiaffa et al., 2003). Sex workers also remain at risk with moderately high HIV prevalence rates (7%) (Trevisol & Silva, 2005). HIV/AIDS in Brazil is also increasingly affecting poor residents of smaller municipalities. The proportion of newly diagnosed AIDS cases among unemployed and unskilled workers, and among individuals with no more than a primary school education has grown over the last two decades (Fonseca et al., 2000; Fonseca et al., 2002; Fonseca et al., 2003).

Mother-to-child transmission accounts for approximately 3% of all HIV/AIDS cases in Brazil. Although a decrease in HIV/AIDS cases reported in infants has been noted since 1997, such data may not be accurate due to significant delays in reporting pediatric cases. In 2000, HIV reporting among pregnant women became mandatory. Since then, 31,921 new HIV infections among pregnant women have been reported (BMoH, 2006a), corresponding to an overall prevalence of 0.41% (95%CI 0.29%–0.53%) among Brazilian pregnant women (Szwarcwald & Souza Júnior, 2006). One of the main problems currently faced by Brazilian health authorities is the less than optimal use of prenatal services among women of low socioeconomic status. Many women do not attend prenatal care regularly and those that use public prenatal services are seldom counseled and tested for HIV (Souza Junior et al., 2004).

The HIV/AIDS epidemic in Brazil is also characterized by geographic and regional differences. While the epidemic is still concentrated in large, urban

centers, the percentage of HIV/AIDS cases in urban areas has been declining over time. In the 1990s, cities with 500,000 inhabitants showed the lowest growth rates, with a tendency towards stabilization, while smaller cities showed a much faster rate of growth (Szwarcwald et al., 2000a). In the Southeast, where the epidemic is older and more mature, HIV/AIDS rates have largely stabilized (BMoH, 2006a) while the South has the largest HIV/AIDS incidence and one that continues to increase (Hacker et al., 2006).

People Living with HIV/AIDS and AIDS Deaths

As of June 2006, a total of 433,067 HIV/AIDS cases had been reported to the BMoH (2006a). Many people are unaware of their status, however, and estimates suggest that there were approximately 600,000 people living with HIV/AIDS (PLWHA) between the ages of 15 and 49 years in Brazil at the end of 2000 (Szwarcwald & Castilho, 2000), and that despite regular updates these estimates remain unchanged (e.g. Szwarcwald & Carvalho, 2001; Szwarcwald & Souza Junior, 2006). While HIV prevalence in Brazil is moderate in comparison to most developing countries, Brazil's population of over 180 million explains the country's high number of PLWHA (UNAIDS, 2006).

Between 1980 and 2005, a total of 183,074 AIDS deaths were reported to the BMoH. In 1996, the year HAART was introduced, AIDS death rates per 100,000 inhabitants were 9.6, decreasing to 6.0 in 2005. The decline in AIDS related mortality per 100,000 inhabitants has been especially pronounced in the Southeast (16.3 in 1996 versus 8.0 in 2004). Mortality has declined less in the South (8.9 in 2004), where AIDS incidence has risen among IDUs (Hacker et al., 2006). Overall, AIDS-related mortality decline has been more pronounced among men than women (BMoH, 2006a).

The first study to document the survival of adult patients living with AIDS in Brazil, published in 1992, summarized data from a national sample (Chequer et al., 1992) and found a much shorter median survival time for patients in Brazil (5.1 months after AIDS diagnosis) than was seen in developed countries at that time. Substantial increases in survival were seen, however, in the late 1990s and the present decade. Median survival time was much longer for patients diagnosed in 1996 (58 months), who started their antiretroviral (ARV) therapy with HAART, instead of mono/dual ARV therapy (Marins et al., 2003).

The Challenge of Equity

The impact of the HIV treatment and prevention programs has been tangible throughout Brazil, and among different social strata and regions (Hacker et al., 2004; Brito et al., 2005). However, inequitable distribution of treatment and prevention benefits remains a problem in Brazil. Geographic disparities in the number and accessibility of HAART dispensing units persist; the urban Southeast (72 million people) has over 320 ARV dispensing units, while the vast Brazilian North (13 million people) is served by just 29 units (BMoH, 2006b). In spite of the much higher HIV prevalence in Southeastern Brazil, the paucity of clinics in Northern Brazil may impede access to treatment in the most rural parts of the country. Counseling, testing, and other preventive services are also concentrated in the South and Southeast regions of Brazil. Surveillance data for

some hard-to-reach populations, including sex workers and migrant laborers, remain sparse.

Prevention

Prevention in Context

Although a predominantly Catholic country, under the strong influence of conservative forces, solidly represented in the Congress and other political fora, Brazil's initiatives to curb the HIV/AIDS epidemic have been progressive. Both mass media and targeted education and propaganda campaigns have been launched by the BMoH as part of its HIV prevention program. Mass media campaigns using radio, television, and newspapers have focused on raising awareness about risk factors for HIV transmission, including drug use and unprotected sex, decreasing stigma and fostering support for PLWHA. Sexual topics have been discussed openly in Brazilian schools and Brazilian mass media campaigns have been among the most explicit of any governmental information campaigns in the world. Surveys conducted by the BMoH suggest that HIV/AIDS knowledge and awareness in Brazil are quite high (Fonseca & Bastos, 2007).

Initiatives targeting at-risk populations, such as pregnant women from underserved communities, youth, IDUs, MSM, and sex workers have also been promoted by both the government and NGOs. Publicly-sponsored prevention campaigns have also focused on combating stigma among MSM, sex workers, and other vulnerable populations. Although such campaigns have been seldom evaluated, it is generally assumed that they have contributed to observed decreases in HIV prevalence among these sub-populations. The Brazilian government and NGOs are also actively involved in sexually transmitted infection (STI) and HIV/AIDS programs targeting sex workers, MSM, IDUs, and adolescents.

Among the general population, a key aspect of STI and HIV/AIDS prevention, together with mass media campaigns, is the broad distribution of condoms. Indeed, despite an ongoing, sometimes acrid debate about the promotion of condoms, between the Roman Catholic Church and activists, and within the Catholic church between traditional priests who condemn both sex outside of marriage and condom use and liberal priests who have committed to condom promotion, the government has distributed millions of condoms every year. Condom sales increased dramatically during the 1990s; 53 million condoms were sold in Brazil in 1992, 70 million in 1993, and 350 million in 2000 (Levi & Vitoria, 2002).

Prevention Success Story: HIV/AIDS Among IDUs in Brazil

Latin America produces 95% of all globally available cocaine. Brazil shares borders with the world's main coca producers, including Peru, Bolivia and Colombia. Moreover, major cocaine trafficking routes cross Brazil. While a proportion of cocaine shipments from Brazil go either directly or, increasingly, via Africa to Europe (UNODC, 2006), a share of shipments are consumed in Brazil. Since cocaine users inject more frequently than opiate users, cocaine use

raises individual and population HIV risk (Davis et al., 2006). Among adults (≥14 years old), 9.8% of male AIDS cases reported to the BMoH as of the end of 2006 were among IDUs. IDU is less prevalent among women; only 4.7% of all female AIDS cases reported in the same period were attributable to IDU (BMoH, 2006a).

Previous studies carried out by a research group at FIOCRUZ (Oswaldo Cruz Foundation) show that Brazil, due to its size and strong social and cultural heterogeneity, harbors many different HIV/AIDS sub-epidemics, with pronounced differences within its IDU population (Bastos et al., 2005; Hacker et al., 2006). To date, IDUs have had a negligible role in the HIV/AIDS epidemic in the less industrialized areas in northeastern Brazil, with the exception of the state of Bahia (Andrade et al., 1998; Dourado et al., 2006), the southernmost state of this region. However, IDUs have played a central role in the HIV/AIDS sub-epidemic in the industrialized southeast, especially in the state of São Paulo, and, more recently, along the southern coast from São Paulo to Brazil's southernmost border (Hacker et al., 2006).

The IDU-associated HIV/AIDS epidemic in Brazil initially followed the main cocaine shipment routes, from the western border to main ports located in the southeast (Barcellos & Bastos, 1996; Bastos et al., 2002). This phenomenon is similar to the clustering of HIV/AIDS among IDUs along heroin routes in Asia (Beyrer et al., 2000). As shown by previous studies (Kalichman, 1993; Fonseca & Castilho, 1997), IDUs are concentrated in the richest socioeconomic regions of Brazil, but the vast majority of them belong to the poorer and less educated strata of Brazilian society.

Cocaine trafficking, cocaine consumption and the spread of HIV and other blood-borne infections became the hallmark of the Brazilian southern coastal sub-epidemics in the late 1990s, with explosive IDU-related HIV epidemics in some municipalities located along the coast of the states of Santa Catarina and Rio Grande do Sul (Hacker et al., 2006). In some municipalities in this coastal strip, over 50% of all reported HIV/AIDS cases have been among IDUs. This helps explain the fast and sustained spread of HIV in the south among women (many of them partners of IDUs) and their offspring. This also explains the less significant decline in AIDS-related deaths compared to other Brazilian regions (Bastos, 2002).

In order to quickly respond to the synergy of cocaine trafficking/consumption and the HIV/AIDS epidemic, Brazil has included harm reduction strategies in its public health agenda since the mid 1990s. Purchase and possession of injecting equipment are legal in Brazil. The number of needle and syringe exchange programs (NSEP) operating has grown steadily since the first publicly-sponsored NSEP began in 1994 with the support of NGOs and the World Bank. As of November 2006, approximately 150 NSEPs were operating in Brazil, more than in any other middle or low-income country, the vast majority funded by the BMoH and state/municipal health secretariats (BMoH, 2006b). Studies suggest that NSEPs in major urban areas have successfully reduced rates of needle sharing and HIV prevalence (Bastos et al., 2005). However, many NSEPs lack managerial capacity, proper stock management, and a stable and well-trained staff (Fonseca et al., 2006), which have resulted in less than optimal outcomes in some settings (Hacker et al., 2006; Bastos et al., 2006b).

Brazil provides treatment and care to the largest number of IDUs living with HIV/AIDS outside high-income countries (Aceijas et al., 2006). Despite this accomplishment, the management of HIV-positive cocaine users remains a challenge. There are several reasons for this including the dynamic nature of cocaine dependence, the limitations of most drug treatment centers and HIV referral units in Brazil, which lack well-trained and motivated staff and the absence of an effective pharmacotherapy to avoid the frequent relapses cocaine dependents typically experience (Vocci & Elkashef, 2005; McCance-Katz et al., 2001). Other impediments to proper management and care of HIV-positive cocaine users include stigma, poverty and the strong overlap between drug consumption, trafficking and overt violence in the region. Some successful experiences in specialized case-management to address the clinical and psychosocial needs of this population, however, have been implemented since the early 1990s (Malta et al., 2003).

A collaborative regional effort is currently also being implemented between the Pan-American Health Organization, the BMoH and some reference centers to improve the access of drug users living with HIV/AIDS to HAART in the Latin American region. Local experts developed guidelines for the management of HIV-positive cocaine users which will be distributed in regional public health facilities free of charge. Several trainings and meetings have been implemented in the region, targeting mainly health professionals, political leaders, affected communities and local NGOs.

Collaboration and Conflict: Prevention Strategies and the Role of Civil Society

Civil society organizations and gay activism had a key role in shaping the Brazilian response to the HIV/AIDS epidemic, particularly during the 1980s (Daniel & Parker, 1993; Parker, 1993; Parker et al., 2000). In the early 1980s, the Brazilian federal government largely ignored AIDS; the epidemic was viewed as a problem of gay men, sex workers and other marginalized groups, rather than a general public health threat. In response, NGOs and the São Paulo state Health Ministry filled the AIDS education void by campaigning for and shaping more effective prevention strategies. Newly formed AIDS NGOs played a key role in the development and implementation of most prevention programs targeting hard-hit populations, such as sex workers and MSM.

In this period, because there were no effective treatments for PLWHA, contracting HIV was associated with strong social stigma and PLWHA frequently faced discrimination. As a result, the social consequences of contracting HIV were equally as dire as the health consequences. It was in this social context that Brazil's first AIDS programs developed. These programs, based in São Paulo, were grounded in a human rights-based approach and focused on including vulnerable populations in program implementation, countering stigma and discrimination, educating the general population about HIV risks, and preserving the human rights and civil liberties of PLWHA. AIDS activists and public servants within the São Paulo health ministry used political activism to stimulate public policy debates about HIV/AIDS and effectively used the mass media to disseminate their messages.

Civil society movements fostered the adoption of local prevention campaigns, initially in the larger metropolitan cities such as São Paulo and Rio de Janeiro. In 1985, a partnership between gay men, human rights activists, and health professionals launched the first AIDS NGO in Brazil, GAPA, an AIDS Prevention and Support Group, in São Paulo. GAPA soon became a key model, fostering the development of similar NGOs in other cities throughout the country. In Rio de Janeiro, researchers, health professionals and gay activists founded Brazilian Interdisciplinary AIDS Association (ABIA), in 1986, and in 1989 the first self-identified HIV-positive advocacy group, Grupo Pela VIDDA, run by PLWHA was launched.

Throughout the late 1980s and early 1990s, the rebirth of grassroots civil society movements after 25 years of dictatorship led to the organization of NGOs targeting AIDS and many other health and social challenges all over the country. Productive collaboration between NGOs and the government alternated with periods of dissent and eventual conflict. These periods included the political turmoil that culminated in the impeachment of President Fernando Collor de Mello, protests against health budget cuts implemented by President Fernando Henrique Cardoso, in his first term (Bastos et al., 2001), and when ABIA and other NGOs initiated litigation against agreements reached by the BMoH and drug companies over the costs of some ARVs, during President Luis Inácio Lula da Silva's first term.

Since the early 1990s, however, the Brazilian AIDS Program has managed to sustain its commitment to preserving the human rights of marginalized communities such as IDUs and transvestites as a key focus of its policies. For instance, in 2005, the Brazilian government rejected USD 40 million in grants to fight HIV/AIDS, because it required grantees to sign a statement condemning prostitution, which the Brazilian government believed only increased stigma and reduced the efficacy of prevention campaigns (Hinchberger, 2005). NGOs representing sex workers, IDUs, gay and lesbian, bisexual and transgender populations, PLWHA, and other groups affected by the epidemic have received significant funding from the government to implement prevention initiatives (Berkman et al., 2005). Interestingly, the fact that the federal government provides core funding for most NGOs and that there are close links between NGOs and the BMoH (with a high commuting rate of key personnel between the government and different organizations) may have impacted the autonomy of such institutions.

Youth Focus

Adolescents and young adults comprise another key population to be targeted by prevention strategies. The BMoH started promoting lectures, workshops and debates related to HIV/AIDS, STIs and unwanted pregnancy prevention in public schools in the mid-1990s for students aged 14 years or older. This initiative resulted from a collaborative effort of the BMoH, the Brazilian Ministry of Education and the United Nations Educational Scientific and Cultural Organization (UNESCO). According to a study conducted by Camargo (2003), 60.2% of all Brazilian public schools have some kind of STI/AIDS prevention programs; 29.7% of elementary schools and 96.2% of high-schools. Some schools also

offer a special training to adolescents who would like to become peer-educators within their own school.

Wherever the local parents' advisory boards do agree, the government also provides free condoms inside public schools. This continues to cause controversy and is usually condemned by the Catholic Church and conservative groups. As a result, such initiatives have been implemented only recently and are restricted to some contexts and municipalities. Only 10% of all public schools actually provide free male condoms for their students (Camargo, 2003).

Paiva and colleagues (Paiva et al., 2006) found that approximately 68% of Municipal Health Secretariats all over Brazil allocate resources for STI and HIV/AIDS prevention in their respective public school networks. However, the majority (88%) do not distribute male condoms. Lack of trained human resources is one of the primary reasons indicated by the program coordinators for the failure to implement prevention initiatives with youth in schools, with 35% stating they do not possess the necessary trained staff. In order to reach youth who are not currently attending public schools, the BMoH initiated in 2005 several interventions targeting street children and youth living in rehabilitation facilities/shelters. These initiatives have not yet been evaluated.

Management and Care of People Living with AIDS

Access to Antiretroviral Medicines

In 1991, though the federal government had committed to providing AZT to PLWHA, it was not widely available (Bastos et al., 2001). During the following five years, NGOs and activists filed lawsuits against state, local and federal governments for failure to uphold the 1988 Constitutional guarantee of health care, which they argued included drugs for AIDS treatment. Ultimately a Brazilian federal law passed in 1996 guaranteed universal free access to ARVs and any other medications for AIDS and associated conditions. This law centralized formerly disparate AIDS treatment policies in Brazil and helped stabilize access to drugs for AIDS treatment.

As of June 2005, approximately 161,000 HIV-infected individuals in Brazil were taking HAART. This corresponds to approximately 27% of the estimated 600,000 PLWHA (BMoH, 2006a). Brazilian treatment guidelines state that any symptomatic HIV-infected individual or asymptomatic HIV-infected individual with a CD4 count below 200 cells/mm^3 is eligible to receive free HAART. Individuals with CD4 counts of between 200 and 350 cells/mm^3 are monitored closely and considered for treatment (BMoH, 2006b).

Currently, 17 ARVs, including nucleotide reverse transcriptase inhibitors; protease inhibitors; non-nucleotide reverse transcriptase inhibitors; and one entry inhibitor, which is reserved for late-stage AIDS patients, are distributed by over 600 dispensing units located throughout Brazil. Antiretroviral treatment (ART) in Brazil is both administered and financed publicly. Only public clinics accredited by the federal government can dispense ARVs. Outpatient services, clinics, and hospitals can all apply for accreditation, which requires previous experience working with PLWHA, demonstration of sufficiently trained staff, and basic pharmacy and laboratory capabilities (BMoH, 2006b).

While drugs for HAART are financed by the federal government, responsibility for distribution and monitoring of HAART is shared between municipal,

state, and federal governments in accordance with the delegation of health care responsibilities under Brazil's National Health System, the Sistema Único de Saúde. Primary care doctors are responsible for the day-to-day treatment and follow-up of PLWHA, including prophylaxis and treatment for opportunistic infections, both before and after AIDS diagnoses. When complexities in care arise, an individual is usually referred to secondary or tertiary care centers, most of which are jointly supervised and run by the federal government, universities, and research centers. The federal government is responsible for setting national treatment standards and guidelines, accrediting primary, secondary and tertiary care units for the treatment of AIDS, and maintaining national networks for AIDS case notification, patient monitoring, and medication tracking (Bastos et al., 2001; Levi & Vitoria, 2002; Galvao, 2002; Teixeira et al., 2004).

Treatment Monitoring

As Brazil launched its ambitious plan to provide universal access to ARVs, health professionals and managers realized that while an appropriate infrastructure was solidly established in a few reference centers, such as university and research institutes located in the southeast and south, many facilities were seriously deficient. As a consequence, the decision was made to establish national networks on CD4 counts, viral loads and more recently on HIV genotyping (Bastos et al., 2001). These national treatment standards and national networks for patient monitoring have been crucial in ensuring universal access to quality HAART despite heterogeneity in resources, laboratory capacity, and trained staff between Brazilian regions, localities and health facilities (Melchior et al., 2006).

Nationwide laboratory networks provide ongoing patient follow-up, including CD4 counts and viral loads, and track medication prescriptions. However, regional disparities have complicated the effective implementation of national networks. While reference centers in major urban areas are linked via the internet, dispensing units in other regions of Brazil often rely on paper reporting for AIDS treatment services. Delays in return of laboratory results vary widely by region.

Adherence and Viral Resistance

Despite the undeniable impact HAART has on patient quality of life, treatment adherence can present challenges in resource-limited settings. The bureaucracy of drug distribution as well as planning errors in producing and purchasing ARV drugs may pose problems, such as halts or interruptions in medication delivery (Chequer et al., 2002). Fortunately, such interruptions have been extremely rare in Brazil (Melchior et al., 2006). The emergence and transmission of HIV strains resistant to HAART have also been cited as potentially disastrous consequences of expanded access to HAART in resource-limited settings. While available evidence suggests that resistant HIV is becoming an increasing problem in Brazil, as it is in the U.S., Europe, and other settings where HAART is widely available, drug resistance among both treatment-experienced and treatment-naïve populations observed to date in Brazil remains no higher than in developed nations (Petersen et al., 2006).

A 2004 national study of adherence to HAART was conducted by the group QUALIAIDS, in the Department of Preventive Medicine, University of São

Paulo (USP). The overall level of ART adherence was 75% and important associations with the nature of therapeutic schemes and duration of treatment were found (Nemes et al., 2004). Other research has explored different aspects of adherence, including patients' difficulties managing complex drug regimens (Remien et al., 2007), the need to improve provider's training and reduce their caseloads (Malta et al., 2005), and to improve patient-provider communication, including increasing the frequency of open-ended, nonjudgmental dialogue initiated by care providers (Fehringer et al., 2006).

Monitoring and Evaluating the Brazilian HIV/AIDS Program: Current Challenges and Main Achievements

The Pressing Need to Monitor and Evaluate

It is difficult to attribute Brazil's apparent success in controlling the HIV/AIDS epidemic to any one aspect of its comprehensive treatment and prevention strategy. However, the fact that the Brazilian government made the containment of their HIV epidemic a high political priority facilitated development and sustainability of its broad HIV/AIDS program. Free and universal access to HAART in 1996 resulted in population-wide reductions in AIDS mortality (Marins et al., 2003; Hacker et al., 2004). Universal access may also have contributed to the subsequent stabilization observed in AIDS incidence by decreasing HIV transmission. Moreover, HAART may reduce the infectivity of HIV-infected individuals (Porco et al., 2004), provide incentive for HIV testing, and decrease the stigma surrounding HIV infection (Castro & Farmer, 2005; Montaner et al., 2006).

Many issues remain, however, in research and the broader public health agenda. There is a concern that gains from HAART may be reverted at the individual and population level in the foreseeable future in Brazil and globally (Blower et al., 2000; Boily et al., 2004, 2005). The impact of HAART on behavior change in Brazil has not been thoroughly explored. Changes in transmission dynamics secondary to the recomposition of social networks is another issue which needs to be evaluated. In addition, few data are available about the efficacy of specific prevention initiatives. The World Bank's 2004 Program Assessment document noted that Brazil has not conducted sufficient monitoring and evaluation to ascertain the impact of its prevention programs in reducing HIV transmission (Vaillancourt, 2004).

Evaluation of public hea1th programs is not a common practice in Brazil and local expertise in monitoring and evaluation is somewhat limited. The World Bank's 2004 assessment prompted Brazil's National AIDS Program to create a Monitoring and Evaluation Project designed to foster ongoing monitoring and evaluation programs. Building a comprehensive evaluation plan involved three dimensions: international cooperation, capacity building in evaluation and the construction of a monitoring system of AIDS-related indicators.

Implementing MonitorAIDS

This monitoring system, MonitorAIDS, was developed by the BMoH/National AIDS and STD Program (NAP), the Department of Information on Health

of the Center for Scientific and Technological Information at FIOCRUZ and the Centers for Disease Control and Prevention's Global AIDS Program Office in Brazil. This user-friendly web-based monitoring system assembles data from BMoH information systems, surveys and specific studies. Indicators were developed to facilitate effective monitoring of HIV/AIDS and other sexually transmitted diseases (STDs), to enable evaluation of current NAP programs, and to use to benchmark program performance in future evaluations (Rugg et al. & HIV Prevention Indicators Field Collaborative, 2000). Indicators are presented in two ways. The first (Monitoring Classification) is based upon the HIV/AIDS Survey Indicator Database in which indicators are organized by programmatic area. The second mirrors the logic model of the National Evaluation Plan, issued by the BMoH in 2000, and regularly updated thereafter (Bastos, 2002). Indicators proposed by UNGASS (United Nations General Assembly Special Session on HIV/AIDS) were also adopted in the development of MonitorAIDS. Two groups of indicators, which were closely related to the monitoring of the epidemic dynamics among vulnerable populations (Barbosa-Júnior et al., 2006) were given priority and were analyzed in 2002 and 2005 as part of the monitoring of the progress of the UNGASS Declaration of Commitment (UNAIDS, 2002, 2005).

Within MonitorAIDS, monitoring indicators are classified in three broad areas: Contextual Indicators, Program Indicators, and Impact Indicators. Contextual indicators include demographic and socioeconomic features of the population, as well as national health system indicators. Program indicators are divided into fourteen sub-areas related to NAP activities. These sub-areas contain indicators related to individual vulnerability, prevention strategies, care, AIDS surveillance and STD prevention and control. Impact indicators analyze the impact of STD/AIDS control efforts on morbidity and mortality. In addition, equity was considered as one of the key principles in the analysis of indicators since social factors are fundamental in determining patterns of morbidity, mortality and access to healthcare in Brazil.

Several information systems from the BMoH and a number of specific studies were used for estimating the MonitorAIDS indicators. Key studies were: (a) Brazilian Army Conscripts Surveys (BMoH, 2002b; Szwarcwald et al., 2000b; Carvalho, 2001; Szwarcwald et al., 2005a); (b) PCAP-BR (Survey of Knowledge, Attitudes and Practices of the Brazilian Population) (Szwarcwald et al., 2005b; BMoH, 2006d); (c) Parturient Sentinel Surveillance Study.(Szwarcwald & Castilho, 2000; Szwarcwald & Carvalho, 2001; Souza Junior et al., 2004); (d) Brazilian Multi-center Collaborative Project on Mother-to-Child Transmission of HIV (Brazilian Pediatric Society, in cooperation with the NAP); and (e) STD and AIDS Accounts.(BMoH, 2000a).

The Brazilian Response as Tracked by MonitorAIDS

Information provided by MonitorAIDS has been used to formulate policies, select appropriate interventions and optimize implementation of national program activities at national, state and municipal levels. Following are some of its main findings:

Knowledge About HIV Transmission

In the 2004 Survey of Knowledge, Attitudes and Practices of the Brazilian Population, 91% of those surveyed cited "having sexual relations" as a means of transmitting HIV while 67% answered the five traditional questions proposed by UNGASS correctly, showing that Brazil ranks as one of the highest countries internationally with respect to HIV knowledge (United Nations, 2004).

Sexual Practices

Results from the same survey reveal that approximately 90% of the Brazilian population aged 15–54 years is sexually-active and 81% were sexually active in the year prior to the study. About 20% of participants reported having more than 10 lifetime partners and 7% of those aged 15–24 years reported having more than 5 casual partners in the last year. Condom use is more frequent among the young and among those with casual partners: 74% of participants 15–24 years of age reported using a condom during their last sexual relations and 59% reported regular use of condoms with casual partners. Overall condom use varied from 58% in the highest socioeconomic class to 48% in the lowest (United Nations, 2004). Studies with Brazilian Army conscripts found that regular condom use among young males increased from 38%, in 1997, to 46–50% during the period of 1999–2002 and that condom use increased most with paid sexual partners (Fonseca & Bastos, 2007).

Indicators on knowledge and sexual practices show that populations with the lowest socioeconomic status have the worst level of information about transmission of HIV, the highest rate of sexual contact and frequently practice risky sex. Moreover, analyses by equity show that women from the lowest socioeconomic levels have the least access to the health system, for accessing periodic gynecological exams, getting prenatal care or for having an HIV test.

HIV Testing

HIV testing is encouraged and provided freely in public health clinics. Twenty-eight percent of the sexually-active population has been tested at least once in their lifetime. A larger proportion of women aged 25–39 years have been tested because of their access to prenatal care. Important differences were noted in HIV testing history by socioeconomic status for both males and females. Forty-three percent of sexually-active women from the highest-socioeconomic level have been tested compared to 28% from the lowest levels (Fonseca & Bastos, 2007).

Vulnerable Populations

For concentrated epidemics such as Brazil's, interventions targeted to at-risk populations can significantly reduce the incidence and prevalence of HIV (Boily et al., 2002). Additionally, the network of sexual contacts between groups at low-risk and those at high-risk are particularly important to the epidemic, in such a way that very small changes in the rate of contact between the general and core, high-risk populations, can decrease or significantly increase the dissemination of HIV/AIDS (Boily & Masse, 1997).

In this context, indicators that monitor epidemic dynamics among some especially vulnerable populations have been prioritized. The NAP has been dedicated to the development, adaptation, and sharing of sampling methodologies for hard-to-reach populations. Such activities are geared towards estimating the size of such vulnerable populations, as well as obtaining more information regarding their knowledge, attitudes, and practices using special sampling procedures, such as Respondent Driven Sampling and Time Location Sampling (Heckathorn, 1997; McFarland & Cáceres, 2001; Stueve et al., 2001).

In 2004, the National Survey on Knowledge, Attitudes and Practices of the Brazilian Population included questions about sexual orientation, sexual partnership in the last year and questions on the (mis)use of legal and illegal substances. In this way, it was possible to measure the size of vulnerable populations, through the recognition of populations of MSM, IDUs, sex workers and their clients. Among men aged 15–49 years it was estimated that 3.2% have sex with other men. This corresponds to approximately 1.5 million men in the country. Among sexually-active men, 3.5% are MSM; 2% reported only having sex with other men and 1.5% reported having sex with both men and women. Among women 15–49 years of age, 1% reported receiving money or gifts in exchange for sex in the last year, whereas 4.6% of men aged 15–49 paid at least once to have sex in the previous year. As for injecting substances: 0.9% of respondents reported that they had injected drugs at least once in their lifetime (1.4% males; 0.4% females) and 0.2% said they currently inject drugs (excluding drugs used for medical purposes) (Fonseca & Bastos, 2007) .

Mother-to-Child Transmission

Prior to the institution of appropriate prophylaxis (according to the protocol ACTG 076 and subsequent developments, as reviewed by Mofenson & McIntyre, 2000), Brazil had a vertical transmission rate of 16% (Tess et al., 1998). Recently, an evaluation conducted by the Brazilian Pediatric Society reported a 7% vertical transmission rate for Brazil. However, there was great variation between regions, with 15% reported for the North region and 6% in the South.

Although the interventions to reduce mother to child-transmission of HIV have had a great impact, it is estimated that only 57% of infected pregnant women had access to HAART in 2000. The reasons for this are varied and include: absence of prenatal care, initiation of prenatal care in the last trimester, prenatal attention without request for an HIV test, failure to receive timely results of the HIV test, and failure to receive HIV test results. Access to HAART comes with HIV testing coverage which is defined as the proportion of women who attended prenatal care visits (at least one visit), requested HIV testing during pregnancy and knowledge of HIV test result before labor. Huge inequalities are seen in HIV testing coverage between the Northeastern (31%) and Southern regions (78%); illiterate mothers (26%) and those who have completed basic education (64%) (Souza Junior et al., 2004). Despite the fact that prophylactic resources to reduce transmission are available throughout the country, coverage of HIV testing during pregnancy among women of the lowest socioeconomic status remains insufficient.

Prevalence of HIV Infection in the Brazilian Population

In 2004, HIV prevalence among the population aged 15–49 years old was estimated at 0.61%, corresponding to approximately 594,000 infections (209,000 women and 385,000 men). These numbers were similar to those obtained in the 2000 study. At the same time, HIV prevalence among male conscripts in both 1998 and 2002 was estimated to be 0.09% (Szwarcwald et al., 2000b, 2005b). These results may be an indication that the prevalence of HIV is stabilizing as a result of efforts to control dissemination of the infection within the Brazilian population.

Financing the Response to HIV/AIDS in Brazil: Achievements and Challenges

The Contribution of Domestic Funds and International Loans

Since 1994, the World Bank has loaned Brazil a total of USD 425 million for AIDS programs. Brazil has contributed USD 325 million to match World Bank contributions. Though World Bank loans do not finance the costs of production, procurement, delivery or monitoring of ARVs in Brazil, the first two World Bank loans helped establish important health system infrastructure and human resource training that has facilitated implementation of Brazil's large-scale treatment program. Similarly, the third World Bank loan, first dispersed in 2003, focuses on infrastructure development for decentralization of AIDS care and treatment services (Brazil AIDS and STD Control Project: World Bank Staff Appraisal Report 1993; Project Appraisal Document on a Proposed Loan in the Amount of $165 Million to the Federative Republic of Brazil for a Second AIDS and STD Control Project, 1998; Brazil AIDS and STD Control III, 2003).

The procurement, production and distribution of ARVs have been funded by the Brazilian government which has adopted several strategies to reduce the costs of HAART. Brazil, with the tenth largest pharmaceutical industry in the world and several government run drug factories, has produced generic drugs since the 1950s. Between 1971 and 1997, Brazil did not recognize intellectual property rights for drug processes and products. In the early 1990s, both public and private sector Brazil began producing some generic ARVs to meet new population demand. However, under pressure from the United States government to recognize intellectual property rights and improve the quality of generic medicines, Brazil adopted an Industrial Property Law in 1996, nine years before official requirements by the World Trade Organization (WTO) (WTO, 1995; Brazil, 1996). The new law recognized drug product and process patents and restricted public and private drug production to drugs introduced in the Brazilian marketplace before May of 1997. In November of 1996, the Brazilian Congress approved Brazil's law guaranteeing free and universal access to HAART for all PLWHA (Lei 9.313, 1996). As a result of these two laws, the state was required to provide free and universal access to HAART to all PLWHA, but generic drug production was restricted to drugs introduced before May of 1997.

In 1998, to meet increasing population demand for HAART, Brazil began producing generic ARVs on a large scale. Today, Brazil's public drug factories produce the eight drugs in its current treatment guidelines that were

introduced in Brazil prior to May of 1997. The remaining eleven patented drugs in Brazil's guidelines are imported from multinational pharmaceutical companies (Grangeiro et al., 2006; Pinheiro et al., 2006; Galvao, 2002; Nunn et al., 2007). Since 2001, Brazil has successfully negotiated deep drug discounts for five of the patented medicines consuming a large part of its treatment budget, by threatening to issue a compulsory license. Under WTO rules, a compulsory license allows governments to produce or grant a third party authority to produce a drug without consent of the patent holder in cases of national public health emergency, among other limited circumstances (WTO 1995, 2001; Grangeiro et al., 2006).

Fluctuating Costs: Prospects for the Near Future

Local production of generic ARVs and steep discounts for patented medications have resulted in large cost savings in providing free and universal access to HAART. Recent research finds that price negotiations saved Brazil USD1.2 billion from 2001 to 2005 (Nunn et al., 2007). Both local production and price negotiations have also resulted in declines in average per patient per year (PPPY) HAART costs. In 1997, average PPPY HAART costs were USD 4,860, but dropped to USD 1,945 in 2001 as a result of Brazil's strategy of scaling local ARV production in the late 1990s. Between 2001 and 2003, PPPY HAART dropped even further to USD 1,120 due to price negotiations and improving efficiencies in local ARV drug production. However, between 2003 and 2005, in spite of continued price negotiations, the average cost of HAART increased to USD 2,577 (Nunn et al., 2007) .

A small share of cost increases can be attributed to the rising cost of producing generic drugs locally. Most of the cost increases, however, stem from the increasing number of patients taking newer, patented medicines (Grangeiro et al., 2006; Nunn et al., 2007). As patients live longer, they tend to experience undesirable side effects, clinical failures and/or develop resistance to drugs. They usually switch from first to second or third line drug regimens. Most second and third line ARVs are under patent and are therefore ten to twenty times more expensive than locally-produced generics (Grangeiro et al., 2006; Nunn et al., 2007). Additionally, Brazil provides an exceptionally high standard of care relative to other developing countries. For example, the 2006 World Health Organization (WHO) Guidelines for HAART in resource-limited settings recommends 12 ARVs. Brazil, in contrast, offers 18 drugs; many of the patented drugs offered as second and third line therapies in other developing countries are now considered first line therapies in Brazil. Brazil even offers salvage therapy for late-stage AIDS patients (BMoH, 2006c; WHO, 2006).

In the near to long-term, Brazil will face several clinical and ultimately financial challenges associated with long-term HAART. Challenges presented by PLWHA living longer, and emerging drug-resistant HIV strains will be compounded by increasing numbers of patients developing side-effects associated with long-term HAART and increasing numbers of patients requiring salvage therapy due to repeated virological and clinical failures. Because these clinical problems require complex case management and further reliance on patented ARVs, they ultimately also become economic challenges.

AIDS activists and public officials often cite the rising costs of AIDS treatment as a threat to the sustainability of the treatment program. However, a close look at health expenditure trends finds that total public health expenditure rose in tandem with HAART costs and that even as HAART costs doubled, ARVs accounted for only approximately 3% of total public health expenditure for each year from 2001 to 2005. Moreover, because overall drug costs increased dramatically from 2001 to 2005, HAART costs declined from 50 to 36% of total public drug costs (BMoH – CAA, 2005). Because BMoH spending increases have more than offset HAART cost increases, to date, rising HAART costs seem not to have directly imperiled other public health or drug spending in Brazil. However, if costs begin to rise more than general health system spending, the increasing cost of HAART may eventually pose an economic challenge for Brazil's Health Ministry.

International Cooperation

The Broad Context

Since 2001, Brazil has been very active in several international fora, promoting greater access to medicines in developing countries and sponsoring resolutions at the UN Commission and Sub-Commission on Human Rights, the World Health Assembly (WHA), UNGASS and the WTO. In 2001, at the WHA, the WHO's supreme decision-making body, Brazil sponsored resolutions that called for creation of a global fund for major infectious diseases. That resolution was ultimately approved and the Global Fund to Fight AIDS Tuberculosis and Malaria, which was created later that year, began dispersing funds in 2003. Brazil's 2001 WHA resolutions also led to WHO endorsement of generic drug use; improved WHO drug quality standards; and inclusion of ARVs in the WHO Essential Medicines List, which includes the minimum drugs that all countries should make available to their populations (WHA, 2001a, b). In other resolutions since 2003, Brazil, in collaboration with other developing countries, has also spearheaded efforts to change global research and development paradigms to address neglected diseases (WHA, 2003, 2006).

Brazil also sponsored a resolution entitled, "Access to Medication in the Context of Pandemics such as HIV/AIDS" at the UN Commission for Human Rights. That resolution defined access to medicines as part of the fundamental human right to health, and that resolution was re-affirmed and expanded from 2002 to 2005 (UNCHR, 2001). In 2001, Brazil was also involved in shaping the 2001 WTO Doha Ministerial Declaration to reflect developing country public health interests. The Doha Declaration on the TRIPS Agreement and Public Health affirmed the right of developing countries to declare national emergencies and issue compulsory licenses in cases of public health emergency (WTO, 2001; Abbott, 2002). In addition to allowing Brazil to preserve its tradition of threatening to issue compulsory licenses to induce discounts from pharmaceutical companies, the WTO's recognition of important exceptions to the TRIPS agreement also legitimized the links and associated challenges between trade agreements and public health problems. This has provided momentum for

ongoing global institutional reforms related to essential medicines and AIDS treatment.

All of these international contributions have helped change global thinking about access to essential medicines and drugs for AIDS treatment. In part as a result of these global institutional contributions, AIDS treatment has become a reality in many developing countries.

Regional Collaboration

South-south cooperation in the field of HIV/AIDS has been pursued by both the Brazilian government and different NGOs since the onset of the HIV/AIDS epidemic. Since 1996, Brazil has been a key partner of the Group for Horizontal Technical Cooperation in HIV/AIDS for Latin America and the Caribbean (the Group) (BMoH, 2000b). The 1996 summit of the Group, which was held in Rio de Janeiro, brought together representatives and leaders from ten countries. At the summit, goals of cooperation were defined and a rotational Technical Secretariat created. Support from UNAIDS has brought increasing cooperation and membership. In 2000, 21 countries had joined the Group. The Group has been pivotal in drug procurement initiatives in the region, including promoting price negotiations for ARVs (Chequer et al., 2002).

Brazil's international cooperation program, conducted in partnership with the Ford Foundation was officially launched on May 22, 2002, with an initial appropriation of USD 1 million for ten pilot projects of USD 100,000 each (BMoH, 2002a). Through these projects Brazilian experience and expertise in HIV/AIDS management and care has been shared with less developed countries as they implement domestic initiatives to establish/scale up ARV treatment. Brazil's government contributes technical assistance, training in HIV/AIDS treatment and management of ARV procurement and delivery logistics, and generic medicines produced by Brazil's state-owned drug companies, such as Farmanguinhos (a branch of the Oswaldo Cruz Foundation – FIOCRUZ) (Pinheiro et al., 2006). In one example, Brazil's contributions to the epidemic in Paraguay and Bolivia, while modest in terms of scope, have been essential as both Paraguay and Bolivia have been facing political instability and a shortage and discontinuity of funds. For about 800 patients in each country, Brazilian generics have provided a stable source of first line treatments (Pimenta et al., 2006).

Providing International Support

Brazil has been also working in close cooperation with several countries in Lusophone Africa, including Angola, Mozambique, Cape Verde, Guinea Bissau, and Sao-Tome. Brazil has supported a variety of initiatives including: in Cape Verde, prevention of mother-to-child transmission of HIV; in Guinea Bissau preliminary programs in management and care; and in Mozambique an educational program called, "Estamos Juntos" ("We're Together"), which trains teachers and develops educational materials targeting issues such as HIV prevention and sexuality (United Nations, 2006).

Brazil has worked to fully implement UNGASS goals domestically, and has helped countries from Latin America and Lusophone Africa, through technical cooperation and advocacy, to overcome obstacles in their full implementation of UNGASS goals (Bastos et al., 2006a).

Final Remarks

Brazil's reforms of the 1980s produced a health care system based on human rights principles rather than ability to pay. This commitment played a major role in shaping the nation's response to the HIV epidemic, as is particularly evident in Brazil's provision of free and universal HAART. This policy of unrestricted access to high-quality medicines has led to dramatic declines in AIDS-related morbidity and mortality across regions, social strata and among both men and women. Furthermore, current data suggest that Brazil's challenges with adherence to medications and the transmission of resistant HIV strains are no greater than in developed countries. In the more than 25 years of the epidemic, Brazil has maintained a concentrated epidemic, with a prevalence of infection of HIV in the general population of less than 1% (Brito et al., 2001). Indeed in most regions, especially the southeast, the epicenter of Brazil's epidemic, incidence is declining.

Despite these successes, challenges remain. Dramatic disparities between socioeconomic groups and geographic regions in Brazil remain a challenge to the realization of free and universal access health services both within the HIV program and across the Brazilian health system. Access to both treatment and prevention services need to be improved in remote regions of Brazil, and more effectively targeted at marginalized populations. Expanded clinical, behavioral and laboratory monitoring should be coupled with efforts to improve patient adherence to medications and clinical follow-up, and prevention services should be targeted to individuals receiving treatment (Kerrigan et al., 2006; Fehringer et al., 2006). It will also be important to extend important lessons learned in the successful implementation of the NAP program to other parts of the Brazilian health system which remain poorly funded and less organized than the HIV/AIDS program. Horizontal integration of the heretofore vertical HIV program in the larger Brazilian health system, would improve both HIV care and the health system itself.

Ultimately, much of Brazil's success in the HIV/AIDS epidemic can be attributed to support from the federal government. Federal provision of a legal and organizational framework has proved crucial to the success of Brazil's program. In particular, federal laws and institutional support fostered the production of generic drugs and the negotiation of pricing agreements with drug companies, strategies that have made universal HAART access financially feasible. National laboratory networks have played a major role in ensuring quality of care in regions with less health care infrastructure. Human rights and activism also played a major role in both generating and sustaining political and financial commitments to Brazil's HIV/AIDS program. These efforts should be encouraged and ideally, integrated with public policy responses to the epidemic.

References

Abbott (2002). The Doha Declaration on the TRIPS Agreement and Public Health: Lighting a Dark Corner at the WTO. *Journal of International Economic Law, 5,* 469–505.

Aceijas, C., Oppenheimer, E., Stimson, G.V., Ashcroft, R.E., Matic, S., Hickman, M., & The Reference Group on HIV/AIDS Prevention and Care among IDU in Developing and Transitional Countries. (2006). Antiretroviral treatment for injecting drug users in developing and transitional countries 1 year before the end of the 'Treating 3 million by 2005. Making it happen. The WHO strategy' ('3by5'). *Addiction, 101,* 1246–53.

Almeida, C., Travassos, C., Porto, S., & Labra, M.E. (2000). Health Sector Reform in Brazil: A Case Study of Inequity. *International Journal of Health Services: Planning, Administration, Evaluation, 30*, 129–162.

Andrade, T.M., Dourado, I., & Galvao-Castro, B. (1998). Associations among HTLV-I, HTLV-II, and HIV in injecting drug users in Salvador, Brazil. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology, 18*, 186–7.

Barbosa-Júnior, A., Pascom, A.R., Szwarcwald, C.L., Correia, C.D.B., Monteiro, L., & Simão, M.B.G. (2006). Proposed UNGASS indicators and the monitoring of the AIDS epidemic in Brazil. *Revista de Saúde Pública*, *40* (suppl.), 94–100.

Barcellos, C., & Bastos, F.I. (1996). Redes sociais e difusão da AIDS no Brasil. *Boletín de la Oficina Sanitaria Panamericana,* 121,11–24

Bastos, F.I. (2002). *Indicadores em DST/HIV/AIDS*: Referências bibliográficas selecionadas. Brasília: Ministério da Saúde.

Bastos, F.I., Bongertz, V., Teixeira, S.L., Morgado, M.G., & Hacker, M.A. (2005). Is human immunodeficiency virus/acquired immunodeficiency syndrome decreasing among Brazilian injection drug users? Recent findings and how to interpret them. *Memórias do Instituto Oswaldo Cruz, 100,* 91–6.

Bastos, F.I., Buchalla, C.M., Ayres, J.R., & da Silva, L.J. (2006a). Brazilian response to the HIV/AIDS epidemic, 2001–2005. *Revista de Saúde Pública, 40* (suppl.), 1–4.

Bastos, F.I., Fatima de Pina, M., & Szwarcwald, C.L. (2002). The social geography of HIV/AIDS among injection drug users in Brazil. *International J Drug Policy 13*(2), 137–144.

Bastos, F.I., Kerrigan, D., Malta, M., Carneiro-da-Cunha, C., & Strathdee, S.A. (2001). Treatment for HIV/AIDS in Brazil: strengths, challenges, and opportunities for operations research. *AIDScience 1* (15). www.aidscience.org

Bastos, F.I., Malta, M., Hacker, M.A., Petersen, M., Sudbrack, M., Colombo, M., Caiaffa W.T., & Project AjUDE II (2006b). Assessing needle exchange operations in a poor Brazilian community. *Substance Use and Misuse,* 41,937–51.

Berkman, A., Garcia, J., Munoz-Laboy, M., Paiva, V, & Parker, R. (2005). A critical analysis of the Brazilian response to HIV/AIDS: Lessons learned for controlling and mitigating the epidemic in developing countries. *American Journal of Public Health, 95*(7):1162–72.

Beyrer, C., Razak, M.H., Lisam, K., Chen, J., Lui, W., & Yu, X.F. (2000). Overland heroin trafficking routes and HIV-1 spread in south and south-east Asia. *AIDS, 14*, 75–83.

Blower, S.M., Gershengorn, H.B., & Grant, R.M. (2000). A tale of two futures: HIV and antiretroviral therapy in San Francisco. *Science, 287*, 650–4.

Boily, M.C., Bastos, F.I., Desai, K., & Masse, B. (2004). Changes in the transmission dynamics of the HIV epidemic after the wide-scale use of antiretroviral therapy could explain increases in sexually transmitted infections: Results from mathematical models. *Sexually Transmitted Diseases, 31*,100–13.

Boily, M.C., Godin, G., Hogben, M., Sherr, L., & Bastos, F.I. (2005). The impact of the transmission dynamics of the HIV/AIDS epidemic on sexual behaviour: A new

hypothesis to explain recent increases in risk taking-behaviour among men who have sex with men. *Medical Hypotheses, 65*, 215–26.

Boily, M.C., Lowndes, C., Alary, M. (2002). The impact of HIV epidemic phases on the effectiveness of core group interventions: Insights from mathematical models. *Sexual Transmitted Infectious, 78* (suppl. 1), 78–90.

Boily, M.C., & Masse, B. (1997), Mathematical models of disease transmission: A precious tool for the study of sexually transmitted diseases. *Canadian Journal of Public Health*, *88*, 255–65.

Brazil (1996). Federal Law. Lei de Propriedade Industrial. Lei N 9.2779/96. From May/14,1996.

Brazilian Ministry of Health (2000a). *Gasto público federal em 1997 e 1998 e estimativa do gasto nacional em 1998.* Série Avaliação no 2, Brasília: BMoH.

Brazilian Ministry of Health (2000b). *The Brazilian Response to HIV/AIDS*. Brasília: BMoH .

Brazilian Ministry of Health (2002a). International cooperation programme for HIV and AIDS prevention and control activities for other developing countries. Brasília: BMoH.

Brazilian Ministry of Health (2002b). *Pesquisa entre os conscritos do exército brasileiro, 1996–2000: Retratos do comportamento de risco do jovem brasileiro à infecção pelo HIV.* Série Estudos, Pesquisas e Avaliação no 2. Brasília: BMoH.

Brazilian Ministry of Health – CAA (Coordenação de Acompanhamento e Avaliação) (2005). *Execução Orçamentária e Financeira 2001–2005*. Brasília: BMoH (mimeo, background document).

Brazilian Ministry of Health – IDB (Indicadores e Dados Básicos do Brasil) (2005). Basic Health Indicators and Data. Available at www.datasus.gov.br. Accessed January 2007.

Brazilian Ministry of Health (2006a). AIDS/STDs Epidemiological Bulletin. Available at www.aids.gov.br, accessed in January 2007.

Brazilian Ministry of Health (2006b). Unidades de dispensação de anti-retrovirais. www.aids.gov.br, accessed in January 2007.

Brazilian Ministry of Health (2006c). *Recomendações para Terapia Anti-retroviral em Adultos e Adolescentes Infectados pelo HIV*. Brasília: BMoH.

Brazilian Ministry of Health (2006d). *Pesquisa de Conhecimentos, Atitudes e Práticas na População Brasileira 2004.* Brasília: BMoH.

Brito, A.M., Castilho, E.A., & Szwarcwald, C.L. (2001). AIDS and HIV infection in Brazil: A multifaceted epidemic. *Revista da Sociedade Brasileira de Medicina Tropical, 34*, 207–17.

Brito, A.M., Castilho, E.A., & Szwarcwald, C.L. (2005). Regional patterns of the temporal evolution of the AIDS epidemic in Brazil following the introduction of antiretroviral therapy. *The Brazilian Journal of Infectious Diseases, 9*, 9–19.

Caiaffa, W.T., Proietti, F.A., Carneiro-Proietti, A.B., Mingoti, S.A., Doneda, D., Gandolfi, D., Reis, A.C., & Epidemiological Study of Injection Drug Users in Brazil (AjUDE-Brasil Project) (2003). The dynamics of the human immunodeficiency virus epidemics in the south of Brazil: Increasing role of injection drug users. *Clinical Infectious Diseases, 37* (suppl. 5), S376–81.

Camargo, K.R. (2003). Prevenção do HIV: Desafios múltiplos. *Divulgação Saúde Debate, 70–80*:204–14.

Carvalho, M.F. (2001). Avaliação do uso do preservativo, segundo a experiência com drogas lícitas e ilícitas com conscritos do exército brasileiro, de Regiões Metropolitanas selecionadas e Distrito Federal. *Boletim Epidemiológico DST/AIDS*. Ano XIV n° 01.

Castro, A. & Farmer, P. (2005). Understanding and addressing AIDS-related stigma: From anthropological theory to clinical practice in Haiti. *American Journal of Public Health,* 95, 53–9.

Chequer, P., Cuchi, P., Mazin, R., & Garcia Calleja, J.M. (2002). Access to antiretroviral treatment in Latin American countries and the Caribbean. *AIDS,* 16 (suppl. 3), S50–7.

Chequer, P., Hearst, N., Hudes, E.S., Castilho, E., Rutherford, G., Loures, L., & Rodrigues, L. (1992). Determinants of survival in adult Brazilian AIDS patients, 1982–1989. *AIDS,* 6, 483–7.

Daniel, H. & Parker, R.G. (1993). *Sexuality, Politics and AIDS in Brazil.* London: The Falmer Press.

Davis, W.R., Johnson, B.D., Randolph, D., & Liberty, H.J. (2006). Risks for HIV infection among users and sellers of crack, powder cocaine and heroin in central Harlem: Implications for interventions. *AIDS Care*,18, 158–65.

Dourado, I., Veras, M.A., Barreira, D., & Brito, A.M. (2006). AIDS epidemic trends after the introduction of antiretroviral therapy in Brazil. *Revista de Saúde Pública, 40* (suppl.), 9–17.

Fehringer, J., Bastos, F.I., Massard, E., Maia, L., Pilotto, J.H., & Kerrigan, D. (2006). Supporting adherence to highly active antiretroviral therapy and protected sex among people living with HIV/AIDS: The role of patient-provider communication in Rio de Janeiro, Brazil. *AIDS Patient Care and STDS, 20*, 637–48.

Fonseca, M.G., & Bastos, F.I. (2007). Twenty-five years of the AIDS epidemic in Brazil: Main epidemiological findings, 1980–2005. *Cadernos de Saúde Pública*. *23*, (suppl. 3), S333–44.

Fonseca, M.G., Bastos, F.I., Derrico, M., Andrade, C.L., Travassos, C., & Szwarcwald, C.L. (2000). AIDS e grau de escolaridade no Brasil: Evolução temporal de 1986 a 1996. *Cadernos de Saúde Pública, 16,* (suppl. 1), 77–87.

Fonseca, M.G., & Castilho, EA. (1997). Casos de AIDS entre usuários de drogas injetáveis, Brasil, 1980–1997. *Boletim Epidemiológico, X ,* 6–14.

Fonseca, E.M., Ribeiro, J.M., Bertoni, N., Bastos. F.I. (2006). Syringe exchange programs in Brazil: Preliminary assessment of 45 programs. *Cadernos de Saúde Pública, 22,* 761–70.

Fonseca, M.G., Szwarcwald, C.L., & Bastos, F.I. (2002). A sociodemographic analysis of the AIDS epidemic in Brazil, 1989–1997. *Revista de Saúde Pública, 36,* 678–85.

Fonseca, M.G., Travassos, C., Bastos, F.I., Silva, N., & Szwarcwald, C.L. (2003). Distribuição social da AIDS no Brasil, segundo participação no mercado de trabalho, ocupação e status sócio-econômico dos casos de 1987 a 1998. *Cadernos de Saúde Pública 19,* 1351–63.

Galvao, J. (2002). Access to antiretroviral drugs in Brazil. *Lancet 360,* 1862–5.

Grangeiro, A., Teixeira, L., Bastos, F.I., & Teixeira, P. (2006). Sustainability of Brazilian policy for access to antiretroviral drugs. *Revista de Saúde Pública, 40* (suppl.), 60–9.

Hacker, M.A., Leite. I.C., Renton, A., Torres, T.G., Gracie, R., & Bastos, F.I. (2006). Reconstructing the AIDS epidemic among injection drug users in Brazil. *Cadernos de Saúde Pública, 22,* 751–60.

Hacker, M.A., Petersen, M.L., Enriquez, M., & Bastos, F.I. (2004). Highly active antiretroviral therapy in Brazil: The challenge of universal access in a context of social inequality. *Pan American Journal of Public Health, 16,* 78–83.

Heckathorn, D. (1997). Respondent driven sampling: A new approach to the study of hidden populations. *Social Problems, 44,* 174–99.

Hinchberger, B. (2005). Support for sex workers leaves Brazil without US cash. *Lancet; 366*(9489):883–4

Kalichman, A. (1993). AIDS and intravenous drug use (IVDU) in Brazil. In: M.G., Monteiro, J.A. Inciardi, (Eds.), *United States Binational Research*. (pp. 49–61). São Paulo: CEBRID.

Kerrigan, D., Bastos, F.I., Malta, M., Carneiro-da-Cunha, C., Pilotto, J.H., & Strathdee, S.A. (2006). The search for social validation and the sexual behavior of people living with HIV in Rio de Janeiro, Brazil: Understanding the role of treatment optimism in context. *Social Science and Medicine, 62*, 2386–96.

Levi, G.C., Vitoria, M.A. (2002). Fighting against AIDS: The Brazilian experience. *AIDS, 16,* 2373–83.

Lowndes, C.M., Bastos, F.I., Giffin, K., Reis, A.C.G.V., d'Orsi, E., & Alary, M. (2000). Differential trends in mortality from AIDS in men and women in Brazil, 1984–1995. *AIDS 14,* 1269–1273.

McCance-Katz, E.F., Kosten, T.A., & Kosten, T.R. (2001). Going from the bedside back to the bench with ecopipam: A new strategy for cocaine pharmacotherapy development. *Psychopharmacology, 155,* 327–9.

McFarland, W., & Cáceres, C.F. (2001). HIV surveillance among men who have sex with men. *AIDS, 15* (suppl. 3), S23–32.

Malta, M., Bastos, F.I., Pereira-Koller, E.M., Cunha, M.D., Marques, C., & Strathdee, S.A. (2006). A qualitative assessment of long distance truck drivers' vulnerability to HIV/AIDS in Itajai, southern Brazil. *AIDS Care, 18*, 489–96.

Malta, M., Carneiro-da-Cunha, C., Kerrigan, D., Strathdee, S.A., Monteiro, M., & Bastos FI. (2003). Case management of human immunodeficiency virus-infected injection drug users: A case study in Rio de Janeiro, Brazil. *Clinical Infectious Diseases, 37* (suppl. 5), S386–91.

Malta, M., Petersen, M.L., Clair, S., Freitas, F., & Bastos, F.I. (2005). Adherence to antiretroviral therapy: A qualitative study with physicians from Rio de Janeiro, Brazil. *Cadernos de Saúde Pública, 21,* 1424–32.

Marins, J.R., Jamal, L.F., Chen, S.Y., Barros, M.B., Hudes, E.S., Barbosa, A.A., Chequer, P., Teixeira, P.R., & Hearst, N. (2003). Dramatic improvement in survival among adult Brazilian AIDS patients. *AIDS, 17*, 1675–82.

Malta, M., Bastos, F.I., Pereira-Koller, E.M., Cunha, M.D., Marques, C., & Strathdee, S.A. (2006). A qualitative assessment of long distance truck drivers' vulnerability to HIV/AIDS in Itajai, southern Brazil. *AIDS Care, 18*, 489–96.

Melchior, R., Nemes, M.I., Basso, C.R., Castanheira, E.R., Alves, M.T., Buchalla, C.M., & Donini, A.A. (2006). Evaluation of the organizational structure of HIV/AIDS outpatient care in Brazil. *Revista de Saúde Pública, 40,* 143–51.

Mofenson, L.M., & McIntyre, J.A. (2000). Advances and research directions in the prevention of mother-to-child HIV-1 transmission. *Lancet*, *355*:2237–44.

Montaner, J.S., Hogg, R., Wood, E., Kerr, T., Tyndall, M., Levy, A.R., & Harrigan, P.R. (2006). The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *Lancet, 368,* 531–6.

Nemes, M.I., Carvalho, H.B., & Souza, M.F. (2004). Antiretroviral therapy adherence in Brazil. *AIDS* (suppl. 3), S15–20.

Nunn, A., Fonseca, E., Bastos, F.I., Gurskin, S, & Salomon, J. (2007). Evolution of antiretroviral drug costs in Brazil in the context of free and universal access to AIDS treatment. *Public Library of Science Medicine, 4*(11), e305.

Paiva, V.; Pupo, L.R.; & Barboza, R. (2006). The right to prevention and the challenges of reducing vulnerability to HIV in Brazil. *Revista de Saude Publica, 40* (suppl), 109–19.

Parker, R.G. (1994). Public policy, political activism, and AIDS in Brazil. In: Feldman, D (ed.), *Global AIDS Policy* (pp. 28–46). Westport, CT: Bergin and Garvey.

Parker, R.G., Easton, D., Klein, C.H. (2000). Structural barriers and facilitators in HIV prevention: A review of international research. AIDS; 14 (suppl. 1), S22–32.

Petersen, M.L., Boily, M.C., & Bastos, F.I. (2006). Assessing HIV resistance in developing countries: Brazil as a case study. *Pan American Journal of Public Health, 19*, 146–56.

Pimenta, C., Terto, Jr. V., Kamel, L., Maksud, I., & Raxach, J.C. (2006). *Acesso a tratamento de AIDS na Bolívia e no Paraguai.* Coleção ABIA 6. Rio de Janeiro: ABIA.

Pinheiro, E., Vasan, A., Kim, J.Y., Lee, E., Guimier, J.M., Perriens, J. (2006). Examining the production costs of antiretroviral drugs. *AIDS, 20,* 1745–52.

Porco, T.C., Martin, J.N., Page-Shafer, KA., Cheng, A., Charlebois, E., Grant, R.M., Osmond, D.H. (2004). Decline in HIV infectivity following the introduction of highly active antiretroviral therapy. *AIDS*, 18(1), 81–8.

Remien, R., Bastos, F. I., Terto Jr, V., Raxach, J.C., Pinto, R.M., Parker, R.G., Berkman, A, & Hacker, M.A. (2007). Assessing adherence to antiretroviral therapy (ART) in a context of universal access, in Rio de Janeiro, Brazil. *AIDS Care, 19*(6), 740–8.

Rugg, D.L., Heitgerd. J.L., Cotton, D.A., Broyles, S., Freeman, A., Lopez-Gomez, A.M., Cotten-Oldenburg, N.U., Page-Shafer, K.; HIV Prevention Indicators Field Collaborative (2000). CDC HIV prevention indicators: Monitoring and evaluating HIV prevention in the USA. *AIDS, 14*, 2003–13.

Souza Junior, P.R., Szwarcwald, C.L., Barbosa Junior, A., Carvalho, M.F., & Castilho, E.A. (2004). Infecção pelo HIV durante a gestação: Estudo-Sentinela Parturiente, Brasil, 2002. *Revista de Saúde Pública*, *38*, 764–72.

Stueve, A., O'Donnell, L.N., Duran, R., San Doval, A., Blome J. (2001). Time-space sampling in minority communities: Results with young Latino men who have sex with men. *American Journal Public Health, 91,* 922–6.

Szwarcwald, C.L., Andrade, C.L. & Bastos, F.I. (2002). Income inequality, residential poverty clustering and infant mortality: A study in Rio de Janeiro, Brazil. *Social Science and Medicine, 55*, 2083–92.

Szwarcwald, C.L., Barbosa-Junior, A., Pascom, A.R., & de Souza-Junior, P.R. (2005a). Knowledge, practices and behaviors related to HIV transmission among the Brazilian population in the 15–54 years age group, 2004. *AIDS, 19* (suppl. 4), S51–8.

Szwarcwald, C.L., Bastos, F.I., Esteves, M.A., de Andrade, C.L. (2000a). A disseminação da epidemia da AIDS no Brasil, no período de 1987–1996: Uma análise espacial. *Cadernos de Saude Publica, 16*(suppl. 1), 7–19.

Szwarcwald, C.L., & Carvalho, M.F. (2001). Estimativa do número de pessoas de 15 a 49 anos de idade infectadas pelo HIV no Brasil, 2000. *Boletim Epidemiológico XIV(1)*.

Szwarcwald, C.L., Carvalho, M.F., Barbosa Junior, A., Barreira, D., Speranza, F.A., Castilho, EA. (2005b). Temporal trends of HIV-related risk behavior among Brazilian military conscripts, 1997–2002. *Clinics, 60,* 367–74.

Szwarcwald, C.L., & Castilho, E.A. (2000). Estimativa do número de pessoas de 15 a 49 anos infectadas pelo HIV, Brasil, 1998 *Cadernos de Saúde Pública, 16* (suppl. 1), 135–41.

Szwarcwald, C.L., Castilho, E.A., Barbosa, A. Jr., Gomes, M.R., Costa, E.A., Maletta, B.V., de Carvalho, R.F., de Oliveira, S.R, & Chequer, P. (2000b). Comportamento de risco dos conscritos do Exército Brasileiro, 1998: Uma apreciação da infecção pelo HIV segundo diferenciais sócio-econômicos. *Cadernos de Saúde Pública, 16* (suppl. 1):113–28.

Szwarcwald, C.L., & Souza Jr., P.R.B. (2006). Estimativa da prevalência de HIV na população brasileira de 15 a 49 anos, 2004. Boletim Epidemiológico AIDS & DST 3(1):11–15.

Teixeira, P.R., Vitória, M.A., & Barcarolo, J. (2004). Antiretroviral treatment in resource-poor settings: The Brazilian experience. *AIDS, 18* (suppl. 3), S5–7.

Tess, B.H., Rodrigues, L.C., Newell, M.L., Dunn, D.T., & Lago, T.D. (1998). Breastfeeding, genetic, obstetric and other risk factors associated with mother-to-child transmission of HIV-1 in Sao Paulo State, Brazil. Sao Paulo Collaborative Study for Vertical Transmission of HIV-1. *AIDS, 12,* 513–20.

The World Bank. (1998a). Project Appraisal Document on a proposed loan in the amount of US$ 165 million equivalent to Brazil for a second AIDS and STD control project. Human and Social Development Group, Brazil Country Management Unit, Latin America and the Caribbean Region; July 31, 1998.

The World Bank. (1998b). Implementation Completion Report. Brazil. AIDS and STD Control Project (Loan 3659-BR). Brazil Country Management Unit, Human Development Sector Management Unit, Latin America and the Caribbean Regional Office; December 21, 1998.

Trevisol, F.S., & Silva, M.V. (2005). HIV frequency among female sex workers in Imbituba, Santa Catarina, Brazil. *The Brazilian Journal of Infectious Diseases, 9*, 500–5.

UNAIDS (The Joint United Nations Programme on HIV/AIDS) (2002). Monitoring the Declaration of Commitment on HIV/AIDS: Guidelines on Constructions of Core Indicators. Geneva (Switzerland).

UNAIDS (The Joint United Nations Programme on HIV/AIDS) (2005). Monitoring the Declaration of Commitment on HIV/AIDS: Guidelines on Constructions of Core Indicators. Geneva (Switzerland).

UNAIDS (The Joint United Nations Programme on HIV/AIDS) (2006). Report on the global AIDS epidemic. Available at http://www.unaids.org/en/HIV_data/2006GlobalReport/default.asp. Accessed January 2007.

UNCHR (United Nations Commission on Human Rights) (2001). Access to Medications in the Context of HIV/AIDS: Resolution 2001/33. New York: United Nations.

UNDP (United Nations Development Programme) (2005). Human Development Report. Available at http://hdr.undp.org/reports/global/2005/, accessed January 2007.

United Nations (2004). Millennium Indicators Database, Statistic Division. Available at http://millenniumindicators.un.org/unsd/mi/mi_goals.asp, accessed January 2007.

United Nations (2006). Radio news. Available at http://www.un.org/av/radio/ portuguese/print.asp?NewsID=903, accessed January 2007.

UNODC (United Nations Office on Drugs and Crime) (2006). World Drug Report. Volume 1: Analysis. Vienna: United Nations Office on Drugs and Crime.

Vaillancourt, D. (2004). Project Performance Assessment Report: Brazil First and Second AIDS and STD Control Projects. Washington DC: The World Bank.

Vocci, F.J., & Elkashef, A. (2005). Pharmacotherapy and other treatments for cocaine abuse and dependence. *Current Opinion in Psychiatry, 18*, 265–70.

WHA (World Health Assembly) (2001a). U.N. Commission on Human Rights: Access to Medication in the Context of Pandemics Such as HIV/AIDS. E/CN.4/RES/2001/33.

WHA (World Health Assembly) (2001b). World Health Assembly Resolution "WHO Medicines Strategy". WHA54.11.

WHA (World Health Assembly) (2003). Intellectual Property Rights, Innovation and Public Health. WHA56.27.

WHA (World Health Assembly) (2006). Public Health, Innovation, Essential Health Research and Intellectual Property Rights: Towards a Global Strategy and Plan of Action, World Health Assembly.

WHO (World Health Organization) (2006). Antiretroviral Therapy for HIV Infection in Adults and Adolescents in Resource-limited Settings: Recommendations for a Public Health Approach. Geneva, World Health Organization.

WTO (World Trade Organization) (1995). Agreement on Trade-Related Aspects of Intellectual Property Rights, World Trade Organization.

WTO (World Trade Organization) (2001). Declaration on the TRIPS Agreement and Public Health, World Trade Organization. WT/MIN(01)/DEC/2.