

An Overview of Brazil's HIV Epidemic: From Past Challenges to Future Directions

The HIV/AIDS epidemic has been a significant health challenge for Brazil. The first AIDS cases were identified in 1982 following shortly after the disease was identified in America [1]. AIDS was thought to primarily affect men who have sex with men (MSM) which resulted in significant stigma among this population [2]. Stigma became so prevalent in Brazil that, among the general population, “gay cancer” became the common way to refer to AIDS as it had in both US and global contexts [3, 4]. While the Brazilian response to the epidemic developed slowly, preventative programs began to increase in the late 1980's. Since then, the Brazilian response has been lauded as a model for epidemic control in developing countries [2].

During the emergence of HIV/AIDS, Brazil was experiencing a dramatic governmental shift from a decades-long dictatorship to a budding democracy [5]. The “sanitary reform movement” played a significant role in Brazil's human rights-based approach [2]. This reform group was comprised of individuals who called on the new government to implement a public health system that would prioritize health as a basic human right under the Brazilian Constitution [2]. This movement had particular force in the state of São Paulo, which led to the creation of the first government-run AIDS program in 1983 [2]. This program emphasized the distribution of condoms and lubricants in order to protect individuals while raising awareness of HIV and its modes of transmission [6]. In fact, Brazil became widely known as one of the largest purchasing entities of condoms in order to supplement its prevention programs [6, 7]. Shortly thereafter, Brazil's first non-governmental organization (NGO), Supporting Group for AIDS Prevention (GAPA), was founded in 1985 [8]. This organization was primarily concerned with disseminating prevention information, educating AIDS patients and families, and maintaining a

high level of political activism within the country that emphasized the rights of AIDS patients [9, 10]. GAPA also provided legal services for HIV+ individuals, such as lawsuits for discrimination and governmental failure to provide treatment when it became available [9].

Others took a more individualized approach to HIV/AIDS prevention in Brazil. For example, the “Save the Blood of the Brazilian People” campaign was launched in 1988 by Betinho, the first openly HIV+ president of the Brazilian Interdisciplinary AIDS Association [11, 12]. Betinho’s activism resulted in significant increases in public support which was critically important as little funding was dedicated to the epidemic at that time [12]. In addition to its various prevention programs, Brazil was a forerunner in providing treatment to its citizens.

In 1996, Brazil made the bold step of guaranteeing universal access to antiretroviral therapy (ART) for all HIV+ individuals [10]. Later that year, Brazil passed the Industrial Property Law which brought them into World Trade Organization (WTO) compliance by agreeing to honor international intellectual property rights [10]. This led to drastically increased prices for ART which made life-saving treatment inaccessible for thousands of HIV+ Brazilians [10]. In response, the Brazilian Health Minister José Serra threatened to overlook the American ART manufacturers and develop generic ART to meet the promise for universal coverage [10]. After several back-and-forth WTO suits between the US and Brazil and intense public criticism, several US drug companies agreed to slash their ART prices to provide access to Brazil [10].

According to UNAIDS data for 2016, the overall prevalence of HIV in Brazilian adults aged 15 to 49 was 0.6%, encompassing approximately 830,000 people living with HIV [13]. The 2016 HIV overall incidence rate was 24 new cases per 100,000 person-years at risk, which means there were approximately 50,000 new HIV cases in 2016 overall [13]. The populations

most affected by HIV include people who inject drugs (PWID), prisoners, sex workers, and men who have sex with men (MSM) [14]. MSM had the highest HIV prevalence rate at 10.5% while HIV prevalence in PWID and sex workers remained at 5.9% and 5.3% respectively [15, 16, 17]. Currently, there are no official estimates of HIV prevalence in prisoners nor incidence rates among key affected populations. The epidemic is considered to be stable at the national level due to the stability of HIV incidence at approximately 20 new cases per 100,000 person-years at risk between 2012 and 2014 [15]. Brazil's efforts to improve ART coverage and HIV prevention programs are largely responsible for this stabilization of the epidemic.

In 2016, approximately 60% of Brazilians living with HIV were receiving ART, and of this population, approximately 54% had suppressed viral loads [13]. In order to further curb the spread of HIV, Brazil has implemented several prevention strategies. For example, Brazil has emphasized the distribution of free condoms and lubricants, the accessibility of needles for PWID, and treatment as prevention (TasP) [18]. Expanding testing services is another top priority. In 2014 1,123 health professionals were trained to administer rapid HIV testing and counseling to cover 21 states and 30 municipalities in Brazil [18]. Lastly, there are significant efforts to stem the epidemic in key affected populations. One such example is the "Quero Fazer" program which translates to "I want to be tested." This initiative aims to test the MSM population in mobile clinics while getting them connected to treatment services as soon as possible [18]. Lastly, Brazil has made significant headway in supplying its citizens with PrEP, or pre-exposure prophylaxis. Recent and ongoing studies such as PrEPBrazil and Project Preparadas have specifically focused on disseminating PrEP and determining its efficacy in transgender women, a population that has historically received very little HIV research and

funding despite significantly elevated HIV prevalence rates [19]. The human rights-prevention approach Brazil has taken will be instrumental in preventing new HIV cases, while continuing to connect the most affected populations to testing and treatment.

In light of Brazil's demonstrated response to the opioid epidemic, there are still many challenges the country continues to face. For example, despite universal healthcare and several programs attempting to normalize HIV diagnoses, there is still significant discrimination against key populations in Brazil such as MSM and *travestis* sex workers, and truck drivers [20, 21, 22]. This prevents individuals from getting tested for HIV as well as seeking prevention and treatment. For example, among truck drivers near Brazil's southern border, those that reported lower levels of HIV stigma were significantly more likely to use voluntary counseling and testing services [22]. Another significant challenge to accurately and completely testing the Brazilian population is that people do not recognize their own risk of HIV. One study of over 2,000 postpartum women in Brazil found that higher levels of education, previous knowledge of HIV testing for prevention of mother-to-child transmission (PMTCT), and higher frequency of prenatal care visits were all significantly associated with increased levels of HIV testing during pregnancy [23]. When women were uneducated about HIV risk and prevention methods, testing levels significantly decreased. Despite Brazil's efforts to begin awareness/testing campaigns, individuals are still relatively uninformed about their own individual risk, and this inability to identify oneself as an at-risk group will make widespread testing interventions more difficult.

There are also several challenges Brazil faces in terms of preventing HIV. Despite widespread condom distribution, a 2016 study has shown that young Brazilians are not using condoms. Among 1,208 surveyed young people aged 18 to 29 years old, 42% did not know that

condoms could prevent pregnancy and STDs [24]. Even more concerning is the fact that the condoms being distributed in Brazil may not be safe or effective. One study evaluated 20 brands of male condoms that were commercially available in Rio de Janeiro between 2009 and 2011 [25]. A staggering 17 out of the 20 brands were noncompliant with the Brazilian National Health Oversight Agency's guidelines [25]. While Brazil has made great efforts to educate their population, condoms will not be effective if they are low quality and if individuals will not utilize them. In the future, Brazil will be challenged to adequately educate their youth about the proper use of condoms as well as ensure that both domestic and imported condom brands are meeting high quality standards in order to adequately prevent HIV.

Brazil has also been experiencing a significant recession in recent years which puts strain on its government, including the National AIDS Program [26]. It has yet to be seen how the recession will impact HIV prevalence, but with the ever-increasing costs of ART, it may be difficult for the government to ensure the universal ART access that was promised in the late 90's [10]. Moreover, Brazil still faces legal challenges regarding ART prevention and treatment access. Due to drug patent disputes, it was difficult to implement HIV treatment programs; Brazil now relies primarily on local ART production rather than using cheaper generic drugs produced elsewhere around the globe [10]. Some argue that this approach is more economically feasible in the long-term, but others dispute the potential effects on global drug development as generic drug versions de-incentivize ART production within drug companies [10, 27].

Brazil has undergone intense political upheaval in the past several years as well. Due to corruption and scandals among President Temer and Congress, many large protests have erupted in urban centers like São Paulo and Rio de Janeiro [28]. This political disorganization may

impede future prevention and treatment efforts in Brazil as powers and political parties shift and health priorities change. Finally, the Zika epidemic in Latin America has proved another significant health challenge for Brazil. During the 2016 Rio Olympics, there was widespread international fear of the virus which led to further economic strains and even a contentious letter to the World Health Organization asking for the postponement or transfer of the Olympics to a different location [29, 30]. The challenge of allocating scarce resources to a variety of health problems is not unique to Brazil, but it may lead to underfunding of HIV testing, prevention, and treatment which would negatively impact the progress Brazil has made in the HIV epidemic.

Despite the challenges facing Brazil, the country has still dedicated significant time and resources to continuing its HIV research in the past 5 years. For example, a recent study from 2015 investigated the correlates of depression in people recently diagnosed with HIV. This cross-sectional study took place over 2 years in Dourados, Mato Grosso do Sul, Brazil [31]. Fifty-nine recently diagnosed Brazilians over the age of 18 years old filled out validated surveys to measure socioeconomic status, quality of life, and depression [31]. Consultations with a physician and a psychologist were also included in the analysis to assess more direct health outcomes [31]. During the analysis of this study, the research team found that depressive symptoms were prevalent in 61% of the study sample and were significantly associated with lower income participants and those from a disadvantaged social class ($p=0.019$; $p=0.005$ respectively) [31]. This study also found that HIV+ participants who had lower quality of life scores were more likely to show depressive symptoms and to have both lower educational levels and incomes ($p<0.0001$; $p=0.05$; $p=0.03$ respectively) [31].

While this particular study does not focus on any key population in particular, it does draw attention to the intersections of HIV, stigma, and mental health in the general Brazilian population. This research suggests that “socioeconomic factors, including level of income and education, are mediating the risk of depression and poor quality of life” in people living with HIV [31]. HIV-related stigma is still widespread and prevalent in Brazilian society. Depression is thought to have disproportionate impacts on HIV+ individuals partly because they face this stigma on a daily basis and are less likely to have a strong social support network compared to their HIV- counterparts [32]. Prior research has demonstrated that depression negatively impacts ART adherence [33]. This poses drastic negative health consequences to HIV+ individuals such as lower CD4 counts, higher viral loads, and higher rates of transmission to HIV- sex partners.

There are many ways that Brazil could improve the current situation of the HIV epidemic. Stigma is still widespread in the country which leads to higher rates of depression and negative health outcomes in HIV+ populations. It is important to reduce stigma and investigate upstream causes of depression such as educational and income inequalities. Reducing stigma and providing adequate and accessible mental healthcare to people living with HIV are vital steps that must be taken in order to further slow and eventually eliminate HIV in Brazil altogether. The majority of anti-stigma and HIV testing campaigns have only been conducted in urban settings, so more effort should be focused on reaching key populations outside of Brazil’s largest cities.

It is also recommended that Brazilian government continues to dedicate significant funding towards HIV prevention research, specifically methods that could aid prevention efforts in Brazil’s key populations of PWID, sex workers, MSM, and prisoners. For example, the development of a vaginal microbicide that does not require partner consent or condom

negotiation would significantly protect commercial sex workers as well as women in the general population. In the interim, Brazil should mandate 100% condom policies for commercial sex workers to better protect the women employed at these establishments, much in the same model as Thailand's 100% condom policy which has been highly praised by the World Health Organization [34]. Brazil's local and federal governments should actively seek to collaborate with the international scientific community while developing its own culturally-tailored interventions to prevent the spread of HIV among its general and key populations.

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