

Natasha Knechtel
Stacy Readal
December 8, 2004

An Integrated Response to HIV/AIDS:
Managing and Strengthening Antiretroviral Rollout in Tanzania and Brazil

Introduction

In 2003, the World Health Organization announced the '3 by 5' Initiative, a plan to bring anti-retroviral treatment (ART) to 3 million HIV+ people in developing countries by 2005. The 3 by 5 Initiative has spurred the global response to the HIV epidemic and created a response plan that aligns the strategies of players including international institutions, national governments, donors, nonprofit organizations and the private sector. Current 2004 HIV/AIDS funding levels have reached an unprecedented 4 billion for the year in Africa alone.

In order to provide safe and effective ART and realize the goals of the 3 by 5 Initiative, sound management systems must be implemented in the developing world. An ultimate goal of any ART program should be the safe and effective long-term use of medications. Lifelong treatment demands strict adherence and sound management structures need to be created in all levels of the health care system. The organizations that provide prevention, diagnosis and treatment services must apply management techniques to planning, accounting and finance, operations, human resources and other support functions.

Even though there is a great need for management systems, little capacity-building is taking place in this sector. The need has become even more urgent of late because of the efforts to scale-up HIV/AIDS programs, the new emphasis on complex-to-manage antiretroviral treatment (ART), the donors' demands for greater transparency and accountability, and the increased decentralization of decision-making authority in the health systems of developing countries. The current efforts to build management capacity are localized and narrow in scope and little evidence exists to indicate that they are effective.

In this paper, we will examine the healthcare system and the distribution and management of ARV in two focus countries, Brazil and Tanzania. Brazil, which has a policy of 100% access to ARV, has long been viewed as a model of success in fighting the HIV/AIDS epidemic.¹ Lessons learned from Brazil are now being applied all over Latin America. Tanzania, which began distributing free ARV through the government in October 2004, has many barriers to overcome before it will be able to successfully deliver ARV to its HIV+ population.² However, given the strong support from both governmental and non-governmental organizations, Tanzania should be able to successfully implement a system to deliver ARV if it addresses key problems in drug management and distribution. The paper will end with a summary of what lessons from Brazil can be applied to Tanzania.

In this paper, we will examine only the national and local level weaknesses that hinder ARV rollout. We will assume that there is an adequate and available supply of ARV internationally and thus will provide little information on fluctuations in drug supply, changing patent regulations, and international law regarding ARV.

¹ *Brazil: World Bank Approves US\$100 Million for HIV/AIDS and STD Control*. Washington. June 27, 2003.

² *East African Community To Negotiate With Pharmaceutical Companies for Local Production of HIV/AIDS Drugs*. Xinhua News Agency, August 2004.

Global Overview: HIV/AIDS

Table 1: Summary of Global HIV/AIDS Data

Number of Adults and Children Living with HIV/AIDS (2004) ⁴	39,400,000
Total World Population (2004) ³	6,398,776,000
AIDS-related Deaths (2004) ⁴	3,100,000
New HIV Infections (2004) ⁴	4,900,000
PLWHA in low & middle income countries needing ART	6,000,000
PLWHA in low & middle income countries having access to ART	400,000
Bookmark not defined.	

Tanzania Situation Analysis

We have chosen Tanzania as a focus country because of the strong international, NGO and governmental support of HIV/AIDS initiatives. We believe that this support will allow for a more rapid rollout of ARV distribution initiatives and an easier adoption of lessons learned from other countries that have implemented successful antiretroviral rollout programs.

Table 2: Summary of Tanzania HIV/AIDS Data

Number of Adults and Children Living with HIV/AIDS (2002) ⁵	2,229,700
Total Population (2002) ⁶	36,588,222
Adult HIV Prevalence (2001)	7.8%
Number of AIDS Orphans (2001) ⁷	1,100,000
Life Expectancy without AIDS (2010) ⁸	56
Life Expectancy with AIDS (2010) ⁸	47
Annual cost of ARV ⁹	\$360
GDP per capita ⁶	\$478

Healthcare Overview and Responses to HIV/AIDS

Healthcare System Overview

Tanzania, population 36.6 million, is one of the most rural countries in the world with an urbanization rate of 33%.¹⁰ In some parts of Tanzania, a single hospital serves as many as 350,000 people. With approximately one doctor for every 20,000 inhabitants, health care is often seen as a luxury.¹¹ 4.4% of Tanzania's GDP is spent on health care, roughly \$26 per capita.¹² Approximately 60% of hospitals in Tanzania are for profit and 40% are government and hospitals and clinics are responsible for end of life care of many of the country's AIDS patients. Currently, hospitals return many AIDS patients to their homes to be cared for by family because they have a

³ PBS. World Population Counter. 2004.

⁴ Global AIDS Update, November, 2004. UNAIDS.

⁵ USAID. Bureau for Global Health. Country Profile: HIV/AIDS. Tanzania.

⁶ Central Intelligence Agency. World Factbook.

⁷ CDC National Center for HIV, STD, and TB Prevention. Global AIDS Program. Tanzania.

⁸ The World Bank.

⁹ *East African Community To Negotiate With Pharmaceutical Companies for Local Production of HIV/AIDS Drugs*. Xinhua News Agency, August 2004.

¹⁰ World Resources Institute.

¹¹ Engender Health.

¹² World Health Organization.

shortage of hospital and staff. It is estimated that Tanzania will have to triple the size of its current healthcare workforce in order to provide ART to all those who need it by 2015.²¹

Government Response to HIV/AIDS

The Government of Tanzania has developed a national response to AIDS based on a multisectoral strategy that encompasses not only the health sector, but also the education, social, economic and private sectors. This multisectoral approach to combating AIDS is coordinated by TACAIDS (Tanzania AIDS Commission) which was established in 2001. The National Multisectoral Strategic Framework on HIV/AIDS for 2003-2007 provides guidance for the planning and implementation of programs as well as frameworks for a monitoring and evaluation system and institutional and financial coordination.¹³

TACAIDS oversees the allocation and management of funding through the National HIV/AIDS Fund. Donors, private sector firms, and the government can contribute to this fund and monies are made available to national, regional, district and community-based programs. A separate fund exists for funds received from the Global Fund.¹³

In October, 2003, the Tanzanian government adopted a national care and prevention plan for HIV/AIDS. This plan aims to provide care for 1,200,000 AIDS patients over five years, 400,000 of whom are expected to receive ARV.¹⁴ In August, 2004, the Tanzanian Prime Minister Frederick Sumaye stated that at least 30,000 PLWHA in Tanzania would receive free ART by the end of 2005. The first supply of free ART was distributed in urban locations in October 2004. By 2006, Tanzania hopes to increase the number of HIV/AIDS patients who receive free ART to 220,000.¹⁵

Even though there has been increased funding and support for the rollout of ARV, it is imperative that the Tanzanian government find a way to sustainably provide lifelong treatment for PLWHA as drug adherence calls for 90-95% usage rates.¹⁷ It is likely that funding will diminish as donor fatigue begins to occur. As ARV drugs are currently out of reach for 90% of Tanzanians, the government and other institutions will have to provide drugs long-term if adherence is to occur.

International Support of PMTCT and ART Programs

International institutions and bilateral donors have been extremely supportive of Tanzania's HIV/AIDS initiatives. The Global Fund, the US President's Initiative and Emergency Fund, World Bank, GTZ of Germany, and the Clinton Foundation are all bringing new resources to Tanzania. Tanzania has been selected as one of the focus countries in PEPFAR (President's Emergency Plan for AIDS Relief, USA) which has brought in millions of dollars as well as logistical support from USAID-funded organizations. These organizations are providing financial and technical support for activities related to PMTCT and ART programs in the following areas: research, program management, service provision, and commodity procurement.

Tanzania is an attractive country for donors because of the political stability and widespread support of HIV/AIDS initiatives. It is expected that funding to Tanzania will continue to increase as the country demonstrates increased transparency and capacity to provide care for PLWHA.

¹³ United Republic of Tanzania MOH 2003.

¹⁴ The Clinton Foundation.

¹⁵ *East African Community To Negotiate With Pharmaceutical Companies for Local Production of HIV/AIDS Drugs*. Xinhua News Agency, August 2004.

Table 3: Sources and Amounts of ARV Funding

Source of Funding	2004 Amount	2005 Amount
World Bank TMAP ⁸	US \$70 million	
HIV/AIDS Care and Treatment Plan (Clinton Foundation) ¹⁴	US \$6.048 million	US \$17.3 million
Global Fund Round Three ¹⁶	US \$1.723 billion	

Nongovernmental and Faith-Based Response to HIV/AIDS

NGOs and FBOs provide possibly the most comprehensive approach to HIV/AIDS prevention and care. These organizations provide a continuum of care including prevention and education, behavior change communication, counseling and testing services, and home-based care. Although NGOs and FBOs may not be the most effective way to distribute ARVs due to funding, human capacity and logistics weaknesses, they are able to access the most marginalized populations due to their community-based approach to healthcare. NGOs and FBOs provide an important link in ARV rollout as they are the most able to follow up with patients in their homes to ensure drug adherence.

Although NGOs and FBOs often have the most access to PLWHA, they often rely on donations, making their supply of ARV unreliable. They also have limited purchasing capacity due to small budgets and reliance on outside donors for their operations.¹⁷ Another barrier that NGOs face is the little coordination between the government and in the NGO network. Services are often repeated and capacity is wasted due to poor coordination.

Private Sector Response to HIV/AIDS and ART Provision

ARV drugs are currently not covered by national insurance plans. Most initiatives that provide free medical care for PLWHA are employer-based and care is provided through company-operated clinics. Although laboratory facilities and quality assurance in most of these programs are adequate supply shortages are faced due to the lack of logistics management systems.¹⁷ Several major Tanzanian companies currently provide ART to their employees including Tanzania Breweries, The National Bank of Commerce, and Tanzania Railways Corporation.

Strengths and weaknesses related to ARV rollout

Although Tanzania has many strengths that will facilitate the rollout of ART, there are also many weaknesses that must be overcome before the country will be able to successfully provide ART to its PLWHA population. Below is a list of both strengths and weaknesses that Tanzania has that relate to the provision of ART.

Strengths

- The Tanzanian government has drafted guidelines that clearly describe the services and commodities that will be needed to expand the existing voluntary counseling and testing (VCT) services, PMTCT, and ART. This shows a clear willingness on the part of the government to provide drugs to its PLWHA population. The government has also recognized the importance of building a comprehensive program that includes VCT. Figure 1¹⁷ shows the continuum of care strategy in Tanzania.

¹⁶ The Global Fund.

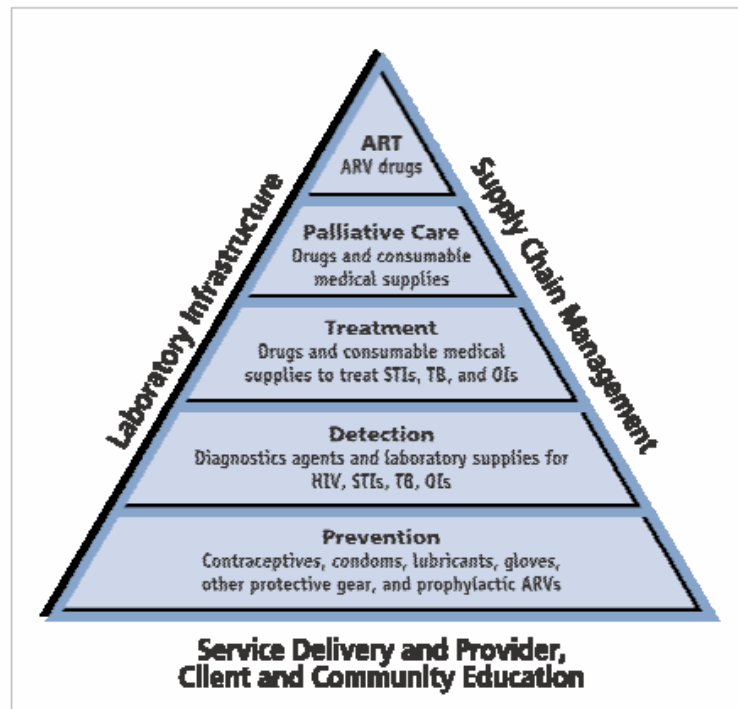
¹⁷ Tanzania: Logistics Systems Capacity and Site Readiness to Expand PMTCT and Initiate ART. John Snow International Deliver Program. 2003.

- The Ministry of Health also has a strategy in place for logistics management of essential health commodities. This strategy includes many PMTCT-related products. Although the strategy exists, many implementation breakdowns occur.
- All HIV/AIDS commodities, except ARV drugs, are being distributed and used through existing public sector programs. This should facilitate the implementation of ARV distribution through the public sector.

*Weaknesses*¹⁷

- Every level of the public health sector, including the MOH, lacks logistics management information systems. This inhibits accurate monitoring of stock balances, forecasting, and use of a FEFO (First to Expire First Out) distribution method.
- Formal procedures are not in place for ordering, storing and dispensing drugs throughout the health care delivery system.
- The organizational capacity in the MOH is weak. There is insufficient communication and coordination at the central level among different programs within the MOH. This limits the ability to effectively forecast, procure and manage drug commodities.
- At the facility level, supply and management of ARV drugs is not coordinated among laboratories, pharmacies and staff involved in the provision of drugs.
- Staff at the facility level is not adequately trained to provide ART services. Staff is paid low wages, works long hours, and is often also caring for PLWHA in their homes or communities. Staff lacks sufficient motivation to deal with the emotional strain of caring for PLWHA.
- Private providers and NGOs, although at a higher stage of readiness than MOH sites, are constrained by the unreliable supply and inefficient logistics systems in the public health system.
- Patient follow-up and home-based care systems are weak in most health facilities in Tanzania. If drug resistance is to be avoided, follow up care must be improved.
- Pilferage of ARV drugs is a significant problem. Because of their high value and life-saving qualities, measures must be taken to ensure security in storage and transport.
- Management of clinical patient records must be improved so that long-term care can be adequately provided.

Figure 1.
Commodities for a Comprehensive HIV/AIDS Program



Brazil Situation Analysis

The World Bank predicted that by the year 2000, there would be 1.2 million people in Brazil infected with HIV.¹⁸ Instead, the number today is closer to 660,000. Because of Brazil's early response to the epidemic and policy of universal access to ART, Brazil is cited as a success story in HIV prevention and care. Latin American and Portuguese Speaking African countries, in cooperation with the Brazilian government, are emulating the Brazilian model. As of September 2004, the Brazilian government, in partnership with the Joint UN Programme on HIV/AIDS is embarking on a new initiative to assist other developing countries in scaling up their operations.¹⁹

Table 2: HIV/AIDS Data for Brazil

Number of adults and children living with HIV/AIDS (2003) ²⁰	660,000
Total Population (2003) ²¹	178,400,000
Adult HIV Prevalence (2003) ²²	0.7%
HIV Prevalence in Urban Areas (2001) ²³	
High risk population (i.e. IDU, CSW, STI patients)	42.0%
Low risk population (those with no known risk factors)	1.2%
New Cases ²³	
Heterosexual transmission	55.0%
MSM	16.3%
IDU	12.1%

¹⁸ UNAIDS. Country Profile 2004.

¹⁹ UNAIDS. "Brazil and UNAIDS join forces in the global fight against AIDS." Sept. 2004

²⁰ UNAIDS. 2004

²¹ UNAIDS. Global Report on AIDS epidemic. 2004

²² UNAIDS. 2004

²³ CDC. National Center for HIV, STD, and TB Prevention: Global AIDS Program in Brazil.

Number of PLWHA on ART

135,000

The prevalence of AIDS, as well as mortality rates in Brazil have largely stabilized, however there has been a trend toward increased heterosexual transmission and a general pauperization process, which could nonetheless have adverse consequences in the future. Also, the percentage of infection of injecting drug users is comparatively low, but levels above 60% have been reported in some cities.

Healthcare Overview and Response to HIV/AIDS

Healthcare System Overview

The healthcare sector in Brazil is a mix of public and private services with 7,000 hospitals, 12,000 diagnostic clinics and 280,000 doctors. The Ministry of Health began decentralizing the health system in the mid 90s. Currently 90% of the municipalities have partial control over their healthcare systems, and 10% are fully autonomous.²⁴

Brazil began implementing The Family Health Program in 2000. The program aims to reform Brazil's public health services by establishing a primary care network as the main point of entry into the healthcare system. Currently, the program covers almost 60 million people. Most of the system's users are in rural areas and small towns because the program has not yet been expanded to large cities.

Even though Brazilian laws call for equity in healthcare, quality and access to health services varies greatly by region. Funds are not distributed equally across regions, and problems such as under funding and lack of priorities for the sector have contributed to overall deterioration in healthcare. For poor, marginalized groups, it is especially difficult to access health services. Service utilization rates vary greatly by type of service depending on income groups, socioeconomic position, and level of education.

Health Insurance

The Brazilian Constitution guarantees universal public health care for the population but also allows market segmentation and an expansion of private insurance coverage among wealthy people. Although the average coverage is 24%, only 7% of the families with the lowest income per capita had private health insurance, whereas the highest income per capita group has 83.2% coverage. Poor people in Brazil represent the largest part of the population and 76% percent of the Brazilian population does not have private health insurance coverage.²⁵

Response to HIV/AIDS

Government Response

The Brazilian government has given HIV/AIDS high priority since the first case was reported in 1983, and since then the response has benefited from strong political and financial support.²⁶ Since 1996, its AIDS policy has been to provide universal and free access to ART. At the time of its implementation, the policy was highly debated, nationally and internationally, by health experts, prevention and care program managers and staff responsible for budgetary and financial execution of public monies and international organizations.²⁷ Reports of treatment assessment and cost-benefit analysis were mixed.

²⁴ Healthcare and Medical Market in Brazil. UK Trade and Investment. 2004.

²⁵ World Bank Policy Research Paper. "The Potential Demand for an HIV/AIDS Vaccine in Brazil". December 2002

²⁶ *Brazil: World Bank Approves US\$100 Million for HIV/AIDS and STD Control*. Washington. June 27, 2003.

²⁷ www.aids.gov.br "National AIDS Drug Policy" 2001

Today, we know that the policy has resulted, not only in a 50% decline in mortality, but also a reduction of hospital admissions by over 80%, a fall of 60% to 80% in the need for treatment of opportunistic diseases, a 70% reduction in hospitalizations among HIV+ people, a reduction of the length and complexity of hospital admissions and a parallel significant increase in HIV+ people being treated on an outpatient basis. While costs associated with the universal access program from 1996 to 2002 amounted to US\$1.8 billion, the savings in hospital and ambulatory care are estimated at US\$2.2 billion.²⁸

In order to lower the cost of care²⁹, the strategy of the Brazilian health ministry was to increase outpatient service through the creation of 5 different care modalities to address HIV/AIDS patients. Since 1998, ambulatory treatment facilities have expanded five-fold, whereas day-hospitals have increased twofold.

Care Modality	Description	# Units
Outpatient Services	Take out-patients at clinical, diagnosis and therapeutic leveles. Activities include health promotion (counselling, palliative care and harm reduction)	381
Day Hospitals	Carry out diagnostic and therapeutic procedures of med/hi/complexity of up to 12 hours duration, in a hospital out-patient environment	79
Home Care Services	Provide integral and specialist care at home of the patient. Facilitate participation of family in the treatment, reducing need for hospital admission. Enable monitoring of less serious pathological complications.	53
Conventional Hospitals	Accredited by health ministry as reference hospital for high complexity admissions for HIV/AIDS. Function together with modalities above.	375
STD Care Services	Health units dealing with other STDs. Care given by professional staff trained in syndromic approach and disease prevention.	1126

Omitting STD care services, this yields 916 HIV/AIDS care facilities nationwide, with roughly even geographic facility/case ratio, except in the North, which has a disproportionately high number of facilities. Of concern, however, is the South, which has the country's highest incidence of new AIDS cases, and will therefore face an increased need for care services.

Geographic	# HIV/AIDS Care	Cumulative # AIDS	Facilities	Year 2000
------------	-----------------	-------------------	------------	-----------

²⁸ Brazil gov document

²⁹ A study of the direct costs of AIDS care in Brazil in 1996, carried out by the Foundation Institute of Economic Research _ FIPE, with the support of NAP, comparing the average costs per day of hospital stay, proved that the cost of conventional hospitalisation (US\$ 97.31) was twice that of Day Hospital admission (US\$ 47.02) and almost nine fold higher than Therapeutic Home Care (US\$ 11.31).

Region	Facilities		Cases (1980-2002)		per 1000 cases	AIDS Incidence / 100py
North	31	3%	4,340	2%	7%	4%
Northeast	99	11%	22,249	9%	4.5	5
Central West	55	6%	11,998	5%	4.6	9.8
Southeast	558	61%	159,965	67%	3.5	16.9
South	173	19%	39,028	16%	4.4	18.7
Brazil	916	100%	237,580	100%	3.9	12.4

NGO and FBO Response

NGOs have played a critical role in advocacy and policy development and have often provided the link between the government and vulnerable populations.³⁰ NGOs are also involved in activities such as prevention and education, behavioral change, PLWHA support, and institutional capacity building. NGOs in Brazil were also the first to implement home-based care programs. They are now actively involved in the provision of ART, **Error! Bookmark not defined.** and are increasingly important this area.³¹

Between 1998 and 2001, a total of 1681 projects were financed involving 686 NGOs, receiving financing amounting to \$30 million, from the national government as well as international donors. In addition to NGOs, universities and other academic institutions have been responsible for training staff in different areas of activity and undertaking relevant research.

The Ministry of Health contracts NGOs based on their capacity and planned activity as well as epidemiological needs. NGOs must adhere to strict procedures to spend and account for funds. The selection process is highly competitive and transparent. NGOs are monitored to ensure that workplan is equivalent to performance criteria. They are asked to submit technical/financial reports quarterly and subjected to site visits by Ministry of Health staff (visits are a mixture of oversight and technical assistance).³²

The relationship between Brazil's Catholic Church, the government, and NGOs also provides an interesting lesson. Despite conflicting principles between the church and the state, the country has 40 Catholic NGOs providing various AIDS-related services. Many in the Brazilian Catholic Church are involved in humanitarian aid as well as efforts to prevent stigmatization and discrimination because of AIDS. The Brazilian Bishops Conference has a national commission responsible for pastoral work in the area of AIDS and sexually transmitted diseases. The Brazilian Cardinal Paulo Evaristo Arns is recognized nationally and internationally for his work.

International Response

Brazil's HIV/AIDS programs have received international support from bilateral and multilateral institutions. Major external funding sources include the World Bank lending of 200 million and fund from UNAIDS, amounting to 750,000. USAID is the largest bilateral donor to Brazil, and institutions such as Family Health International, and AID for AIDS work on prevention and education, diagnosis and care, and greater access to ART.

³⁰ UNAIDS. Country Fact Sheet: Brazil.

³¹ Personal Communication with Sonia Miner.

³² Catherine Connor & Courtney Barnett. Public Sector Contracting of NGOs to Deliver HIV/AIDS Services: Case Studies from Brazil and Guatemala. XIII International AIDS Conference Durban, South Africa July 2000

Although the response to HIV/AIDS has been deemed a success, improved program management is necessary to reduce costs and provide better comprehensive care. International institutions should assist Brazil in expanding the coverage and quality of interventions, decentralizing the management and financing of program activities, establishing effective monitoring and evaluation capacity, and instituting management tools such as performance-based management.

The Private Sector

The private sector finances and implements prevention initiatives in the workplace for a total of 4.0 million workers. A number of NGOs pioneered the developing educational seminars and written information on HIV prevention to be conducted and distributed in the workplace. In 1998, the Ministry of Health created the National Enterprise Council of Corporations on HIV/AIDS. Approximately 24 large companies belong to the Council, including Volkswagen and MTV-Brasil. While companies provide prevention education, it remains the role of the government to pay for treatment.

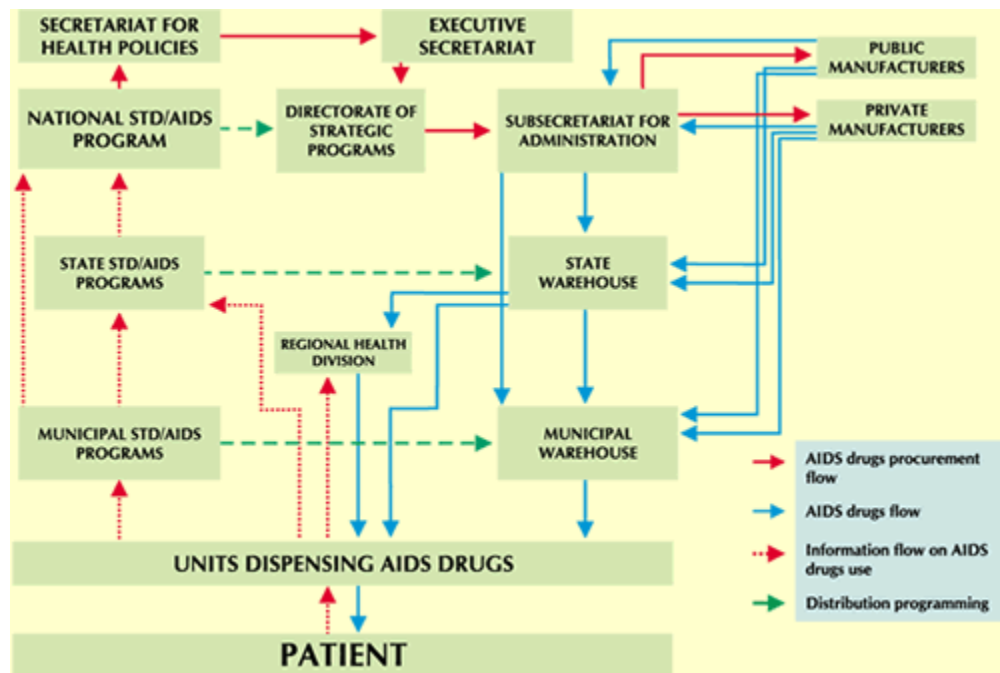
Strengths of the Brazilian ARV Delivery System

Logistics

Each state and municipality has its own strategic and operational plan, and there is broad cooperation among federal, state and municipal levels. While the Federal Government is responsible for ARV drugs, the procurement and distribution of drugs for treating opportunistic diseases is decentralized to the states and municipalities. AIDS drugs needs are estimated according to:

- Historical data on the number of adults and children on ART
- Historical data on the number and percentage of patients using each ARV drug and each therapeutic regimen
- New recommendations on ART

Following the chart below, the procurement flow, in brown, starts with the programming needs of the National STD/AIDS program. Green arrows demonstrate distribution programming; blue arrows, the different drug flows from delivery by the manufacturers to dispensation to the patient; and red arrows, the flow of information from the patient to NAP, including data essential for the distribution and procurement programming.



Drug procurement is usually carried out annually, and deliveries are usually divided in three to four consignments. Patients receive ARV drugs in the Units Dispensing AIDS Drugs, which usually are the pharmacies of HIV/AIDS outpatient services. To be eligible to receive treatment, the patient must be enrolled at the Dispensing Unit and be under the care of a physician from the National Health System. There are currently 424 such units throughout the country.

To address the capacity to train personnel in the diagnosis and treatment of HIV/AIDS, to strengthen public clinical laboratories, and to establish criteria for the administration of ARTs, independent advisory committees have aided the Brazilian National STD/AIDS program in elaborating and regularly updating recommendations and guidelines for treating patients. These guidelines are updated at least annually and disseminated on the National STD/AIDS program website.

Information System

The National AIDS program has developed a Computerized System for the Control of Drug Logistics (SICLOM). This system registers the distribution of ARVs, helping both to maintain needed stocks of the drugs at the Dispensing Unit and to ensure that ARVs are prescribed in accordance with national treatment and prescription guidelines to maximize efficacy and minimize toxicity. Characteristics include:

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

SICLOM has been implemented in the 111 largest Dispensing Units, which account for approximately 65% of patients on ARV therapy in Brazil.

Testing

Since the appropriate application of ARV therapy depends on critical patient data, the Brazilian MoH established, in 1997, a network of public laboratories where patients could receive CD4 and viral load tests free of charge. In 2001, 78 laboratories around the country were equipped to perform CD4/CD8 testing, and 66 laboratories were equipped to perform viral load testing. Eventually, the government aims to have 133 such facilities nationwide.

Internal Generics production capacity

It goes without saying that Brazil has a distinct advantage in the sense that a critical element to the Brazilian ARV distribution policy was the securing of low prices for ART through the local manufacture of generics, bulk purchases of imported ART, and price negotiations with pharmaceutical companies. Local production resulted in price reductions of over 80% and negotiations with multinational drug companies, who were exclusive producers of ARVs, resulted in a 60% reduction in price of three drugs. The Brazilian government produces eight of the 15 drugs used in antiretroviral therapy as generics, and buys the other seven from outside labs at below-market prices, thanks to agreements with the manufacturers. As a result, government expenditure was \$US 232 million to treat a total of 105,000, representing 1.6% of the Ministry of Health's budget. One could say, this is significant progress given that in 1999 it was at 3.18% (\$366 million for 73,000 patients), but at the same time an average of 15,000 new patients still need to be incorporated into the treatment system every year.

Adherence

Patient adherence to multiple doses therapeutic regimens is crucial to the clinical management of this disease, since non-adherence to antiretroviral treatment is directly linked to the development of viral resistance. Factors associated with non-adherence include the lack of education and low income, as well as the challenge of overcoming obstacles such as lifestyle adjustments and stigma.³³ Building a reliable relationship with the physician and health services is critical. The Brazilian health system has understood that the dialogue and negotiation ability of service providers is crucial. As a result, Brazil's the adherence rate³⁴ is around 60-70% and over the years has been roughly equal to rates seen in the developed world.³⁵

Comparative results of ARV therapy adherence studies

Site	N° patients	% compliance	Adherence rate
São Paulo/Brazil	1141	80	69
Baltimore/USA	202	80	60
London/UK	114	80	75
San Francisco/USA	388	80	78
Madrid/Spain	366	90	57,6

³³ A study carried out in São Paulo has shown that certain characteristics of users' groups are risk factors for non-adherence, particularly less than 4 years of schooling and lack of personal income.

³⁴ Adherence is defined as taking 80% or more of the total prescribed doses

³⁵ Global Policy Forum: Brazil: A Model Response to AIDS. Pascual Ortells. April 2003

Goals of the Brazilian Government

Current goals of the federal government's AIDS program include the continued:

- Roll-out of the treatment program
- Reduction in the costs of drug and supply acquisition
- Access to treatment of opportunistic infections
- Decentralization of the program through involvement of state and local governments and civil society
- Improvement in monitoring and evaluation of the program's accomplishments and shortcomings.
- Improvement of funding of the national health care system in general.

Specific disease reduction goals by the year 2006 include:

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

Specific incidence and prevalence goals for the year 2006 include the reducing prevalence of HIV among:

- Men 17-19 years of age.
- Women age 15-26 to 0.6%.
- IDU from 36.5% (2003) to 20%.
- CSW aged 20-24 from 6.1

Tanzania and Brazil Analysis

Similarities: Brazil and Tanzania

Brazil and Tanzania have many similarities regarding the demographics of the PLWHA population and country strategies for fighting HIV/AIDS. These similarities are listed below.

- AIDS affects poor, marginalized populations who cannot afford ART
- Both countries negotiate drug contracts with pharmaceutical companies
- National governments of both countries accept AIDS as a national health crisis
- Common behavior of multiple sexual partners among heterosexual populations
- Strong promotion of condom use and safe sex among government and nongovernmental agencies

Brazilian Strengths

Although there are many similarities between the two countries, Brazil has many strengths regarding HIV/AIDS policy that are not present in Tanzania. Brazil's strengths have been summarized below.³⁶

- National policy of ART for everyone
- Proximity to US pharmaceutical companies and ARV technology
- Manufacture generic drugs

³⁶ PBS NewsHour with Jim Lehrer. July 15, 2003.

- Nationwide computer system links clinics and pharmacies and monitors patients
- Acceptance of PLWHA and laws to protect rights
- Early acceptance of marginalized populations and NGO work
- Integrated government approach to AIDS including home-based care, primary and hospital care
- AIDS is approached as a health issue, not a religious issue

Lessons Learned: Applying Brazil's Model to Tanzania

Although there are many differences between Tanzania and Brazil, we believe that several aspects of the Brazilian model can be applied and modified for Tanzania. However, we do not expect that Brazil's policy of ART for everyone will be possible in Tanzania for several years given Tanzania's much higher prevalence and the rural location of many PLWHA. However, the Brazil strengths that can be applied to Tanzania to create the systems for eventual access for all are described below.

Patient Monitoring and Drug Tracking

In order for Tanzania's ARV distribution program to realize success, it will be necessary to implement a nation-wide patient monitoring system that will enable healthcare facilities and pharmacies to be able to communicate with national drug facilities. Without a system to track and prescribe ARV on a nation-wide basis, it will be impossible for Tanzania to monitor ARV in Tanzania. In order to implement a patient monitoring program like Brazil's, there would have to be a huge influx of money and technical support. Although the high-tech model of Brazil's patient monitoring is currently too advanced for the Tanzanian system, it is possible for Tanzania to implement a computer-based patient monitoring system if only urban health facilities are targeted.

We believe that due to patient monitoring constraints in rural areas, ARV rollout should initially occur in urban areas only. Urban health facilities have direct access to regional and municipal health offices, and are more technologically advanced than their rural partners. The highest prevalence of HIV/AIDS occurs in Tanzania's major cities, making an initial urban rollout more cost-effective than a nation-wide rollout including remote areas. Patient monitoring should include information on drug treatment history, instructions for storage and use of patient drugs and information on the primary care physician. The patient should also only be allowed to receive drugs at his designated ARV distribution center. This would provide for accurate forecasting of ARV and prevent stock outs in other distribution centers.

Logistics

Although Tanzania does not have access to locally produced generic drugs, we believe that the distribution of ARV should follow a similar distribution system to that of Brazil. All drugs should initially be passed through a national distribution center where they will be entered into the national database controlling supply of ARV. A 'First to Expire First Out' (FEFO) method of distributing drugs should be followed. After receiving regional forecasts, ARV should be shipped to a regional storing facility. Regional distribution centers will then distribute ARV to patient distribution centers. These patient centers will follow a strict timeline and a standardized format for requesting ARV. Forecasting will follow the Brazilian model and will be based on historical data regarding patient numbers and monthly increases. Forecasting will also use historical information on drug regimens included in the national patient monitoring system to predict future use.

Levels of Patient Care

In order to guarantee the high adherence levels that are present in Brazil, a multi-tiered approach to patient care must be implemented in Tanzania. Different players providing different levels of

care to PLWHA should be coordinated so that the patient accesses the appropriate facility when seeking services. The different levels of patient care are listed below.

Conventional Hospitals: Conventional hospitals should be used only for patients with complex health problems that cannot be treated at outpatient facilities. Conventional hospitals will have access to patient information via the national patient monitoring information system and the patient's primary health clinic.

Outpatient Services/Primary Health Clinic: This level should represent the patient's primary health physician. The patient should schedule follow up visits with the physician on this level and should visit the clinic for minor health problems. This level will communicate with home care providers that will be responsible for patient monitoring and adherence testing.

Home Care Services: Often provided by NGOs, home care services provide the critical link between the primary care physician and the patient. Home care services follow up on the patient in their homes regularly to ensure that high levels of drug adherence are being followed. The home care provider also provides information to the patient and their families about prevention and care. Although home care services exist in Tanzania, they should be strengthened and partnered with other institutions in the health care industry. The home care organization should communicate with primary care clinics to receive updates and drug regimens and care techniques. The home care provider should also report on drug side effects and effectiveness in their patients.

Generic Drugs

Although many pharmaceuticals have drastically reduced the cost of AIDS drugs, it is essential that Tanzania have more stable access to cheap source of generic drugs. Tanzania currently receives most of its generic drugs from Cipla, an Indian pharmaceutical company. Due to new patent regulations in 2005, Cipla may lose its license to export generics to developing countries.

Like Brazil did in the early 1990s, Tanzania needs to secure several sources of drugs, including developing its own drug-making capacity. Great potential exists to create generic drugs in the East Africa region including Kenya, Tanzania and Uganda. Due to common laws, mutual interest and close proximity, generic drugs could be manufactured in one plant for the entire region.

Big player drug negotiating firms like the Clinton Foundation should continue to work with the Government of Tanzania to reduce drug prices and barriers. They have made significant progress in increasing access to life-prolonging drugs and their work should continue throughout the region.

Reducing Stigma

In general, Tanzania needs to be more accepting of its PLWHA in order to reduce stigma. Stigma is a huge barrier for those who need care but do not want to access services. In order for significant prevalence declines to occur, Tanzanian organizations need to embrace PLWHA and provide support for them. Support programs include jobs training programs, home care, and legal support in discrimination cases. Brazil's openness and acceptance of HIV/AIDS and its victims led to an early victory in the fight against AIDS. Because of its early action and strong coordination among HIV/AIDS organizations and service providers, Brazil was able to undercut year 2000 prevalence projections by 600,000 people. Tanzania should follow a similar model of integrating the government, international, health, private and nongovernmental players in the fight against AIDS. Only then will an ART rollout be successful which will help the country move beyond the era of AIDS.

Conclusion

If Tanzania follows the above recommendations, it will be in a much stronger position to deliver an effective antiretroviral therapy program. Due to the extensive amount of money being distributed to Tanzania's HIV/AIDS programs as well as the technical and managerial support being offered to institutions, we believe it is possible to make the necessary HIV/AIDS infrastructure and personnel improvements. By investing in infrastructure improvement and increased coordination now, Tanzania will be able to save money in the long run by reducing hospital and emergency care services. Tanzania's economy will also benefit as more people are able to remain in the workforce producing for Tanzania.

The Brazilian model, although applied in very different circumstances in a different part of the world, has many aspects that can be applied anywhere. It is important that countries and international institutions learn from the experiences of Brazil and apply best practices in areas affected by HIV/AIDS.