

Nigeria: Rapid Assessment of HIV/AIDS Care in the Public and Private Sectors

August 2004

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Abstract

This assessment report documents the Nigerian experience in HIV/AIDS treatment in both the public and private sectors. Nigeria accounts for approximately 20 percent of West Africa's population and is ranked fourth in the world in total number of reported AIDS cases. The impact of the epidemic on the social and economic development of Nigeria has been substantial. HIV/AIDS has contributed to the decrease in life expectancy, increase in the number of deaths in young adults, and increase in the number of orphans in the country. Since 1999, the Nigerian government has placed high priority on HIV/AIDS prevention, treatment, care, and support activities, supported by significant donor efforts for AIDS prevention and control. This assessment was commissioned by United States Agency for International Development (USAID)/Nigeria to gain an in-depth understanding of the current status, challenges, and cost of providing HIV/AIDS services in the public and private sectors in Nigeria. It was a joint undertaking of USAID, the Federal Ministry of Health, and the National Institute of Medical Research.

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral Drugs
ATC	AIDSTREATCOST
FCMS	Federal Central Medical Stores
FCT	Federal Capital Territory
FMOH	Federal Ministry of Health
FTE	Full-time Equivalent
HAART	Highly Active Antiretroviral Therapy
HATISS	Harmonized National Salary Scale
HEAP	HIV Emergency Action Plan
HIV	Human Immunodeficiency Virus
JSI	John Snow, Inc.
JUTH	Jos University Teaching Hospital
LUTH	Lagos University Teaching Hospital
NACA	National Action Committee on AIDS
NAFDAC	National Agency for Food and Drug Administration and Control
NASCP	National AIDS/STD Control Programme
NGO	Nongovernmental Organization
NIMR	National Institute of Medical Research
NIPRD	National Institute of Pharmaceutical Research and Development
PCR	Polymerized Chain Reaction
PHR<i>plus</i>	Partners for Health Reform <i>plus</i>
PLWHA	People Living with HIV/AIDS
PMTCT	Prevention of Mother-to-Child Transmission
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
UNAIDS	Joint U.N. Program on AIDS
USAID	United States Agency for International Development

VCT Voluntary Counseling and Testing
WHO World Health Organization

Currency Conversion:

Naira (₦) 140 = US\$ 1.00

Foreword

The Acquired Immunodeficiency Syndrome (AIDS) which is caused by the Human Immunodeficiency Virus (HIV) is arguably the greatest health problem of this age. Since the first cases were diagnosed in the USA in 1981, the disease has spread so dramatically that cases have now been reported in all countries of the world. At the end of 2003, it was estimated that over 40 million people are living with the virus globally. Over 75% of these cases are in sub-Saharan Africa.

Contemporary reports have indicated that while the epidemic has been slowed down in most developed and a few developing countries, the epidemic is still in the exponential phase in several developing countries. In these countries, new cases of infection are still emerging. The cumulative impact is that the pool of people infected with the virus has continued to increase globally with its attendant morbidity and mortality.

This situation has made it imperative for countries to evolve and strengthen strategies for care and support of people living with the virus. The development of Antiretroviral drugs (ARVs) cast a big ray of hope in the clinical management of HIV/AIDS. The ARVs are drugs which do not really cure the disease but when used in proper combinations can reduce the replication of the virus and restoration of the Immune System in the infected individual. The optimal combination of ARVs which is known as HAART (Highly Active Antiretroviral Therapy) has significantly reduced morbidity and mortality in people living with the virus. The beneficial attributes of HAART have encouraged several developed and developing countries to adopt its use.

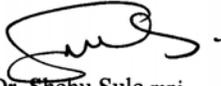
In 2001, the Federal Government of Nigeria initiated the National Antiretroviral Programme. Under this programme, 10,000 adults and 5,000 children are to be treated in 25 centres across the country. Since the initiation of the National Programme other ARV Programmes have also been initiated in the country by some State Governments, NGOs, Faith-Based Organisations and Private Sector Establishments. Provision of drugs is just the starting point of any ARV programme. Effective implementation of any ARV programme requires other logistic factors in addition to the availability of drugs. Adequate structures must be put in place for a sustainable supply of the drugs, adequate storage, effective distribution and well as periodic monitoring and evaluation of the programmes.

Monitoring and evaluation of this programme is crucial as that is the only tool to assess the programmes periodically and measure their outputs. Unfortunately, since the National and other ARV programmes commenced in the country, there has been no concerted effort on a national level to assess these programmes. The study reported in this document is thus the first well organised effort to assess the various ARV programmes as currently being implemented by the various public and private sector establishments. The coverage of the study was broad as it assessed 15 public sector, 34 private sector, 12 faith-based and 4 NGO implementing centres in eight States across the country. The study focussed on assessing drug procurement, drug supply, drug delivery and drug management systems as well as assessing the overall programme management, overall cost of providing HAART, community involvement and available human resources for the programmes.

The data generated were quite interesting and revealing. The overall finding highlighted the strengths and weaknesses of most of the present programmes. Obviously, this document will guide

policy makers and implementers on how best to strengthen and sustain effective ARV programmes in Nigeria. The efforts of the DELIVER, PHR*plus*, and POLICY projects, Federal Ministry of Health and the Nigerian Institute of Medical research in the preparation of this document are highly commended.

The document is therefore recommended to all stakeholders in the area of ARVs in Nigeria.



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As of the end of 2003, more than 40 million people worldwide had been infected with the Human Immune Deficiency Virus (HIV). Approximately 90% of the people living with HIV/AIDS globally, were in low or middle income countries where the annual per capita public expenditure on health consists of very few dollars. Health care provision is often limited by weaknesses in the capacity and distribution of public health infrastructure, including outpatient and inpatient facilities, trained health workers and drug distribution systems. With so many living with and dying of HIV, the challenges in these settings was to develop immediate yet sustainable responses, both within and outside the health systems, that can meet the wide range of medical, psychological and social needs of persons living with HIV or AIDS.

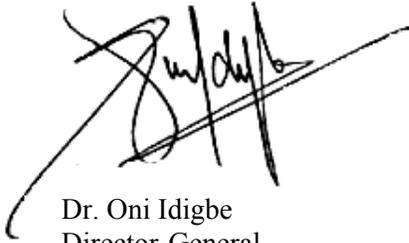
With the lowering of the prices of branded antiretroviral drugs and the introduction of generic copies, some developing countries have been able to initiate national antiretroviral programmes at relatively small scale levels. The goals of the ARV therapy are to provide the optimal and individualized treatment for persons infected with HIV at all stages of the disease. Presently, twenty-two antiretroviral drugs are available globally and these fall into three main classes. The use of a combination of three antiretroviral agents from two drug classes has been termed “Highly Active Antiretroviral Therapy (HAART). This therapy has been associated with sustained suppression of plasma viral load and significant improvement in the immune status of the patient. These results have translated into a proven increase in survival, reduced morbidity, decreased vertical and sexual transmission, as well as prevention of infection following inadvertent exposure.

While the outcomes of HAART are dramatic, the desired results are achieved only when the ARVs programme is properly implemented. In addition to the availability of the drugs, there are other very important determinants that influence the effective implementation of ARV programmes. These include such factors as the modalities of drug procurement, drug storage, drug delivery, overall cost of providing the programme, human resource available for the programme, availability of other complementary social and clinical services, the general management of the programme and the level of PLWHA and community involvement. Where these programme components are not well articulated and coordinated implementation will not be effective and the resultant effect will be a significant rate of ARV treatment failure. Under this situation, drug resistant strains of HIV will emerge with devastating potentials to country and global responses to the epidemic. The development and spread of resistant HIV due to ARV treatment failure is not only likely to render the currently available ARVs ineffective but could trigger a second global epidemic of resistant HIV. Added to the already existing problem of the disease, this will undoubtedly further strangle the socio-economic development of most countries. This is why periodic monitoring and evaluation of ARV programs in all countries has become an imperative.

In 2002, the Federal Government of Nigeria initiated a National Antiretroviral programme which was targeted at treating 10,000 infected adults and 5,000 children in 25 treatment centres across the country. The slots provided under this programme are so minimal compared to the estimated 3.5–4 million people with the virus and approximately 1.5 million needing ARV treatment. The provision of ARV treatment by State Governments NGOs, Faith Based establishments and private sector organisations complements the efforts of the Federal Government. Thus in addition to the National Programme several other ARV programmes are running in parallel in the country. However, there has never been any national assessment nor monitoring and evaluation of the various programmes and their components to ascertain if the programmes are being properly prosecuted to ensure the desired results are being achieved.

The first ever national assessment and evaluation of these programmes was jointly carried out by the DELIVER, POLICY, and PHR*plus* projects, the FMOH and the Nigerian Institute of Medical Research, Yaba Lagos. The project assessed and evaluated the ARV programmes in 15 public, 34 private, 12 faith-based and 4 NGO ARV implementing centres across the eight States of the country.

The contents of this report are the findings and recommendations of this national survey. They are hereby recommended to all especially the health policy makers, implementers and other major stakeholders in the area of care and support of the people living with the virus including antiretroviral treatment. You will find it a very resourceful document.

A handwritten signature in black ink, appearing to read 'Oni Idigbe', with a long horizontal stroke extending to the right.

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The execution of the assessment was made possible because of the valuable support provided by Dr. Edugie Abebe, Director of Public Health in the Ministry of Health; Dr. Salawu, Head of the National AIDS/STD Control Program; Drs. Chukwuemeka Asadu, Nasir Sani Gwarzo, and Levi Uzono of the Federal Ministry of Health; and Prof. John Idoko of Jos University Teaching Hospital. In addition, physicians and other focal persons responsible for the antiretroviral treatment programs at the following institutions provided valuable information without which the study would not have been possible: (a) Anambra State Hospital; (b) Aminu Kano Teaching Hospital; (c) Central Bank of Nigeria Clinic; (d) Gwagwalada Specialist Hospital; (e) Lagos University Teaching Hospital, (f) National Hospital; (g) National Institute of Pharmaceutical Research and Development; (h) Niger Hospital; (j) Nigerian Army Reference Army Hospital; (k) Nigerian National Petroleum Corporation Clinic; (l) Ring Road Hospital, Ibadan; (m) State House Clinic; (n) State Security Services Clinic; (p) University College, Ibadan. Staff of the following institutions also provided valuable information and assistance: National and State Action Committees on AIDS, the Federal Central Medical Stores, and Ranbaxy, Nigeria. A full list of persons interviewed can be found in Annex A.

The authors would also like to thank the members of the assessment teams for their contributions to the study. Finally, the authors wish to acknowledge the indispensable support of Ms. Shelagh O'Rourke and Dr. Temitayo Odusote of USAID/Nigeria.

Executive Summary

Nigeria is the most populous country in Africa and accounts for approximately 20 percent of West Africa's population. In 2002, the country was ranked fourth in the world in total number of reported AIDS cases. By 2002, cumulative AIDS-related deaths had reached 1.4 million, with 200,000 AIDS deaths in 2002 alone. According to the Federal Ministry of Health, the disease is one of the leading causes of death in adults aged 15-49 and has been reported in nearly all states. The epidemic is generalized, affecting men and women, and urban and rural areas with almost equal intensity (UNAIDS 2002). The impact of the epidemic on the social and economic development of Nigeria has been substantial. HIV/AIDS has contributed to the decrease in life expectancy, increase in the number of deaths in young adults, and increase in the number of orphans in the country.

Nigeria's large population is served by a variety of both public and private health facilities. However, the majority of HIV/AIDS services are provided in the public sector, which commands the majority of Nigeria's resources and qualified staff. Since 1999, the Nigerian government has placed high priority on HIV/AIDS prevention, treatment, care, and support activities, bolstered by significant donor support for AIDS prevention and control. In recognition of the need to implement a multisectoral response involving all sectors of government and civil society, the federal government established key institutions including the President's Committee on AIDS, the National Action Committee on AIDS, and state action committees on AIDS.

In April 2001, the government announced its decision to invest N500 million (about \$3.7 million) annually for the procurement of antiretroviral (ARV) drugs. In December 2001, a plan of action for broad access to ARV drugs in Nigeria was developed. In January 2002, the Ministry of Health initiated the National ARV Therapy (ART) program with the distribution of ARV drugs to 25 designated centers in the country. Currently, there are 13,043 people living with HIV/AIDS on the government ART program.

This assessment was commissioned by the United States Agency for International Development (USAID)/Nigeria Mission to gain an in-depth understanding of the current status, challenges, and cost of providing HIV/AIDS services under the federal government program and in the private sector (corporations, private clinics, faith-based initiatives, and nongovernmental organizations) in Nigeria. It was a joint undertaking by USAID, the Federal Ministry of Health and the National Institute of Medical Research. Both public and private sector facilities were selected for assessment based on their status of providing ART, voluntary counseling and testing (VCT), or prevention of mother-to-child transmission services.

Several key findings can be drawn from this assessment. First, current ART capacity falls far short of the number of patients requiring treatment. Over-enrollment of patients, budgetary shortfalls, and delays in budget release are common, often resulting in ARV drug shortages. Budgetary inconsistencies and the absence of centralized inventory control and distribution systems prevent drug supply companies and treatment facilities from making informed forecasting decisions, leading to increased drug procurement cost.

Second, public sector facilities providing ART services experience severe budgetary constraints, limiting their ability to provide adequate HIV services. Existing staff are overstretched and most have insufficient training in key technical areas (counseling, nutrition, and social services) to provide complete HIV services, which include VCT, patient education, adherence support, patient monitoring, legal counseling, and other care and social support services. Inadequate systems for the collection, aggregation, and analysis of patient data have resulted in inadequate program level monitoring, evaluation, and decision making. As a result, there is little information available to inform program level decision making.

Third, while most public sector facilities are aware of national policies, guidelines, and protocols on HIV/AIDS service delivery and follow some of the general guidelines and protocols, these documents are rarely available for reference. Centers do not have the necessary technical guidance and support to establish comprehensive ART programs, resulting in the lack of essential components of ART. Few centers have developed meaningful partnerships with community groups, although such groups have been key advocates of improved federal government HIV service provision. The public sector laboratory facilities are generally capable of conducting a full range of HIV-related tests, though patients are rarely able to afford the tests. Facilities are responsible for the management of laboratory supplies and generally operate drug revolving funds at full cost to the patient. The annual, per-patient cost of ART services is estimated at \$913, with staff salaries, ARV drugs, and monitoring tests representing the largest components. The bulk of the burden (over 60 percent) falls on the federal government, but the patient burden (up to \$324 per year) is enormous and affordable to only a small proportion of Nigerians. Fourth, private sector HIV service provision is limited largely because only few patients can afford private sector ARV drugs. Most patients are referred to public sector facilities for treatment. In fact, many private sector facilities are concerned about the long-term sustainability of these programs. National guidelines on ART treatment are rarely accessible in the private sector and few private facilities have developed their own guidelines for clinical management and other aspects of HIV care and support services. Laboratory monitoring tests are rarely conducted and community outreach activities are generally considered outside the mandate of private sector facilities. The cost of HIV service provision in the private sector is \$2,263, more than double that of the public sector, due to the high cost of ARV drugs in the private sector. Costs of staff salaries, staff training, and monitoring tests, however, were lower in the private sector, possibly confirming anecdotal evidence of lower levels of service quality.

Finally, the majority of private sector facilities do not receive any form of support from the government and there are no formal linkages between private and the public sector ART programs, despite the fact that many private sector facilities expressed the desire for greater collaboration between the public and private sector.

In order to scale up the HIV/AIDS response in Nigeria, the authors suggest the following recommendations:

1. **Optimizing HIV/AIDS service delivery.** Dividing ART services among providers (primary, secondary, and tertiary institutions) best positioned to provide them.
2. **Improving ART program management and financing.** Engaging the main stakeholders to develop a strategic framework to prioritize programming areas, define resource requirements, ensure financial sustainability, and set program performance measurement.
3. **Updating, finalizing, and disseminating national guidelines.**
4. **Ensuring a flexible, long-term procurement mechanism.** Establishing long-term contracts

for ARV drug procurement, allowing the manufacturer to develop long-term production and distribution plans.

5. **Establishing an efficient, reliable, and secure ARV drug distribution system.** Implementing a nationwide ARV distribution system that monitors ARV consumption and assures routine resupply of drugs.
6. **Reducing patient out-of-pocket expenditure on laboratory tests.** Re-evaluating monitoring protocols and instituting subsidy programs for screening, confirmation, and monitoring tests.
7. **Strengthening the ART program in preparation for expansion.** Improving essential program management and capacity-building structures and budgetary allocations before implementing plans to scale up the program.

1. Background

1.1 The HIV/AIDS Situation

Nigeria is the most populous country in Africa and accounts for approximately 20 percent of West Africa's population. In 2002, the country was ranked fourth worst affected by HIV/AIDS in the world based on the total number of cases reported (Population Reference Bureau 2002). According to the Federal Ministry of Health (FMOH), the disease is one of the leading causes of death in adults aged 15-49 and has been reported in nearly all states (FMOH 2002). The epidemic is generalized, affecting men and women, and urban and rural areas with almost equal intensity (UNAIDS 2002). Recent estimates from a sentinel survey indicate that adult HIV prevalence rates have increased steadily from 1.8 percent of the population in 1991 to over 6 percent a decade later, with infection rates in some parts of the country as high as 16 percent. Estimates from 2002 indicate that the number of adults and children living with HIV/AIDS has risen to 3.5 million, with 1,700,000 women of reproductive age (15-49) and 270,000 children (World Health Organization 2004). The most affected demographic group is youths aged 20-24 years with a prevalence rate of 6.5 percent. The 1999 FMOH HIV/Syphilis sentinel sero-prevalence study showed that the principal method of transmission was heterosexual contact (80 percent), followed by 10 percent due to blood transfusion, and the rest due to other routes of transmission.

The impact of the epidemic on the social and economic development of Nigeria has been substantial. HIV/AIDS has contributed to the decrease in life expectancy, increase in the number of deaths in young adults, and increase in the number of orphans in the country. As of 2002, the estimated number of orphans had reached 847,000 and cumulative AIDS-related deaths had reached 1.4 million, with 200,000 deaths in 2002 alone (POLICY Project 2002).

Nigeria's large population is served by a variety of both public and private health facilities. Several reports have indicated that access to health care varies tremendously by socioeconomic status, level of education, employment and geographic location. Despite generally poor levels of rural health care services, a small, privileged group of people, primarily in urban areas, have access to high quality health care. Private health institutions include a network of private-for-profit entities, nongovernmental organizations (NGOs), and faith-based organizations that provide health care to millions of Nigerians (FMOH 2002). Some private sector institutions have formed coalitions to respond to the HIV/AIDS epidemic, such as a coalition of faith-based organizations and the Nigerian Business Coalition against HIV/AIDS, formed in January 2003 to respond to the need for workplace HIV prevention and care initiatives.

1.2 National Response to HIV/AIDS

The first case of AIDS was reported in 1986 and since then there has been a rapid increase in the total number of people living with HIV/AIDS. According to the FMOH, HIV/AIDS control was neglected and fragmented under previous governments. Since 1999, the new government has placed high priority on prevention, treatment, care, and support activities. AIDS prevention and control

activities have received a high level of political commitment and donor support. In recognition of the need to scale up a multisectoral response from all sectors of government and civil society, the federal government established key institutions including the President's Committee on AIDS and the National Action Committee on AIDS (NACA). One of NACA's primary responsibilities is the execution and implementation of activities under the HIV/AIDS Emergency Action Plan (HEAP), introduced in 1996 as a bridge to a long-term strategic plan.

Under the financial and organizational leadership of NACA, HEAP focuses on two main components: (a) creating an enabling environment through the removal of socio-cultural, informational, and strategic barriers and catalyzing community-based responses; (b) HIV/AIDS-specific interventions such as preventive interventions for the general population and targeted to high-risk populations and care and support for persons infected by HIV/AIDS. With rising HIV prevalence rates and AIDS-related deaths, the lessons learned from the implementation of HEAP suggested that a review of the national policy on HIV/AIDS was seen as a necessary step forward. Therefore, to help limit the spread of HIV/AIDS in the country, in 1997 the government of Nigeria developed the National Policy on HIV/AIDS and Sexually Transmitted Diseases (STIs), which represented a new approach based on the involvement of all sectors of society in the planning, implementation, and evaluation of the country's response.

The health sector's response to the epidemic is managed by the National AIDS and Sexually Transmitted Disease (STD) Control Program (NASCP) of the FMOH's Department of Public Health. NASCP is responsible for three primary activities related to the health sector response to HIV/AIDS:

First, NASCP is responsible for formulating and disseminating national health sector HIV/AIDS policies and guidelines, informed by a series of nationwide stakeholder meetings involving representatives of state AIDS control programs, HIV/AIDS service delivery providers, and other federal government bodies. Second, NASCP provides training and technical support to state and local government AIDS control programs, health care facilities, and development partners.

NASCP's third responsibility with respect to HIV/AIDS is facilitating the procurement of antiretroviral (ARV) drugs for the government's "plan of action for broad access to anti-retroviral drugs." The plan was initiated in December 2001 with an April 2001 annual budgetary allocation of ₦500 million (about \$3.7 million).¹ In January 2002, the FMOH formally initiated the National ARV Therapy (ART) Program with the distribution of ARV drugs to the 25 designated centers in the country (see Figure 1, a map of Nigeria, in Section 2). Initially, each center received an approved quota of 25 treatment slots, a total of 625 patients nationwide, each for 12 initial months of therapy. The plan of action also called for a scale-up of ART services to between 5,000 and 10,000 patients by 2003. Currently, 13,043 people living with HIV/AIDS (PLWHA) are in the government ART program (FMOH February 2003).

1.3 National HIV/AIDS Policies and Guidelines

In August 2003, the 1997 National Policy on HIV/AIDS and STIs was reviewed and launched with the overall goal of controlling the spread of HIV/AIDS in Nigeria and expanding the scope of the interventions beyond public health, such that all Nigerians will be able to achieve socially and economically productive lives. To achieve this goal, the government of Nigeria made several commitments, which include a multidisciplinary response, empowerment of the people, and improved

¹ Interview with head of Ranbaxy, Nigeria, February 2004

access to health, research, and monitoring. The policy highlights five major strategies: (a) prevention of HIV/AIDS transmission; (b) respect for and protection of human rights of all people living with or affected by HIV/AIDS; (c) care and support for those affected and infected; (d) effective communication; and (e) effective program development and management.

Following the development of the national HIV/AIDS policy, the FMOH drafted guidelines on the provision of ART, voluntary counseling and testing (VCT), and prevention of mother-to-child transmission (PMTCT). The ART guidelines are based on World Health Organization (WHO) guidelines and indicate the following first-line regimen: (i) Indinavir or Nelfinavir, Saquinavir or Ritonavir; (ii) Ritonavir + Lopinavir; and (iii) Efavirenz+2 NRTIs. No second line regimen is specified in the guidelines, though a guide is included on selecting drugs in cases of toxicity to the first-line regimen.

Guidelines for VCT services underline the importance of community involvement and the need for coordination at the state and local levels. Counseling is incorporated into existing health and social services and testing should always be offered on a voluntary basis. In addition, the guidelines state that a national system for collecting and analyzing data has been developed by the FMOH and should be in use at all VCT sites, including government and mission hospitals and health centers, NGOs, PLWHA organizations, and private clinics (FMOH May 2002). However, these guidelines are not widely disseminated, and there is little compliance with their reporting requirements.

National guidelines on PMTCT indicate that women who are identified as HIV positive during pregnancy should have a full clinical examination, syphilis testing, hemoglobin estimation and urinalysis and, if resources permit, full blood count, screening for STIs, CD4 count, and quantitative viral load tests (for HIV-positive women). HIV-positive women should be treated for opportunistic infections and counseled on lifestyle and behavior change (FMOH August 2001).

2. Assessment Description

2.1 Objectives and Purpose

The overall goal of the assessment was to gain an in-depth understanding of the current status, challenges, and cost of providing HIV/AIDS care and services in Nigeria. The assessment encompassed ART, VCT, and PMTCT service provision under the federal government's National AIDS and STD Control Program and in the private sector (corporations, private clinics, faith-based initiatives, and NGOs). The assessment focused on the capacity of service provision at the national level within the public ART program and at the facility level in both the public and private sectors. It was a joint undertaking of the United States Agency for International Development (USAID), the Federal Ministry of Health, and the Nigerian Institute of Medical Research (NIMR), an FMOH parastatal organization.

2.2 Assessment Framework

The assessment focused on HIV/AIDS care and service delivery in USAID's eight focus states: Anambra, Bauchi, Edo, Federal Capital Territory (FCT), Kano, Lagos, Nassarawa, and Rivers. The specific objectives were to assess the following:

- ▲ **Policy:** The progress in developing and disseminating institutional policies, protocols, operational guidelines, and plans for highly active antiretroviral therapy (HAART) services to public, private, and NGO ART facilities. This included identifying levels of support from government (federal/state/local) and collaboration with government and other agencies
- ▲ **Service Capacity:** The service capacity of the institutions in providing HIV/AIDS care and services. This included assessing: (a) program model of care; (b) program management and evaluation capacity; (c) human resource capacity; (d) clinical care and counseling services; (e) laboratory services; and (f) community involvement.
- ▲ **Logistics:** The logistics system for management of ARV drugs, including: (a) logistics management information systems; (c) forecasting capacity; (d) procurement; (e) inventory management, storage, and distribution systems; and (f) organizational and human resource capacity for logistics management.
- ▲ **Cost:** The average per-patient cost of the various components of HIV/AIDS related services, including: (a) ARV drugs and consumable supplies; (b) laboratory monitoring tests; (c) personnel; (d) training; (e) equipment.

2.3 Methodology

2.3.1 Data Sources

The data were collected from four primary sources:

- ▲ Officials responsible for the implementation of the federal government ART program (Ministry of Health, Ministry of Finance, Federal Central Medical Stores [FCMS]).
- ▲ Representatives of the main manufacturing company supplying ARV drugs.
- ▲ Key staff at service delivery facilities in both the private and public sectors in the eight states. Staff interviewed includes (a) the program director, (b) the physician in charge, (c) the pharmacist, and (d) a lab technician.
- ▲ PLWHA from various PLWHA support groups and HIV/AIDS service providers. A total of more than 50 PLWHA in the eight states were interviewed.

2.3.2 Facility Selection

Selection of both public and private sector facilities for participation in the assessment was based on one criterion: The facility had to already be providing **at least one** of the following HIV/AIDS care and support services:

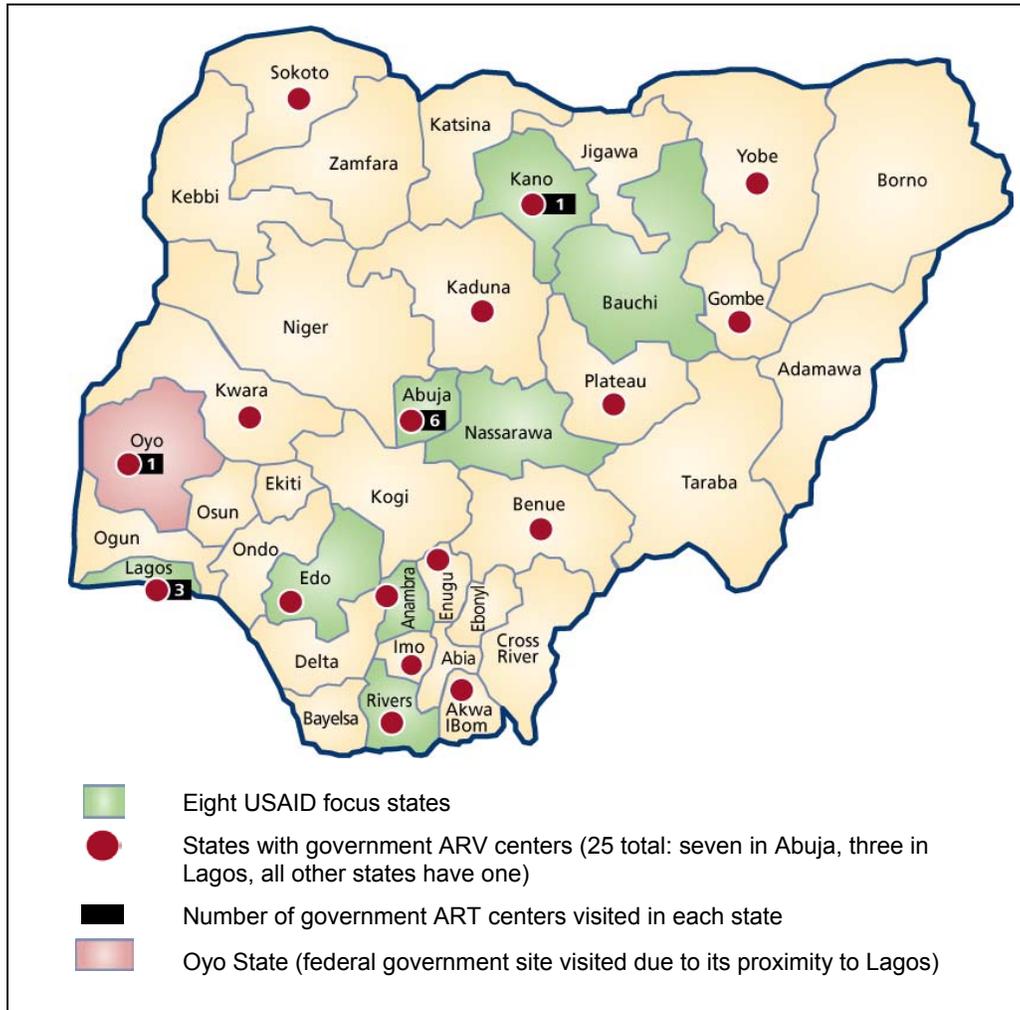
- ▲ Antiretroviral therapy;
- ▲ Voluntary counseling and testing (pre- and post-test counseling and testing on site);
- ▲ Prevention of mother-to-child transmission.

Public sector: The first category of facilities were the ART centers participating in the National ART Program, 12 of which are located in the eight USAID focus states. Ten of these facilities were visited; the ARV center in Oyo State was also visited, given its proximity to Lagos. The second category encompassed public sector facilities not enrolled in the federal program, including the ART clinic of a government parastatal in the FCT and three state-funded HIV/AIDS programs (in Anambra, Oyo, and Rivers). Thus, a total of 15 public sector facilities were visited.

Private sector: To select private sector facilities, a list of potential facilities was drawn from “HIV/AIDS in Nigeria: Survey of Health and Laboratory Facilities, 1989–1999,” a technical report by the NIMR and the 2001 “UNICEF Resource on NGOs and CSOs [Community Social Organizations] in Nigeria.” A list of contacts of the state action committees on AIDS was also obtained from NACA. A total of 51 facilities were visited in the eight focus states, including 35 private clinics, 12 faith-based programs, and four NGO programs.

Figure 1, a map of Nigeria, and Annex B list public and private sector facilities visited.

Figure 1: Map of Nigeria



2.3.3 Assessment Teams

The five teams assembled to conduct the assessment were multidisciplinary, comprising experts in each of the four assessment modules (policy, service capacity, logistics, and costing). The teams operated in different geographical locations; each was responsible for two states, with the exception of one team that assessed public sector sites in Lagos, Oyo, and FCT. Annex C contains a list of assessment team members.

2.3.4 Tools

The tools developed for the assessment also reflected the four assessment modules: policy, service delivery (including laboratory services), logistics, and costing. In addition, a PLWHA survey tool was developed to better understand the critical issues that affect the recipients of HIV/AIDS-related services. The assessment teams administered the tool to PLWHA associated with local NGOs, PLWHA support groups, and HIV/AIDS service providers.

2.3.5 Data Analysis

Data gathered on cost of drugs and services was analyzed using the AIDSTreatCost (ATC) software model developed by the Partners for Health Reform *plus* (PHR*plus*). Findings on service capacity and logistics management were analyzed using the “stages of readiness” tool developed by John Snow, Inc. This tool sets criteria to help the assessment of facilities’ readiness to implement ART and to select ART sites based on capacity, vision, and activities needed for rational introduction and expansion of ART into HIV care programs. In this assessment, the tool was used to rate each facility according to the stages outlined on the spectrum of program readiness.

3. Findings

This section presents findings from:

- ▲ Interviews with representative of the primary organs involved in the federal government ART program (National AIDS and STD Control Program; Ranbaxy, Nigeria; and the Federal Central Medical Stores).
- ▲ Data gathered from the public sector ART centers, supported by surveys with PLWHA groups affiliated with the federal ARV program.
- ▲ Data gathered from private sector facilities (faith-based organizations and private clinics).

3.1 Federal Government ART Program

Information gathered from interviews showed a gap in communication and coordination between the different program units in NASCP (e.g., ART, PMTCT, blood safety) and between NASCP and federal government health facilities. There is no forum or meeting at which information could be shared and no institutionalized communication or dissemination systems. As a result, information on program status, activities, and progress is not disseminated.

The interviews revealed that timelines for the finalization of draft guidelines for ART and VCT service provision have been postponed due to the lack of resources. In fact, the National ART Guidelines have not been reviewed and updated since they were drafted in 1997. In addition, these policy documents are only distributed during training programs organized by NASCP for health care providers at the facility level. Distribution of these documents outside of the government ART program, such as in the private sector, have not been effected.

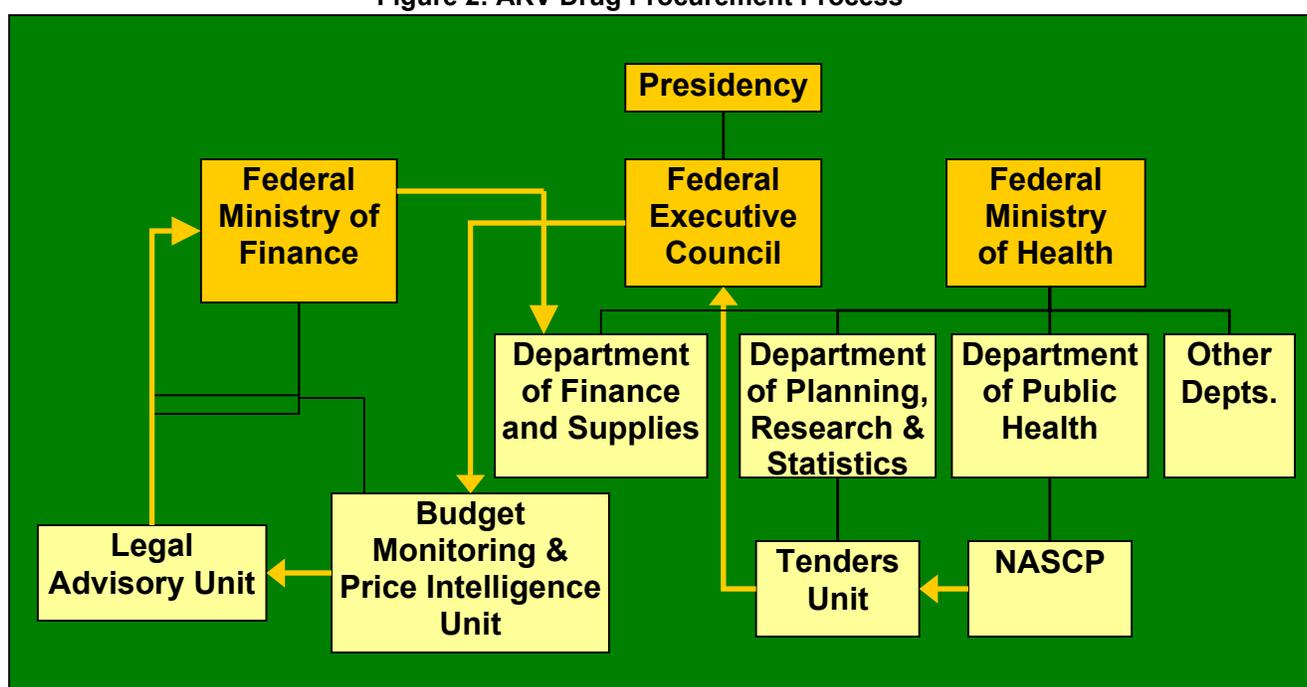
The last NASCP training program was conducted in Lagos in December 2003, and provided training in VCT to counselors from tertiary institutions, NASCP staff, and development partners such as Family Health International and WHO. However, NASCP staff indicated that funding for these programs often comes from donor projects, which is irregular and may need to be supplemented from other sources.

NASCP's final area of responsibility lies in the procurement of ARV drugs for the federal ART program. Under the leadership of NASCP, this is conducted through a complex process involving three other actors: the Federal Ministry of Finance, which facilitates the procurement of ARV drugs; the ARV drug supplier(s); and the FCMS, which receives and stores the drugs. The sections below present findings from interviews with representatives of NASCP; the Ministry of Finance; Ranbaxy, Nigeria, which supplies the majority of the drugs; and the FCMS.

3.1.1 Drug Procurement

The drug procurement process (Figure 2) begins with NASCP requesting the quantity and type of drugs to be purchased, based on advice from the ARV committee.² NASCP then submits its request to the FMOH Tenders Unit in the Department of Planning and Research. A committee on the Tenders Board evaluates the bids and sends the selected tender to the Federal Executive Council (under the Presidency) for approval, followed by a letter of award. The Budget Monitoring and Price Intelligence Unit of the Finance Ministry then issues the certificate of due process before the contract is sent for review by the Legal Advisory Unit. Twenty-five percent of the total value of the contract is then mobilized through the Ministry of Finance, which transfers the funds to the FMOH Department of Finance and Supplies. The procurement process takes 5-6 weeks, though the release of funds from the Ministry of Finance may cause further delays.

Figure 2: ARV Drug Procurement Process



The government allocated ₦1.5 billion (\$1.1 million) for procurement of ARVs in the 2004 budget.³ However, in light of the recent ARV shortage, the President authorized an accelerated emergency release of ₦500 million from the 2004 budget for ARV drugs. While the ₦1,000 paid monthly by each patient in the ART program is meant to partially sustain subsequent procurements, the funds are often used for other purposes.

² The ARV committee is a technical advisory body created by the FMOH to advise on the implementation of the National ARV Program. Current members are Professor John Idoko of JUTH (committee chairman); Dr. Edugie Abebe of the FMOH Department of Public Health (secretary); the director general of NIMR; representatives of the Food and Drug Administration and Control, Hospital Services Department, Global Fund Country Coordinating Mechanism, and NASCP; and some ARV site coordinators. Also on the committee are representatives from donor partners, including WHO, POLICY Project, and UNAIDS.

³ From interview with officials of the Tenders Unit, Department of Planning Research and Statistics, February 2004.

The government has not started procuring ARVs for children although plans to treat 5,000 children have been under discussion since the commencement of the adult ART program. In preparation, Ranbaxy, Nigeria has established a facility in Nigeria for the production of pediatric drug formulations, producing 1 million bottles of liquid ARVs (Nevirapine, Stavudine, and Zidovudine) per month, expected to be sold at a price of ₦1200 per bottle.

3.1.2 Drug Supply and Management

The first-line ARV regimen indicated in the National ART Guidelines was, as mentioned above, adapted from WHO guidelines based on international drug supplies. However, based on local drug availability, the first-line regimen actually being used in the public ARV centers is the combination of Lamivudine (Avolam), Stavudine (Avostav), and Nevirapine (Nevipan). The majority of ARV drugs under the government program are supplied by Ranbaxy, Nigeria, at a cost of \$300 (₦40,500) per patient per year and delivered to the FCMS. This price was negotiated under the assumption that the government duty of 22.5 percent of export value would be waived (in reality, between 2.5 and 5 percent remains). The drugs are air freighted from production facilities in India to the FCMS in Lagos at a cost of \$35/Kg.

When a shipment arrives at the FCMS, batch samples are collected and tested for drug quality by the National Agency for Food and Drug Administration and Control (NAFDAC). If the ARV drugs pass inspection, individual boxes are issued a stamp of approval. The testing process can take up to four weeks to complete. Upon arrival at the FCMS, the drugs are physically inspected for overall quality (packaging, quantity, etc.). No ARVs are accepted if the expiration date is less than 75 percent of the shelf life. Usually, three to four weeks will elapse from the time an order is issued to the manufacturer to the time when the ARVs arrive at the FCMS.

The team observed that the storage warehouse was large, clean, and well-maintained, though it was dimly lit and the roof was damaged. In addition, the FCMS has proper inventory management procedures in place for both ARVs and essential drugs. The distribution of ARVs from the FCMS to the treatment sites was originally contracted out to private distribution companies. However, due to chronic delays, recent NASCP policy dictates that centers are responsible for picking up their allocations and bearing the cost of drug transportation.

Each facility is granted a certain number of slots for ART patients. Letters indicating ARV drug allocations are sent out monthly to each facility. According to these allocation letters, the total number of patients in the government ART program at the 25 federal ART program centers is 13,043. However, over-enrollment of patients and budgetary shortfalls have resulted in periodic, widespread shortages of ARV drugs, the most recent of which occurred in late 2003.

3.2 Public Sector

While observations at the 15 public sector facilities varied, this paper presents the most common findings, as well as addresses other relevant issues. The findings from the public sector assessment are grouped into the following three areas: service delivery, drug management and logistics and cost of HIV services. However, two major issues, were observed regarding all areas:

First, there has not been a formal institutionalization of the national program at the majority of facilities: even after two years, most professional staff still refer to the program as a “pilot study,” and program coordinators are still called principal investigators, referring to their initial roles as

researchers. Facilities were not aware of recent program developments or any procedures for communicating updates or other relevant information.

Second, staff at most government facilities indicated dissatisfaction with past budget allocations from the federal government for HIV/AIDS services. At the time of the assessment, which was conducted at the end of the first quarter of the financial year, the federal government had not yet completed the 2004 budget allocations, evidence of the uncertainty surrounding governmental budgetary allocations. Budgetary constraints have limited the facilities' ability to conduct adequate training programs, recruit professional staff, and collect ARV drugs from the FCMS in Lagos. In general, facilities that are able to supplement their government funding with donor assistance or a drug revolving fund were able to operate at a higher level of service delivery.

3.2.1 Service Delivery

This service delivery section presents findings of the different components of HIV/AIDS services provided in the public sector facilities visited: (a) policies and guidelines, (b) program management and leadership, (c) model of care, (d) human resource capacity, (e) community involvement, and (f) laboratory services.

Policies and Guidelines

The research team observed that staff at nine of the 11 government program facilities knew about the 2003 National HIV/AIDS Policy and many stated that the policies were in practice, though copies were not available. Other than distribution of the policy during NIMR and National Institute of Pharmaceutical Research and Development (NIPRD) training programs, no general dissemination of these policies has taken place. However, service provision was observed to follow some of the general guidelines articulated within the national policy. Seven of the facilities were aware of the national guidelines on HIV/AIDS service provision, though there were no copies available as a reference for staff. Three facilities reported having national clinical manuals for the management of HIV in adults, and only two had developed their own guidelines. Written guidelines and procedures for HIV/AIDS-related services (such as patient eligibility, treatment drop-out, treatment of opportunistic infections, universal precautions, confidentiality, and legal counseling and rights of PLWHA) were not available.

Program Management

The majority of facilities utilized informal organizational and management structures to supporting HIV service delivery. Record keeping in many of the sites visited was consistent with standard operating procedures, and information on service provision was sent on a quarterly basis to the FMOH by each facility. Although most facilities referred to their quarterly reports, only two had copies readily available. Few facilities had adequate systems for the collection, collation, and analysis of patient demographic and clinical data. While some facilities utilized a manual patient record-keeping system, these systems were not designed to include HIV-specific data. As a result, few program coordinators were able to produce statistics related to their program activities. None of the facilities were able to conduct program-level monitoring and evaluation; thus decision making was not based on program performance indicators but on general case notes. Though staff at most facilities were aware of these deficiencies, they lacked the resources to develop monitoring systems.

Model of Care

The assessment teams observed a wide range of HIV/AIDS models of care. Only one facility offered a comprehensive HIV/AIDS care and service program, which includes adherence support, counseling, patient education, monitoring, and management of toxicities. At most facilities, the assessment teams found that the different HIV/AIDS service delivery programs (ART, VCT, and PMTCT) operated as separate activities with little or no communication between the different programs. This non-integrated approach clearly affects the quality of service and the costs of operating these programs and limits the shared knowledge that could be gained among the service delivery staff. VCT programs are frequently offered as a component of PMTCT programs, limiting access to VCT services to women who attend the facilities' antenatal clinic. For ART, all public sector facilities were using the standard drug regimen (Lamivudine, Stavudine, and Nevirapine). Patient eligibility for the program was based on CD4 count (200-350), although decisions regarding patient disqualification from the program were considered on an individual basis. The team also observed that, when adverse reactions or toxicities were observed, instead of fully changing the treatment regimen, patients were either given prescriptions to purchase second-line drugs directly from the manufacturer, or a single alternative ARV drug, such as Zidovudine, Didanosine, and Efavirenz, was substituted.

Most facilities' HIV/AIDS programs lack essential program components such as preparatory training of patients in treatment readiness and adherence support. While some facilities conduct home visits, which encourages treatment adherence, this was constrained by distance, insufficient budgets, incomplete tracking records, shortage of trained staff, and an erratic drug supply. Adherence is also encouraged by the involvement of patients in PLWHA support groups, even with minimal coordination by facility staff. It was also found that the time and cost of transportation from home to the treatment centers was a major obstacle to adherence. PLWHA spend an average of four to five hours traveling between home and treatment center, at significant cost.

Human Resource Capacity

Nine of the government centers visited have adequate staff for their existing HIV/AIDS service delivery programs. However, all but one of the facilities lacked professional counseling staff, relying on doctors, nurses, and pharmacists to provide counseling and testing services, often without any training in HIV/AIDS counseling practices. Professional staff were also lacking in other key specialty areas such as nutrition and social services. Poor staff development policies were also observed at all facilities. Too few staff had adequate and updated training, and the opportunity for reinforcement of training was limited. Many of the trained professionals were overstretched and work simultaneously in multiple health care programs, reducing the number of staff dedicated solely to HIV/AIDS service provision.

Community Involvement

Staff at most facilities express little interest in working with the community, though a few are involved extensively with community development activities such as providing space for and participating in PLWHA meetings and organizing community meetings with input from church groups, community leaders, and PLWHA. These facilities also offer free seminars and patient education sessions, at which contributions from the public are encouraged. Others offer coordinated HIV/AIDS campaigns for school children and encourage the participation of PLWHA, NGOs, traditional healers and community leaders. In general, local communities were not regarded as partners in HIV/AIDS activities, nor have they received sufficient support to organize themselves and

play specific roles in education and advocacy for prevention, care, and support. A major reason for this lack of participation is stigma and discrimination. Most PLWHA interviewed reported that they had to conceal their ARV drugs to avoid disclosing their current health situation, though these effects are often mitigated through involvement in local support groups.

Laboratory Services

Most facilities rely on the federal government (or, in rare cases, donors) for the provision of laboratory equipment. Each facility is responsible for maintaining their equipment, which is usually carried out through costly maintenance contracts arranged with laboratory suppliers. The public sector laboratory facilities are generally capable of conducting a full range of HIV-related tests. Over half of the sites assessed conducted the CD4 count tests in-house, while the remaining facilities referred these tests to the National Hospital, NIMR, NIPRD, and JUTH. Viral load tests were performed at only four facilities countrywide (National Hospital, NIMR, NIPRD, JUTH), to which all facilities refer for these tests. While facility staff indicated that monitoring tests were administered on a regular basis, PLWHA indicated that, in practice, these tests were administered very rarely due to the inability of patients to afford them. The majority of facilities operate a laboratory revolving fund and, therefore, had an adequate supply of test reagents; those facilities that do not, frequently experience reagent stockouts.

3.2.2 Drug Supply Management & Logistics

The supply of ARV drugs under the government ART program does not meet the demand in any of the public sector ARV facilities. Waiting lists of over 1,000 patients were observed, and many facilities have exceeded their quotas, resulting in ARV drug shortages.

Distribution System

The distribution of ARV drugs to each facility is based on the number of registered patients, specified in monthly FMOH allocation letters. With this authorization, ARV drugs are collected monthly by each facility from the FCMS in Lagos. While ARV collection is inexpensive for facilities in Lagos, those located outside of that city face high collection costs. Generally, a staff member travels by air (at least two days, roundtrip trip) to collect the drugs. Travel by road, while less expensive, takes 3-4 days and presents greater security risks – in one case, it required staff to spend the night at local police stations along the way. Security at all points of transfer is a primary concern due to the high value of ARV drugs.

ARV drug stockouts of two months were observed at some facilities due to the lack of funds for the monthly collection trips. Another factor contributing to stockout of drugs is the shortage of ARV drugs due to the treatment of patients beyond the number of those registered. As a result, the vast majority of PLWHA interviewed stated that they have at some stage missed taking their drugs for two weeks or more.

Inventory Control

Inventory control systems in place for managing ARVs were adaptations of facilities' essential drug inventory systems, though staff at some facilities recognized the need to upgrade their inventory systems and a few facilities were in the initial stages of implementing a computerized inventory

control system. Staff had received little if any formal training in inventory management procedures and there were no written procedures for ordering, storing, and dispensing ARV drugs or general storage guidelines for ARV and essential drugs. In general, facilities practiced first-to-expire, first-out inventory procedures. Storerooms were clean and well organized, though overall storage space was a common concern. Several facilities were in the process of expanding their current storage area, or are planning to add additional storage space. Most facilities did not have a separate storage area for ARVs. However, all facilities have established rigorous security measures for their products. Access to storerooms was limited to key personnel. Although most facilities did not have a separate storage area for ARVs, all facilities have established rigorous security measures for their products. Access to storerooms was limited to key personnel and facilities' compounds were fenced in and equipped with security guards and entry and exit security measures.

3.2.3 Cost of Providing HAART

This section presents a comprehensive analysis of the costs of HAART treatment. It is important to clarify the services that are included and those that are excluded from the cost estimates presented in this report. The focus of the cost assessment is on ARV treatment activities. Other HIV/AIDS-related interventions such as prevention programs, monitoring and evaluation, and administrative and managerial overhead costs, although crucial to a comprehensive national HIV/AIDS strategy, were not considered.

The cost analysis also focuses exclusively on total costs, such as costs associated with program requirements that would typically be included in the government's health budget (e.g., laboratory equipment and health care worker compensation). Clearly, the introduction of a large-scale public program to provide ART will mean displacing capital and labor from other activities within the health system, but the issue of opportunity costs is not addressed in this report.

The costs of ART service provision under the government of Nigeria program are broken down into eight primary categories: (1) ARV drugs; (2) ARV drug delivery; (3) staff salaries; (4) staff training; (5) monitoring tests; (6) laboratory equipment; (7) patient transport to and from facility; (8) screening and confirmation tests. Under the first seven categories, data are expressed as annual per-patient costs and are meant to represent the total cost of the provision of HIV/AIDS services. The cost of screening and confirmation tests, however, is not incurred annually and is examined separately.

ARV Drugs

Under the government program, the first-line ARV drug regimen of Lamivudine, Stavudine, and Nevirapine is provided to patients at a total price of ₦1,000 (\$7.14) per patient per month. The drugs are supplied under contracts with Cipla and Ranbaxy, Indian generic drug manufacturing companies. According to Ranbaxy, Nigeria, the company charges ₦42,000 (\$300) per patient year or ₦3,500 (\$25) per patient month (at the exchange rate of ₦140/\$US). Included in the drug cost is the cost of transporting the drugs from production facilities in India to the FCMS in Lagos. This price is far lower than the regular market price of the above regimen. Several factors influence the lower price offered under the government program: (a) the government waives most of the 22.5 percent import duty (2.5-5 percent is still charged); (b) the scale of the government drug procurement is far greater than the scale of the current drug demand in the private sector, allowing Ranbaxy to increase total profits in the long run by lowering prices to capture this market; and (c) the government drug procurement is considered a guaranteed source of demand over a long period of time, reducing the

risk and increasing the likelihood of long-term profits. Currently, the drugs are air freighted at an estimated cost of \$30-\$40/Kg where delivery by sea would cost \$4-5/Kg, but takes 4-6 weeks.

ARV Drug Delivery

A separate component of drug transportation cost is the cost of transporting the drugs from the FCMS to the federal ARV centers, borne entirely by individual facilities. Estimates range from ₦500/month at the Lagos facilities to more than ₦47,000/month (₦130 per patient per month) at the Abuja facilities. The Abuja figures are regarded as representing a program average since (a) Abuja has the largest concentration of federal program sites (seven) and (b) Abuja lies close to the geographic center of the country, mid-way between the FCMS (in Lagos) and the farthest facilities.

Staff Salaries

The majority of staff is paid according to the Harmonized Tertiary Institutions Salary Scale (HATISS), which defines staff salaries for different staff members with different levels of experience. However, in some cases, staff are paid based on an “extended” HATISS scale designed to provide supplemental compensation to staff at key facilities. While there was considerable variation in salaries at the sites assessed, the figures in Table 1 represent average salaries for each staff category:

Table 1: Salaries of Key Staff

Staff	Average Annual Salary (₦)	Observed Average Number of Full-time Equivalent (FTE) Staff
Doctors	1,540,000	4
Nurses	690,000	9
Lab specialists	790,000	2
Counselors	470,000	1
Social workers	430,000	0
Pharmacists	900,000	2

Note that the average “full-time equivalent” number of staff given above was obtained by multiplying the number of staff per facility by the proportion of time spent on HIV/AIDS services in an average workweek. This is converted into a per-patient figure by dividing by the average number of patients served per facility (359), yielding an annual per patient cost of ₦ 47,000 (\$336).⁴

The sites assessed exhibited large variations in their staffing structure. To allow a comparison of staffing figures across multiple facilities, the authors have developed a standard staffing structure. Based on an interview conducted previously with Dr. John Idoko of JUTH, the following staff, working four out of five days per week, could provide adequate HIV/AIDS service to 2,500 patients. While the staffing pattern shown in Table 2 serves as a useful model in this context, many successful programs around the world operate with a higher proportion of counselors and social workers. In addition, it should be noted that JUTH staff are well trained, receive salary supplements, and are allowed to concentrate almost exclusively on HIV/AIDS patients.

⁴ Average staffing figures excluded outlier data from two facilities, as they would skew results.

Table 2: Staff Providing ART to 750 Patients at JUTH

Staff	Average Annual Salary (₦)	Number of Staff	Number of FTE Staff
Doctors	1,540,000	8	6.4
Nurses	690,000	7*	5.2
Lab Specialists	790,000	3	2.4
Counselors	470,000	3	2.4
Pharmacists	900,000	2	1.6

*Note: The figure for nurses includes two nutritionists.

Using the same salaries as above, the annual per patient cost is calculated at ₦ 7,300 (\$52).

Staff Training

It was found that the average facility staff member participated in slightly more than one day of training in 2003 (see Table 3).

Table 3: Public Sector Staff Training Levels

Staff	Number of FTE Staff	Average Number of Training Days per Year
Doctors	4	1.5
Nurses	9	0.5
Lab specialist	2	1.9
Counselors	1	2.4
Social workers*	0	2.8
Pharmacists	2	1.1
Average		1.1

* There are few social workers and they cover multiple facilities; therefore, their average FTE per facility is negligible. These social workers overall receive appreciably more training than their private sector counterparts, as will be seen below.

The costs of providing training were not generally known at the facility level as staff usually participated in training programs organized by the federal government or donor agencies. Interviews conducted at the Nigerian National Petroleum Corporation, however, yielded the following costs for participation in training programs in ARV service provision (Table 4):

Table 4: Costs per Person for Participation for One Week of Training

Description	Cost/week (₦)
Participation fee	50,000
Per diem costs (₦16,000/day)	80,000
Transportation costs (on average)	25,000
Total weekly cost	156,000
Total daily cost	31,200

To convert these training costs into per-patient figures, we incorporate averages for: (a) patients served at each facility; (b) length of training for each staff member (Table 3); and (c) number of staff at each facility. On average, facility staff served 359 patients, resulting in an annual, per-patient training cost of ₦1,724 (\$12). The results show that training accounts for less than 2 percent of total cost. This figure is low for two reasons: (1) one trained health worker can provide services to a large number of patients; and (2) the majority of facilities acknowledged that their staff did not regularly receive adequate training.

It should be noted that training costs are calculated as annual costs, because training costs (for on-the-job training and refresher courses for existing and new staff) are incurred throughout the year. Defining the length of time of a sustained training program would allow a determination of the cost of training under ideal circumstances. Again we examine the concept of a standard, sustained training program, using Dr. Idoko's estimate of 10 days refresher training per year for every staff member, which assumes that staff already have adequate training in basic ART service provision. The annual per patient cost of this training program is estimated at ₦16,420 (\$117) per patient, much higher than the current cost.

Monitoring Tests

The cost of monitoring tests includes the cost of (a) test reagents and (b) consumables (all the syringes, bottles, gloves used to administer the tests). Data on the cost of consumables were drawn from a single interview with Lagos University Teaching Hospital (LUTH) lab staff, and suggests that the annual per patient cost of the consumables is ₦ 1,540 (\$11), a relatively small amount, compared to the combined cost of the reagents, but significant nonetheless.

The assessment teams collected relatively reliable data on the unit cost of reagents. However, converting these unit costs into annual costs requires a clear determination of how often they are conducted. Estimates of the frequency of these tests were taken from three different sources: (a) Clinical Guidelines on Management and Care for HIV/AIDS, (b) individual facilities and (c) PLWHA support group coordinators (see Table 5).

If we use the frequencies suggested by the clinical guidelines, the total annual, per-patient cost of monitoring tests will be nearly ₦30,000 (\$204). The total cost figure includes a 5 percent lab reagents charge for wastage (industry standard). Note that these figures represent a maximum cost, only incurred only if patients receive the full range of tests indicated in the clinical guidelines.

Table 5: Cost and Frequency of Laboratory Monitoring Tests

Test	Unit Cost (₦)	Number of Tests Per Year		
		PLWHA	Facility	Clinical Guidelines
Full blood count	₦ 580 (\$4.74)	0.9	8	3
Urea/Creatinine	₦ 460 (\$3.29)	0	7	3
Blood sugar	₦ 260 (\$1.86)	0	6	3
Liver Function	₦ 1,140 (\$8.11)	0.75	7	3
CD4 Count	₦ 2,980 (\$21.25)	0.6	3	2
Viral Load	₦ 12,710 (\$90.82)	0.4	2	1
Consumables	₦ 1,570 (\$11.22)			
Total				₦ 28,520 (\$203.70)

Laboratory Equipment

Equipment costs are fixed costs and are allocated across the number of people treated under a given scenario. According to the FMOH, all ARV treatment sites should have a set of standard equipment to conduct patient monitoring tests. The equipment includes a thermal cycler, polymerized chain reaction (PCR) machine for viral load tests, and chemistry and hematology analyzers. Currently, all treatment sites already have chemistry and hematology analyzers, but only four of the facilities visited have the capacity to monitor CD4 counts and viral load. The total cost of all relevant equipment is approximately ₦4,000,000 (\$29,000) annually (annual figures assume a 20 percent annual depreciation rate for capital equipment). This cost is equivalent to ₦2,240 (\$16) annually per patient.

Patient Transport to and from Facility

The cost of patient transport is often neglected when calculating the total cost incurred by patients in an ART program. Interviews with facility staff, confirmed by data collected in interviews with PLWA support group coordinators, revealed that the average patient pays ₦400 (\$3) in transport costs. This cost is incurred for monthly travel expenses to pick up drugs and undergo follow-up monitoring tests. The travel cost varies according to distance from facility (₦300 (\$2) to ₦1,000 (\$7)). These transport costs are significant when compared to the ₦1,000 paid monthly for the drugs. Data from the PLWHA interviews indicate that travel costs often contribute to patients dropping out of the program.

Screening and Confirmation Tests

The algorithm for VCT testing varies from facility to facility. For the purpose of this report, the algorithm suggested by the “National Guidelines for the Use of Antiretroviral Drugs in Nigeria,” a series of two tests, was used (FMOH July 2001). The average cost of the screening test is ₦560 (\$4) and of the confirmation test ₦2,660 (\$19). Thus, those who test negative will pay a total of ₦560 (\$4) and those who test positive pay ₦3,220 (\$23). Calculating the total VCT costs incurred under the

government program would require additional epidemiological data, which was not collected in the assessment. For a more detailed analysis of these costs, the reader may refer to the February 2004 *PHRplus* study (Dombe, Galaty, and Nwagbara 2004).

Total Cost

The annual per-patient cost of ART services is estimated at \$913, not including screening and confirmation and the testing and treatment of opportunistic infections. The cost of staff salaries is the largest single component, followed by ARV drugs and monitoring tests. The costs of training, patient transport, and laboratory equipment are relatively small in comparison. Table 6 shows the relative magnitudes of the seven annual program costs.

Table 6: Components of Total ART Cost in the Public Sector

Component	Annual Per Patient Cost	% of Total ART Cost
ARV drugs	\$300	32.9%
Staff salaries	\$336	36.7%
Training	\$12	1.3%
Lab equipment	\$16	1.8%
Drug transport	\$11	1.2%
Monitoring tests	\$204	22.3%
Patient transportation to facility	\$34	3.8%
Total cost	\$913	100.0%

3.3 Private Sector

Findings in the private sector include interviews with staff at private clinics, faith-based programs, and NGO programs. These findings are presented in the following areas: service delivery, drug management and logistics, and cost of HIV services.

3.3.1 Service Delivery

This service delivery section presents findings on the different components of HIV/AIDS service provision in the private sector facilities visited: (a) policies and guidelines, (b) program management and leadership, (c) model of care; (d) human resource capacity, (e) community involvement, (f) laboratory services, and (g) public-private partnership.

Policies and Guidelines

Staff at most facilities were not familiar with the national HIV/AIDS policy nor with any public sector guidelines and protocols, and that had no internal policies, written guidelines, or protocols, with the exception of some faith-based organizations that operate under the HIV/AIDS policy of the Christian Health Association of Nigeria and the Catholic Secretariat. A few employer-based programs visited have developed their own policies (e.g., Shell Petroleum Development Cooperation of

Nigeria). Facilities are yet to define or document facility-specific ART and PMTCT protocols. Clinical manuals for the management of HIV in adults and children were not available and the majority of the private clinics expressed that developing protocols was not a high priority.

Procedures surrounding HIV testing and confidentiality, though not documented, were in practice at most private facilities. In most cases, HIV testing is mandatory for certain categories of patients (antenatal clients, blood donors, pre-operative patients), although some facilities emphasized informed consent prior to testing. Almost all facilities maintain some degree of confidentiality in HIV testing and disclosure of results, although few facilities have identified a protocol and testing algorithm by which they can perform tests.

Program Management and Leadership

Few facilities have a strong leader with vision and experience to manage an ART program. Most facility leaders have identified some potential model of HIV care that can be adapted to include ART but have inadequate experience with ART protocols. With the exception of employer-based programs and faith-based facilities, the majority of clinics have no formal organizational structure in place for the management of HIV/AIDS care and services. In general, all decisions regarding service provision are made by the medical director. Although all of the health facilities had a medical record system, the records did not include HIV-specific data, and analysis of available data was not observed. As a result, facilities did not have systems for program monitoring.

Model of Care

The majority of facilities did not offer comprehensive services as the additional services required for ART in areas such as adherence support, patient follow-up, patient education, management of toxicity, and treatment failure. The HIV-related services provided are usually limited to VCT. Because few patients can afford private sector ARV drug prices, most patients are referred to the nearest public sector ARV facilities for treatment. This includes patients in critical condition due to an HIV-related illness. In some cases, private health care providers turn away HIV-positive clients who require procedures such as laparoscopy, endoscopy, and Caesarian section in order to avoid equipment contamination. Such facilities recommend having equipment specifically for HIV clients. Even the few who can afford private sector treatment often skip treatment due to financial constraints. Patient eligibility and exclusion criteria are not defined, nor are screening and enrollment procedures. Some facilities determine patients' eligibility to initiate therapy using a CD4 count, although the majority of the sites initiated their patients' therapy based on objective signs and symptoms of illness.

In cases where physicians are prescribing ARVs, most have to learn on the job about the type of drugs and their prescription. Physicians treating a small number of (fewer than five) patients on ART often prescribe inadequate ART therapy such as dual or mono therapy, or inappropriate therapy such as (in one case) steroids. These examples clearly illustrate the lack of regulation and monitoring of private sector ART programs. Although most of the facilities visited offered VCT, this service is also provided with its limitations. Few facilities offer guidance to HIV-positive patients on next steps in seeking care and treatment, or HIV-negative patients to reinforce messages of prevention. In general, patient monitoring and tracking is inadequate due to the cost of monitoring tests. Follow-up is usually viewed as the patient's responsibility. Educational information on HIV/AIDS care and services at private sector facilities is haphazard and depends largely on the effort of clinic staff. Despite cases of patients losing their jobs due to their HIV status, none of the facilities offered any form of legal counseling. Finally, stigma is still a major factor, as staff at some facilities complain of being labeled as "HIV hospitals," leading to reduced attendance by non-HIV patients for fear of being infected.

Human Resources

Opportunities for staff development are few and consist of occasional in-house workshops and seminars organized by hospitals and private sector agencies such as the Guild of Medical Directors. Occasionally, some private facilities collaborate with NGOs to implement training programs and HIV/AIDS campaigns. However no well-defined staff development plan exists in any of the sites visited. Many of the private facilities were losing their staff to public institutions due to higher salaries in the public sector. Private clinics have been isolated from the public sector capacity-building initiatives.

This attrition of staff was especially observed in the provision of VCT. With the exception of faith-based organizations and NGOs, the majority of facilities did not have a dedicated counselor. Usually, the physician in charge or the head nurse provides counseling from training received at either a one-day workshop or seminar on HIV counseling and testing. Training programs and educational materials are rarely available to staff at private sector facilities. In states where both private and public sector sites were visited, the team observed that limited counseling time is given to clients prior to HIV testing by the private facilities, compared to public and faith-based facilities.

Community Involvement

Despite the importance of community involvement in the provision of HIV/AIDS services, it was found that, with the exception of faith-based organizations, facilities rarely interact with local community groups. Few PLWHA groups are linked to private clinics and few NGO activities on HIV/AIDS have been recorded. A few of the counselors stated that they have conducted outreach campaigns to raise the level of awareness, but resources to sustain these campaigns are lacking and, as a result, the effort has been inconsistent. Most facilities do not involve PLWHA in the provision of HIV/AIDS care and services, though on some occasions, clinics invite executive members of the Network of People Living with HIV and AIDS in Nigeria (NEPWHAN) to attend meetings and seminars.

Laboratory Services

Most of the laboratories visited do not provide the CD4 count test and even fewer perform a viral load test. Patients are usually referred to the public ARV centers for these tests and patients often travel great distances with no guarantee of obtaining the recommended tests. However, many facilities perform routine tests such as hemoglobin, full blood count, or rapid HIV tests and pregnancy tests. Some laboratories have limited access to minimum WHO protocols but no quality assurance monitoring process while others had extensive capacity in screening, monitoring and toxicity management. There is no formalized tracking system for patients who have been referred to public facilities for laboratory testing.

Public-Private Partnership

Public-private partnership is virtually non-existent, and the majority of the private sites do not receive any form of support from the government. There are no formal linkages between private and the public sector ART programs, except for the referral of patients for drugs and other laboratory-related services. Many private sector facilities expressed the desire for greater collaboration between the public and private sector to ensure better service delivery and follow-up care and treatment for patients. The assessments teams observed a unified aspiration among leaders in the private sector sites for better collaboration between the public and private sectors.

3.3.2 Drug Supply and Management

3.3.3 ARV sourcing is conducted in an ad-hoc manner in the private sector, hence the team observed wide variations of ARVs and ARV combinations. In cases where patients could afford the drugs, the physician in charge procured them directly from the various drug manufacturers, though long-term financial commitment for the supply of ARV drugs was not secured in any of the facilities visited. The majority of facilities did not keep any stock of ARV drugs due to the up-front cost and fear of pilferage. In those facilities that did store ARV drugs, inventory management was limited to the use of bin cards. In some instances, the hospital director stored the ARV drugs in his/her consulting room for safekeeping and distribution. Many of the facilities have adequate storage facilities for their drugs given their current capacity, though they could accommodate an increase in inventory.

3.3.3 Cost of Providing HIV Services

This section presents a comprehensive analysis of the costs of HAART in the private sector. An analysis of each component of ART service cost is presented. However, there are some key differences in private sector service provision that have implications for cost analysis:

- ▲ Due to the scarcity of data, it is not possible to make cost comparisons between services provided by faith-based organizations, NGOs and employer-based programs. Thus the analysis below presents average costs across all private sector facilities.
- ▲ Most private facilities are in the process of initiating ART programs and depend heavily on government centers for laboratory diagnosis, treatment, and patient monitoring. Therefore, the public sector is used as a frame of reference for the private sector cost analysis, private sector costs being presented in comparison to equivalent costs in the public sector.
- ▲ Private sector service providers do not collect periodic data on the number of patients served, making an analysis of per-patient cost impossible. Therefore, the per-patient costs given below are calculated using public sector patient numbers.

ARV Drugs

All ARV drug costs shown below represents the price currently available for patients who are receiving treatment from private health facilities. In many cases, ARV combinations are different from those prescribed in the public sector. Therefore, the cost of ARV drugs to patients varied, depending on the drugs being administered and whether the purchase was made in bulk.

On average, the per patient cost of the most commonly used drug regimen (the same regimen used in the government ART program) was ₦22,450 (\$160) per month, approximately ₦270,000 (\$1,924) per year, almost six times the public sector cost ₦43,540 (\$311).⁵

⁵ Including drug delivery cost, from the FCMS in Lagos to the facility.

Staff Salaries

Salaries for providers in private facilities varied considerably. Some facilities pay specific (specialized) staff according to profits rather than the HATISS scale used in the public sector. The salaries were consistently lower – less than half – than those in the public sector, resulting in high staff turnover. Table 7 shows the average observed salaries for each staff category. Under the staff configuration shown, which can treat 2,500 patients, the annual cost of staff salaries is ₦3,690 (\$26) per patient.

Table 7: Comparison of Average Annual Salaries

Staff	Average Annual Salary (₦)		Number of Staff (Standard Scenario)
	Private Sector	Public Sector	
Doctors	930,000	1,540,000	8
Nurses	300,000	690,000	7
Lab. Specialist	240,000	790,000	3
Counselors	260,000	470,000	3
Social Workers	250,000	430,000	0
Pharmacists	360,000	900,000	2
Average	390,000	800,000	23

Staff Training

Private sector facilities are not generally included in training programs organized for public facilities but take part in periodic NGO- and donor-sponsored training programs. Because costs are covered by external funding sources, training cost data collected from private sector facilities may be unreliable. It is possible, however, to compare number of days of training per year in the private sector to that in the public sector (see Table 8):

Table 8: Average Annual Training Days for Health Professionals for ARV Provision

Staff	Average # of Training Days per Year	
	Private Sector	Public Sector
Doctors	2.4	1.5
Nurses	0.6	0.5
Lab Specialist	2.5	1.9
Counselor	0.6	2.4
Social Worker	0.0	2.8
Pharmacist	4.5	1.1
Average	2.4	1.1

Training levels for the average staff member are significantly lower in the public sector, though counselors and social workers receive far greater training in the public sector. This may reflect the fact that, in situations where only a few key staff from each facility have access to training programs, public sector facilities, with more staff overall, show lower average training levels.

Monitoring Tests

Table 9 shows the cost of laboratory monitoring tests in the public and private sectors. Test frequencies are analyzed based on the National VCT Guidelines, though actual compliance to testing protocols is expected to be much lower. It should be noted that the majority of private facilities refer these tests to public sector facilities and that some private sector test costs may have been underestimated as they may not take into account all costs.

Table 9: Unit Cost of Laboratory Monitoring Tests

Test	Unit Cost (₦)	
	Private Sector (Average)	Public Sector (Average)
Full blood count	410	580
Urea/Creatinine	964	460
Blood sugar	340	260
Liver function tests	1,230	1,140
CD4 count	800	2,980
Viral load	5,000	12,710

Laboratory Equipment

Many private facilities do not have access to the laboratory equipment needed for HAART and rely mainly on referrals to government facilities. The cost of some types of equipment is significantly higher in the public sector (Table 10). However, given the high rate of inflation in Nigeria over the past few years, this may simply reflect the length of time since most recent purchase.

Table 10: Cost of Lab Equipment

Equipment	Average Equipment Cost (₦)	
	Private Sector	Public Sector
Thermal cyclor	630,000	630,000
Real-time PCR	2,240,000	2,240,000
Flow cytometer	2,100,000	4,890,000
Hematology analyzer	1,710,000	4,500,000
Chemistry analyzer	1,850,000	2,700,000

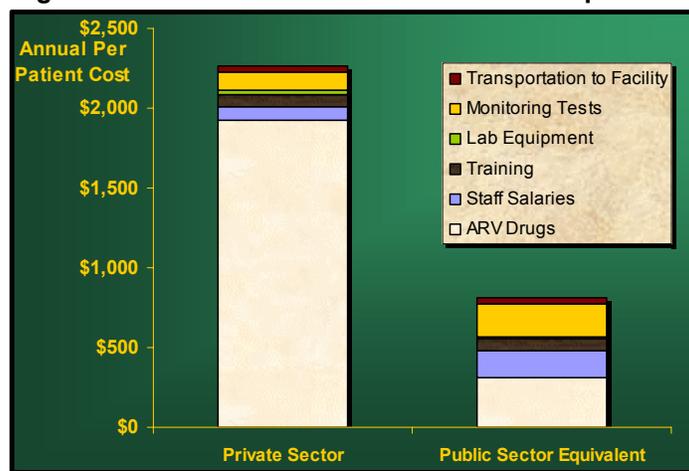
Screening and Confirmation Tests

Small differences were observed in screening and confirmation costs in the public and private sectors. On average the per-patient screening costs were higher ₦1,170 (\$8) and the confirmation costs were lower ₦2,120 (\$15) in the private sector. Thus, compared to the public sector, the cost of testing in the private sector is higher for HIV-negative patients (\$8) but the same for HIV-positive patients (\$23).

Total Cost

Figure 3 illustrates the magnitude of the components of ART service cost in the private and public sectors, using public sector data where no private sector data was available.

Figure 3: Private and Public Sector Cost Components



Clearly, the cost of ARV drugs dominates private sector service provision, accounting for 85 percent of the total cost. The other cost components are lower in the private sector than in the public sector, possibly representing a difference in service quality in the public and private sectors, suggested by anecdotal information and observation.

Another possible approach to calculating the total cost of service provision in the private sector is the consultation fee per patient visit. The number and cost of follow-up visits varied among facilities and states. The average cost per follow-up visit was ₦4,163, or \$357 per year, assuming one follow-up visit per month. In a private sector facility, this revenue must at least cover all facility costs not paid for separately by the patient (rent, salaries, training, equipment, drug transport), indicating that these costs cannot exceed \$357/patient per year. Comparing this to the cost of these components in the public sector, ₦55,000 (\$375), we see that public sector costs are somewhat higher, despite the fact that the cost of hospital infrastructure (the public sector equivalent of rent), is not included. Therefore, it may be concluded that the total cost of ART services in the private sector are significantly lower than those in the private sector (excluding ARV drugs).

4. Conclusions

4.1 Federal Government Program

NASCP has an inadequate budget for its range of activities despite its central role in the management of the government ART program. This has led to insufficient budgetary allocations for program-level activities such as (a) formulating and disseminating national HIV/AIDS policies; (b) training programs for state and local AIDS control programs and health care facilities; and (c) ARV drug procurement. In addition to budgetary shortfalls, NASCP does not have adequate managerial and organizational capacity to implement a program of this size and complexity. This situation is aggravated by insufficient systems for the dissemination of crucial budgetary, policy, and procedural information. Under the current organizational structure at NASCP, the different HIV/AIDS service delivery programs (ART, VCT, and PMTCT) operate as separate activities with little or no communication between them. This non-integrated approach clearly affects the quality of service and the costs of operating these programs, limits the shared knowledge that could be gained, and encourages similar non-integrated program structures at public sector facilities.

National policies and guidelines for the provision of HIV/AIDS services are not only out of date, but have limited distribution. In addition, the available guidelines do not include eligibility (biomedical, social, and economic) and exclusion criteria for therapy, current first-line and second-line treatment regimens and patient monitoring.

Over-enrollment of patients, budgetary shortfalls, and delays in budget release are common, often resulting in ARV drug shortages. Patient ARV drug co-payment contributions are not properly managed, no data have been collected on the maximum patient capacity of the ART program, and there are no operational plans for scaling up the program. ARV drug procurement takes approximately six to eight weeks from the time the ARV contract is awarded to the supplier to the delivery of the products to the central store system. The system is inflexible and orders are made on an annual basis, rather than against a long-term contract.

4.2 Public Sector

Budgetary constraints limit the facilities' ability to provide a complete range of HIV-related services, recruit professional staff, conduct adequate HIV/AIDS training programs, and collect ARV drugs from the FCMS. Facility staff are overextended and have insufficient training in key technical areas (counseling, nutrition and social services) to provide complete HIV-related services. Inadequate systems for the collection, aggregation and analysis of patient data have led to non-existent program-level monitoring, evaluation, and decision-making. As a result, there is no information available to inform program-level decision making.

Most facilities were aware of national policies, guidelines, and protocols on HIV/AIDS service delivery and follow some of the general guidelines and protocols articulated within the national policy, though these materials were rarely available for reference. Centers do not have the necessary

guidance and support to establish comprehensive ART programs, resulting in their lacking essential components of ART such as VCT, patient education, adherence support, patient monitoring, legal counseling, and other care and social support services. In addition, few centers have created partnerships with community groups, such as PLWHA, although such groups have been key advocates of improved federal government HIV/AIDS service provision. The public sector laboratory facilities are generally capable of conducting the full range of HIV-related tests, though patients are rarely able to afford the tests. Facilities are responsible for the management of laboratory supplies and generally operate drug revolving funds at full cost to the patient.

ARV drug management is based on facilities' essential drug systems. Storing and ordering procedures for ARV drugs do not exist and facilities lack essential components of a logistics system. Therefore, consumption data reporting and changes in stock status are not standardized in the system, and the information gathered is not systematically aggregated to update quantification and procurement.

The annual, per-patient cost of ART services is estimated at \$913, not including screening and confirmation and the testing and treatment of opportunistic infections. The cost of staff salaries is the largest single component, followed by ARV drugs and monitoring tests. The costs of training, patient transport, and laboratory equipment are relatively small in comparison. Table 11 shows the relative magnitudes of the seven annual program costs, broken down by who is responsible for the cost.

Table 11: Components of Total ART Cost in Public Sector Facilities

Component	Who Pays	Annual Per Patient Cost	% of Total ART Cost
Government drug subsidy	Federal government	\$214	23.5%
Staff salaries	Federal government	\$336	36.7%
Training	Federal government	\$12	1.3%
Lab equipment	Federal government	\$16	1.8%
Federal government total	Federal government	\$578	63.3%
Drug transport - Facility total	Facility	\$11	1.2%
Monitoring tests	Patient	\$204	22.3%
Patient drug copayment	Patient	\$86	9.4%
Transportation to facility	Patient	\$34	3.8%
Patient total	Patient	\$324	35.4%
Total ART cost		\$913	100.0%

The burden of the costs is distributed among: (a) the federal government, (b) the facility, and (c) the patient. The bulk of the burden (over 60 percent) falls on the federal government. However, the annual patient burden also is high ₦47,320 (\$324); given Nigeria's per capita gross national income of \$320 (World Bank 2004), this is affordable to only a small proportion of Nigerians. The costs of laboratory monitoring tests (if conducted according to the clinical guidelines) and patients' monthly contribution to ARV drug cost are well beyond the capabilities of the majority of patients. While the annual facility burden is relatively small (less than 2 percent of the total cost), this expenditure needs to be adequately budgeted to sustain the program.

The average cost of screening and confirmation tests is ₦560 (\$4) and ₦2,660 (\$19) respectively. Thus the total cost of screening per ARV patient is around ₦560 (\$4) per-patient for

those who are HIV-negative and ₦3,220 (\$23) for those who are HIV-positive. Calculating the total VCT costs incurred under the government program would require additional epidemiological data, which was not collected in the assessment. Nor did this assessment collect data on the costs of testing for and treating opportunistic infections, but these are expected to represent a significant additional cost burden.

4.3 Private Sector

Because few patients can afford private sector ARV drug prices, most ART patients are referred to the nearest public sector ARV facilities for treatment. National guidelines on ART treatment were not accessible in the private sector, except at faith-based organizations. Private sites have not developed guidelines for clinical management and other aspects of HIV care and services such as prevention and follow-up. Most facilities providing ART have not identified operational procedures for HIV care and ARV use, nor do they have adequate systems for patient tracking, follow-up, and program monitoring. Laboratory monitoring tests were rarely conducted due to their cost. With the exception of some faith-based programs, community outreach activities were generally considered outside the mandate of private sector facilities.

Though the public sector has been providing ART services for only a short time, it has far greater capacity, treats a higher volume of patients, and is more advanced than the private sector. Therefore, the private sector sites can greatly benefit from public-private partnerships. However, the majority of the private sites do not receive any form of support from the government, and there are no formal linkages between private and the public sector ART programs, except for the referral of patients for drugs and other laboratory-related services. Many private sector facilities expressed the desire for greater collaboration between the public and private sectors to ensure better service delivery and follow-up care and treatment for patients.

5. Recommendations

In order to scale up the HIV/AIDS response in Nigeria, the authors suggest seven recommendations:

- ▲ **Optimize HIV/AIDS service delivery.** The federal government should consider defining a package of services offered at each type of health facility based on which providers are best positioned to provide them. This would be coupled with well-defined linkages between the different service providers and result in an optimal allocation of comprehensive ART service provision. Training would then be provided to providers according to the service being offered and would be extended to include groups such as private sector providers, PLWHA groups and community health workers.
- ▲ **Improve ART program management and financing.** NASCP should consider establishing a task force responsible for engaging the main stakeholders (ARV committee, action committees on AIDS at all levels of the system, PLWHA groups, and the private sector) of the ART program to develop a strategic framework to prioritize programming areas, define resource requirements, and set program performance measurement. It is recommended that priority-setting be based on realistic cost, availability of funds, and financial sustainability. The federal government should also identify multiple funding sources including international donors for the ART program.
- ▲ **Update, finalize and disseminate national guidelines** on (a) voluntary counseling and testing, (b) initiating ARV therapy (first- and second-line regimen, patient eligibility criteria, patient monitoring, and patient education on adherence), (c) pediatric treatment and treatment for children, and (d) prevention of mother-to-child transmission.
- ▲ **Ensure a flexible, long-term procurement mechanism.** NASCP and the federal government should consider establishing a long-term, open-order contract for ARV drug procurement, which would include a guaranteed minimum annual purchase level over a period of time with the option to make additional purchases. This would allow the manufacturer to develop long-term production and distribution plans, which could lead to more cost efficient transportation (e.g., sea freight rather than air) or local production facilities, reducing overall ARV drug cost significantly.
- ▲ **Establish an efficient, reliable, and secure ARV drug distribution system.** The federal government should consider implementing a nationwide ARV distribution system to replace the existing collection system. This would reduce the cost of drug transportation and the risk of drug stockouts, and require both the allocation of funds from the federal program budget and the development of a feasible distribution schedule. This type of system may be implemented by one of the following parties: (a) the Federal Central Medical Stores, (b) private carriers, or (3) drug suppliers (i.e., included in drug price). The development of a logistics management information system and ensuring adequate storage facilities at the FCMS would also improve the effectiveness of an ARV distribution system.

- ▲ **Reduce patient out-of-pocket expenditure on laboratory tests.** The federal government, with the help of donor agencies, should consider re-evaluating the frequency of monitoring tests dictated in the clinical guidelines and instituting subsidy programs for screening, confirmation, and monitoring tests. This would have the effect of (a) enhancing prevention and surveillance activities through more widespread testing, (b) establishing more consistent patient monitoring, leading to better monitoring and evaluation, and (c) improving the possibility of potentially valuable clinical research. Financing through donor and private sector (e.g., insurance or private-public partnership) sources should be explored.

- ▲ **Strengthen the ART program in preparation for expansion.** The federal government has indicated the desire to expand the government ART program by establishing additional facilities in every state that currently lacks a facility (a total of 12 additional sites). Based on the program costs presented above and analysis conducted by PHRplus (Kombe, Galaty, and Nwagbara 2004), expanding the program in this way would cost an additional \$6.3 million annually, bringing the total annual program cost to \$14.2 million and require a total of 276 additional clinical staff. However, before considering program expansion, the government needs to improve essential program management and capacity-building structures and budgetary allocations. Enhancing the existing program before scaling up will lead to higher quality, more complete service provision in the short run, and increased capacity for expansion in the long run.

Annex A. Persons Contacted

ARV Committee

Professor John A. Idoko, Chairman

CDC Global AIDS Program

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Civil Society Consultative Group on AIDS in Nigeria

B. Nkechi Onah

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Federal Ministry of Health

Dr. Abebe, Director, Department of Public Health

Dr. O. Salawu, National Coordinator, NASCP

Mr. Segilola, Head of Planning Cell, NASCP

Dr. A. Mohammed, Focal Person for PMTCT, NASCP

Mrs. Nwaneri, Focal Person for VCT, NASCP

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Dr. I. M. Ibrahim, Executive Director

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Solidarity Center

Anthony Jones, Country Program Director

UNAIDS

Dr. Aldo Landi, Country Coordinator
Dr. Alti Zwandor

UNICEF

Dr. Abiola Davies, Project Officer HIV/AIDS

Annex B. Places Visited

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Anambra State Ministry of Health

Dr. J. Ijezie, State AIDS Programme Coordinator

Beacon Hospital & Maternity

Dr LE Anikpo, Medical Director

Charles Borromeo Hospital

Rev. Fr. F. Akamonye, Hospital Manager

Dr. CO Ojukwu, Focal Person

Delta Hospital & Maternity

Dr. D. Ifeakandu, Medical Director

Ifebi Medical Center

Dr. EO Ifebi, Medical Director

Regina Caeli Hospital

Dr. MI Chinwuba, Chief Medical Director

Sefton Specialist Medical Centre

Dr EC Emelumadu, Chief Medical Director

Silgrey Royal Hospital and Maternity Ltd.

Dr (Chief) SO Ikegwuonu, Chief Medical Director

Bauchi State

Aminchi Clinic

Dr Sani Adamu, Physician in Charge

Amsad Clinic

Dr Suleiman Mohammed, Physician in Charge

City Specialty Clinic

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Dr Tenebe, Assistant, Chief Medical Officer
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- Federal Ministry of Health, Nigeria. February 2003. "Distribution Plan for First Line ARVs for One Month."
- _____. May 2002. "National Guidelines For Voluntary Counseling And Testing (VCT) Services In Nigeria."
- _____. 2002. "Plan of Action for Broad Access to ARVs in Nigeria." FMOH Project Document.
- _____. August 2001. "National Guidelines on the Implementation of Prevention of Mother To Child Transmission of HIV Programme in Nigeria."
- _____. July 2001. "Guidelines for the Use of Antiretroviral Drugs in Nigeria." Project Document.
- Kombe, G, D. Galaty, and C. Nwagbara. 2004. *Scaling up Antiretroviral Treatment in the Public Sector in Nigeria: A Comprehensive Analysis of Resource Requirements*. Bethesda, MD: Partners for Health Reformplus, Abt Associates Inc.
- POLICY Project. March 2002. "HIV/AIDS in Nigeria – Overview of the Epidemic." Washington, DC: The Futures Group International.
- Population Reference Bureau. 2002. "World Population Data Sheet." Washington, DC.
- UNAIDS, World Health Organization, and UNICEF. 2002. *Epidemiological Fact Sheets on HIV/AIDS and Sexually Transmitted Infections, Nigeria. 2002 Update*. Geneva.
- World Bank. 2004. <http://www.worldbank.org/data/databytopic/GNPC.pdf>. Accessed August 2004.
- World Health Organization. 2004. http://www.who.int/GlobalAtlas/PDFFactory/HIV/EFS_PDFs/EFS2004NG.pdf. Accessed August 2004.