Access to Drugs for HIV/AIDS And Related Opportunistic Infections in Nigeria

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Access to Drugs for HIV/AIDS and Related Opportunistic Infections in Nigeria

A status report on the sociopolitical, economic, and policy climate on drug availability for People Living with HIV/AIDS (PLWHA) and recommendations for future access

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POLICY Project/Nigeria

The opinions expressed herein by the authors do not necessary represent any official position of the POLICY Project, its funders, or partners.

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List of Abbreviations

AAS	Atomic Absorption Spectrometry
ANC	Antenatal clinic
ARV	Antiretroviral
CMV	Cytomegalovirus
COCSGAEM	Coalition of Civil Society Groups on Access to Essential Medicines
CSW	Commercial sex workers
DOT-HAART	Directly Observed Therapy with Highly Active Antiretroviral Treatment
DOTS	Directly Observed Treatment Scheme
DFID	Department for International Development (UK)
DRF	Drug Revolving Fund
EDL	Essential Drug List
ELISA	Enzyme Linked Immunosorbent Assay
FCT	Federal Capital Territory
FMOH	Federal Ministry of Health
FHI	Family Health International
GC-ECD	Gas Chromatography with Electron Capture Detection
GC-MS	Gas Chromatography/Mass Spectrometry
GC-TSD	Gas Chromotography with Thermionic Specific Detection
GDP	Gross Domestic Product
GMP	Good Manufacturing Practices
HAART	Highly Active Antiretroviral Treatment
HEAP	HIV/AIDS Emergency Action Plan
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HMO	Health Management Organization
HPLC	High Performance Liquid Chromatography
IAP	Interim Action Plan (of HEAP)
IDA	International Dispensary Association
INRUD	International Network for Rational Use of Drug
IMF	International Monetary Fund
IPR	Intellectual Property Rights
IUATLD	International Union Against Tuberculosis and Lung Disease
LGA	Local Government Area
LUTH	Lagos University Teaching Hospital
MAC	Mycobacterium Avium Complex Infection
MTCT	Mother-to-Child Transmission
MDRTB	Multidrug Resistant Tuberculosis
MSF	Médecins Sans Frontières (Doctors without Borders)
MSH	Management Sciences for Health
NACA	National Action Committee on AIDS
NAFDAC	National Agency for Food, Drugs, Administration, and Control
NDLEA	National Drug Law Enforcement Agency
NDP	National Drug Policy

NGO	Nongovernmental Organizations
NHIS	National Health Insurance Scheme
NHP	National Health Policy
NIMR	Nigerian Institute for Medical Research
NIPRD	National Institute for Pharmaceutical Research and Development
NOIP	National Office of Industrial Property
NOTAP	National Office of Technology Acquisition and Promotion
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitor
NMR	Nuclear Magnetic Resonance
NRTI	Nucleoside Analogue Reverse Transcriptase Inhibitors
NTBLCP	National TB and Leprosy Control Program
OI	Opportunistic Infection
OTC	Over-the-Counter Drugs
UV and IR	Ultraviolet and Infrared
PCN	Pharmacists Council of Nigeria
PCP	Pneumocystis Carinii Pneumonia
PI	Protease Inhibitor
PSN	Pharmaceutical Society of Nigeria
PHC	Primary Health Care
PhRMA	Pharmaceutical Research and Manufacturers of America
PLWHA	People Living with HIV/AIDS
PPMVL	Patent and Proprietary Medicines Vendors License
PTF	Petroleum Trust Fund
R&D	Research and Development
RDS	Revised Drug Strategy (of the WHO)
SAP	Structural Adjustment Program
STI	Sexually Transmitted Infections
TB	Tuberculosis
TRIPS	Trade-related Aspects of Intellectual Property
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNAIDS	Joint United Nations Programme on AIDS
UNDCP	United Nations International Drug Control Programme
USAID	U.S. Agency for International Development
WHO	World Health Organization
WTO	World Trade Organization

1. Introduction

1.1 Executive Summary

This report was designed to characterize the legal, policy, and economic climate on the issue of access to drugs for HIV/AIDS and related opportunistic infections (OIs) in Nigeria. Local nongovernmental organizations (NGOs) and international organizations have produced information on drug availability and accessibility (especially by Médecins Sans Frontières (MSF) and the World Health Organization (WHO)). However, there has not been a comprehensive report on how the intersecting issues of health and drug policies, pharmacy laws, drug distribution, prescribing practices, research and manufacturing, and drug resistance impact drug accessibility.

The authors of this report have been researching and working with civil society organizations in Nigeria on the issue of access to drugs for HIV/AIDS. We conducted a number of meetings with many different institutions and organizations that are involved with drug quality, availability, and resistance. We also met with government officials/institutions that provided information dealing with legal and policy issues relating to drugs. Most of these meetings were confined to Lagos and Abuja and virtually no visits were made outside of these urban areas. We relied on current and existing statistical data from various professional organizations, the Internet, and libraries to assess information. Moreover, we consulted NGOs and people living with HIV/AIDS (PLWHA), both of whom provided data and documents and shared their experience with access to drugs in both urban and rural areas.

1.1.1 Organization of Report

This report provides an overview of the problem of HIV/AIDS in Nigeria. We describe the role and price of drugs in response to HIV/AIDS; factors that influence the availability of drugs, such as health care and drug policies; pharmacy and regulatory laws; trade-related Aspects of intellectual property (TRIPS); research and development (R&D); rational drug use and drug-treatment protocols; drug distribution; drug regulation and quality control; local drug manufacturing; and case studies that provide future models for HIV-related drug access. We provide recommendations on policy issues to improve regulatory apparatus and drug distribution and increase access to high-quality drugs. Some of these recommendations are based on other international experience that has seen success in accessing quality drugs. This report is meant to provide background assistance to the POLICY Project and its project partners.

1.1.2 Findings

Today, more than one-third of the world's population and more than one-half of the poorest people in Africa still lack access to essential drugs. According to the WHO, such access should cover therapeutic, physical, and financial aspects of priority health problems, and should be within easy physical and affordable reach to all.

The new political climate under the Obasanjo regime is open and recognizes the need for increased access to drugs for an HIV-infected population of 3.5 million. There is general recognition that access to drugs is one of the crucial components of "care and support" for PLWHA. However, gaining access to quality drugs for general health care and HIV-related OIs is difficult for the average Nigerian. Quality antiretroviral (ARV) medication for HIV/AIDS is accessible to less than 1 percent of those in need. However, the government's plan to provide broad access to generic ARVs is a positive and encouraging step. Overall, this report highlights problems to drug access and provides recommendations for short- and long-term drug access and sustainability. Below is the summary of findings.

1. *Policymaking*. Many good policies and laws pertaining to drugs and health care delivery have been instituted. In some cases, the policies are quite progressive and represent the position that drug and health care accessibility are fundamental human rights. The problem is that policies are inadequately implemented and laws rarely enforced. Institutions that are responsible for their implementation and enforcement are not adequately funded for such purposes. Some inadequate policies are currently under review, which provides a good opportunity for AIDS civil society organizations and others to participate in ways that make HIV/AIDS a priority in new health care and drug policies.

2. *Government communication and accountability*. There is a lack of communication among the three tiers of health care delivery as to the most important health and drug needs of communities. There exists a lack of data collection and exchange, which makes it difficult to track essential drug needs. There are institutional gaps between the federal level, which makes policy, and state/local levels, which implement policy. Part of the problem is that the Federal Ministry of Health (FMOH) is burdened by outdated and unsuitable civil service rules and has no clear statement on implementation and accountability. Overhauling the system rather than simply reforming it is probably the greatest challenge for health care delivery.

3. *Quality of drugs*. A large number of counterfeit drugs are in circulation (about 48 percent of all drugs available in Nigeria are substandard or fake), which can be found mostly in illegal pharmacies and marketplaces that many Nigerians patronize. In addition, there are many substandard drugs on the Nigerian market that are manufactured both locally and abroad. Some studies have linked the high rates of drug resistance and adverse effects to substandard and counterfeit drugs.

4. *Regulatory issues*. All the institutional needs of the drug regulatory system are in place. However, agencies and institutions responsible for drug regulation are not well funded; thus, they cannot carry out their mandates, such as inspection and quality assurance. In addition, enforcement mechanisms are not in place. The courts and police only require sensitization to drug regulatory issues.

5. *Drug distribution*. Drug distribution channels are dysfunctional and many are illegal. There are tens of thousands of illegal pharmacies and markets that are run by unqualified individuals without any form of control. The proliferation of these operations can be deterred, however, if the laws are properly implemented and enforced, which requires

adequate national budget allowances (with audits in place) for government institutions to do their work.

Even with treatment that is supposed to be free, such as for tuberculosis (TB) and malaria, drug supplies are often low or face an "out-of-stock" syndrome. There are measures that can be taken to ensure adequate supplies of drugs at all times, at least in urban areas. Other measures for rural areas are more difficult but not impossible to meet, especially with new government capacity-building agendas beginning to take shape.

Human and medical resources are inadequately distributed, particularly in rural areas, leading to a lack of institutional medical support, such as a general lack of pharmacists and pharmacies. Some states have fewer than 25 pharmacies to serve populations of one million or more. However, most states have virtually no pharmacies in the rural areas.

6. *Ability to pay for drugs*. The cost of ARV treatment and drugs for HIV-related OIs is out of reach for the majority of Nigerians. The average Nigerian monthly salary is N6,500 (about US$52). Currently, the cost of a proprietary triple HIV-drug cocktail can run up to thousands of U.S. dollars per year per patient. However, there are now several generic lines of ARVs and some OI drugs that are available at low cost (between $250–350 per year per patient) compared with brand names.

7. *Factors that impact drug prices*. The global intellectual property laws (particularly the World Trade Organization's (WTO's) TRIPS Agreement) currently favor the manufacture, pricing, and distribution monopolies of the global pharmaceutical industry. Drugs that are still on patent, for which no generic brands exist, are extremely expensive and out of reach for the average income-earning Nigerian. There is also little or no understanding in both government and NGO circles of how international pressures such as the TRIPS Agreement affect access to drugs. Government ministries and committees and NGOs need to comprehend how international laws and upcoming changes in Nigerian patent law will affect access to drugs for HIV/AIDS as well as for general health care. In addition, other factors drive up the cost of drugs, such as high taxes, markups, and currency exchanges, which have an impact on both imported and locally manufactured drugs. International partnerships, coordinated by UNAIDS, have negotiated significant proprietary drug price reductions; however, generics remain less expensive.

8. *Donated drugs and sustainability*. Currently, donated drugs are usually provided through the work of international organizations, such as MSF and the Netherlands Leprosy Relief, among others. Also, some local NGOs obtain drug supplies from outside the country. There are state-sponsored, free-treatment programs for TB and malaria; however, there is often a chronic "out-of-stock" syndrome of supplies, meaning that these programs are not always well sustained. Currently, the national government is embarking on a national ARV program, but lifetime sustainability of the drug supply for PLWHA is unclear. The Global Fund recently awarded Nigeria resources to stop mother-to-child transmission (MTCT) of HIV/AIDS as well as to help more fully integrate civil society into the national HIV/AIDS response and programming. In addition, Boeringer Ingelheim is donating Nevirapine, but long-term sustainability for the prevention of MTCT remains unclear.

9. *Local drug manufacturing*. The local drug-manufacturing sector is currently in decline. According to the National Drug Policy (NDP), locally manufactured drugs were expected to meet 80 percent of the nation's need by 2000. To date, it meets nearly 20 percent of the nation's health needs; the remaining 80 percent are imported. Likewise, raw materials are nearly 100 percent imported. Current drug manufacturing capacity is limited to the production of analgesics, antimalarials, antifungals, IV fluids, vitamins, and antibiotics. In Nigeria, there is virtually no communication between the private manufacturing sector and the public research sector on issues relating to research practices and the potential for commercialization of local research.

10. *Potential for reform and improved access to drugs*. Despite these obstacles, we do feel that based on other efforts worldwide and the current political climate in Nigeria that the problems of access to drugs could be overcome. If capacity is built as planned, a well-sustained and monitored government ARV program could prove successful. With generic triple-combination therapy now available, Nigeria's ARV program has the potential to increase openness and awareness, which could make access to drugs a safe endeavor as well. Other issues, such as drug distribution channels, regulatory problems, and counterfeits can be changed in the long-term with proper law enforcement measures in place. Some new policy changes need to be made on these latter issues. But most importantly, political and fiscal willingness is necessary for such overhauls.

1.2 Background on HIV/AIDS in Nigeria and Africa

The Human Immunodeficiency Virus (HIV) causes Acquired Immune Deficiency Syndrome (AIDS). HIV attacks the immune system, weakens it, and exposes the body to OIs—a variety of illnesses and cancers. Contracting several OIs (or one of a number of specific infections) often leads health care workers to suspect and test for HIV. If a patient is found to be HIV-positive, this can eventually lead to a diagnosis of AIDS.

According to the latest UNAIDS figures (UNAIDS, 2000), 36.1 million people worldwide are estimated to be living with HIV/AIDS: 1.4 million children under age 15 and 34.7 million adults, 16.4 million of whom are women. It is estimated that 70 percent (25.3 million) of all HIV/AIDS cases worldwide are in sub-Saharan Africa: 3.8 million new infections occurred in this part of the world in 2000. Of three million deaths due to HIV/AIDS during 2000, 2.4 million occurred in sub-Saharan Africa (UNAIDS, 2000).

The first case of HIV/AIDS in Nigeria was reported in 1986. In 1991, the FMOH conducted the first sentinel sero-prevalence survey in Nigeria. In this survey, and in subsequent surveys conducted in 1993, 1999, and 2001, populations selected to estimate HIV sero-prevalence were pregnant women attending antenatal clinics (ANCs), patients with sexually transmitted infections (STIs), patients with TB, and female commercial sex workers (CSWs).[1]

[1] There are few anonymous testing centers in Nigeria, and about 70–80 percent of the population seeks traditional health care services as their primary health care. Therefore, populations selected for HIV demographic surveys are those that have at least some or limited hospital and clinic access, which leaves out a larger portion of the more impoverished social classes.

These surveys show a rise in HIV infection in Nigeria: from 1.8 percent in 1991 to 3.8 percent in 1995, to 5.4 percent in 1999, and 5.8 percent in 2001. These figures indicate that about 3.5 million Nigerians between the ages of 15–49 are infected with HIV (National AIDS/STD Control Programme/FMOH, 2001).

HIV infection rates vary across communities and states. Within every geopolitical zone in Nigeria, there exist "HIV hotspot" states where HIV prevalence rates are much higher than the national average. According to National AIDS/STD Control Programme/FMOH (2001), 10 of 85 sites studied returned results of HIV prevalence above 10 percent (see Table 1). Moreover, HIV infection among youth is growing perhaps more rapidly than among any other age group nationally, currently running highest among individuals age 20–24 (see Table 2).

The main mode of HIV transmission in Nigeria, as it is in the rest of sub-Saharan Africa, is heterosexual contact. There are many factors that contribute to increasing rates of HIV in Nigeria, such as poverty, gender disempowerment, social and financial inequality, STIs, social and religious norms, and political and social changes (e.g., labor migration and ignorance). Vulnerable groups cited by FHI (2000) include sex workers, truck drivers, businessmen, port and dockworkers, blood transfusion recipients, youth, TB and STI patients, children (due to MTCT), and orphans. With the lack of economic empowerment of women and a thriving "sugar daddy" culture, married men/couples in Nigeria should perhaps be considered just as vulnerable.

Table 1. HIV Prevalence Rates by State

State	HIV Prevalence (1999)	Estimated HIV Infection	HIV Prevalence (2001)	Estimated HIV Infection
Abia	3.0	50,237	3.3	34,335
Adamawa	5.0	56,510	4.5	57,149
Akwa Ibom	12.5	172,590	10.7	122,169
Anambra	6.0	106,721	6.5	134,325
Bauchi	3.0	26,468	6.8	114,288
Bayelsa	4.3	17,675	7.2	49,935
Benue	16.8	279,466	13.5	245,066
Borno	4.5	67,633	4.5	62,140
Cross River	5.8	61,152	8.0	93,582
Delta	4.2	61,141	5.8	125,842
Ebonyi	9.3	68,015	6.2	51,901
Edo	5.9	69,772	5.7	54,828
Ekiti	2.2	15,132	3.2	31,326
Enugu	4.7	52,170	5.2	51,639
FCT	7.2	17,044	10.2	7,127
Gombe	4.7	39,860	8.2	103,620
Imo	7.8	73,305	4.3	79,865
Jigawa	1.7	29,387	1.8	47,043
Kaduna	11.6	151,007	5.6	199,723
Kano	4.3	126,056	3.8	299,197
Katsina	2.3	63,075	3.5	76,544
Kebbi	3.7	42,811	4.0	56,884
Kogi	5.2	79,053	5.7	88,385
Kwara	3.2	29,229	4.3	45,779
Lagos	6.7	226,674	3.5	70,171
Nasawara	10.8	63,077	8.1	49,275
Niger	6.7	72,496	4.5	55,383
Ogun	2.5	33,374	3.5	58,480
Ondo	2.9	34,164	6.7	92,875
Osun	3.7	39,462	4.3	52,125
Oyo	3.5	65,591	4.2	79,561
Plateau	6.1	63,662	8.5	82,076
Rivers	3.3	90,805	7.7	163,233
Sokoto	2.7	45,505	2.8	45,229
Taraba	5.5	38,773	6.2	60,460
Yobe	1.9	7,160	3.5	24,280
Zamfara	2.7	38,877	3.5	32,162

Source: National AIDS/STD Control Programme/FMOH, 1999; 2001

Table 2. HIV Prevalence Rates by Region, Youth, and Hot Spots

Geopolitical Zone	Median HIV Sero-prevalence (%)	Hot Spot State and Median HIV Sero-prevalence (%)	Sero-prevalence Rate Among Youth in Zone (20–24) (%)	Prevalence Rate Among ANC Attendees in Hot Spot State (%)
South East	5.2	Ebonyi (9.3)	8.4	11.1
South West	3.5	Lagos (6.7)	4.2	4.7
North West	3.2	Kaduna (11.6)	4.5	15.0
North Central	7.0	Benue (16.8)	9.5	21.0
North East	4.5	Taraba (5.5)	3.6	7.0
South South	5.2	Akwa Ibom (12.5)	6.8	13.3

Source: National AIDS/STD Control Progamme/FMOH, 1999

OIs in HIV-positive individuals are the products of two factors: an individual's lack of immune defenses caused by the virus and the presence of microbes and other pathogens in the environment. Tables 3 and 4 show global and Nigerian frequencies of OIs. Common OIs include

- Bacterial diseases, such as TB, mycobacterium avium complex (MAC) disease, bacterial pneumonia, and septicaemia
- Protozoal diseases, such as PCP
- Fungal diseases, such as candidiasis, cryptococcosis, and penicilliosis
- Viral diseases, such as herpes
- HIV associated malignancies, such as Kaposi sarcoma

Table 3. Global Frequency Rates of HIV-related OIs and Malignancies

Disease	Frequency (%)
Oral candidiasis	53
PCP	24
Tuberculosis	22
Oesophageal candidiasis	21
Cytomegalovirus (CMV) disease	21
Kaposi sarcoma	15
Toxoplasmosis	11
Cryptococcosis	9
Cryptosporidiosis	8
Herpes zoster	7
Systemic herpes simplex	7
Mycobacterium avium complex infection	4
Salmonella septicaemia	4
Histoplasmosis	4

Source: WHO, 1997b

Note: Aspergillosis, isosporiasis, nocardiosis, leishmaniasis, and penicillinosis were also reported and on average had a rate of less than 4 percent.

Table 4. Most Common Symptoms/OIs in Nigeria

Symptoms	% of Patients
Prolonged Fever	73.12
Chronic diarrhea	53.05
Chronic cough	50.19
TB*	15.15
Dermatitis	25.03
Lymphadenopathy	39.92
Herpes Zoster	9.88
Genital ulcers	8.03
Candidiasis	6.58

Source: Akinsette, 1998
*43% according to Idigbe et al., 2000

Little impact has been made in combating the HIV/AIDS epidemic in Nigeria because of the long-term, unstable political climate; lack of political will, commitment, and involvement by past administrations; lack of a coordinated multisectoral approach against the epidemic; over-centralized intervention programs; competing priorities with other development needs; and poor resource allocation to HIV/AIDS interventions. Many families affected by AIDS must sell their assets and consume a less nutritional diet. As a result of diminished financial resources, families are increasingly withdrawing their children from school in order to cope with the impact of the disease. Poverty exacerbates the conditions for the spread of HIV/AIDS. The impact of poverty on women drives them to adopt coping mechanisms that may include increased risk exposure (e.g., sex work). Poverty also limits the scope for long-term development prospects, thereby reducing the barriers for taking otherwise unacceptable risks.

HIV/AIDS is a significant threat to Nigeria's development. The country has already surpassed the 5 percent explosive phase; thus far, the epidemic has killed 1.7 million people and orphaned 1.5 million children. Today, 3.5 million Nigerians are living with the virus. By the experience of countries that have surpassed the Nigerian HIV prevalence rate (5.8%), HIV/AIDS in all likelihood will pose a significant burden on the already stressed and depleted resources and dilapidated infrastructure available to fight the disease.

1.3 Role of Drugs for HIV/AIDS

The classes of drugs most important to PLWHA are

- Anti-infective agents to treat or prevent OIs;
- Anti-cancer drugs to treat malignancies, such as Kaposi sarcoma and lymphoma;
- Palliative drugs to relieve pain and discomfort, both physical and mental; and
- ARVs to limit the damage that HIV does to the immune system by reducing viral load.

As HIV/AIDS is quite recent to medical history, many drugs created specifically to treat HIV infection and its related diseases are proprietary and, therefore, expensive. However, many generic brands are becoming more available on the global market, a situation which presents

greater viable purchasing options for low-income countries such as Nigeria. Therefore, determining which drugs are important for HIV and HIV-related treatment depends on price and availability as well as legal issues (discussed in section 2.3).

Based on extensive field research, MSF asserts that the priority medicines for resource-poor settings are

1. Drugs for the prevention of OIs, particularly isoniazide and cotrimoxazole, which are recommended by WHO/UNAIDS;
2. Palliative drugs, such as analgesics and antidiarrheals, which have been shown to improve the well-being of patients;
3. ARVs, which can act as preventatives of OIs and help to extend and improve the quality of life by reducing viral load; and
4. ARVs, such as AZT and NVP, which can prevent MTCT and be used as post-exposure prophylaxis (Pérez-Casas and Boulet, 2000a).

Drugs excluded from the priority list include

1. Those that are too complex to administer and monitor by untrained staff or have limited efficacy. These criteria exclude drugs used for atypical mycobacteria, CMV, Kaposi sarcoma, lymphoma treatment drugs, and protease inhibitors (PIs).
2. "Third-line" drug choices (e.g., pentamidine) in which first- and second-line drugs are included and expected to be effective in the vast majority of cases (Pérez-Casas and Boulet, 2000a).

1.3.1 Medicines for OIs

Tables 5–7 provide a brief look at sample drugs for OIs that offer significant benefits to PLWHA (for drug prices and availability of ARV and OI drugs in Nigeria, see Tables 11–15, pp. 14–19). Table 5 lists anti-infective drugs most in demand to treat or prevent opportunistic diseases. Almost one-half are proprietary, with prices as high as several thousand U.S. dollars per year for treatment or prophylaxis; also, many are not widely available in developing countries. In addition, some are both difficult to administer and monitor (i.e., they require highly trained medical staff or expensive equipment). Table 6 lists anti-cancer drugs used to treat two of the most frequent malignancies in PLWHA: Kaposi sarcoma and lymphoma. Although generics exist, availability is low. Table 7 lists palliative drugs needed to relieve pain and discomfort, both physical and mental, and other symptoms in PLWHA. Even though most of the symptoms listed can be treated or alleviated with essential drugs, access to palliative care is hampered by limited availability of major analgesics (e.g., codeine, morphine, and pethidine). In addition, some inexpensive and effective palliative drugs are classed as illegal narcotics and thus are not listed, even if the palliative benefits at a late stage of disease outweigh the risk of addiction.

Table 5. Anti-infective Agents Frequently Needed by PLWHA

Indication	Drug	Indication	Drug
CMV	Ganciclovir IV	*PCP*	Pentamidine
	IV prophylaxis		Trimethoprim-sulfamethoxazole concentrate for IV administration
	Oral prophylaxis	*Systemic mycosis*	Itraconazole
	Cidofovir IV (alternative to ganciclovir)		Fluconazole
	Cidofovir (prophylaxis)		Amphothericin B
	Foscarnet IV treatment (alternative to ganciclovir)	*Thrush*	Ketoconazole tablet (PO)
Herpes zoster	Aciclovir 800mg/day oral		Miconazole gel (PO)
Extensive herpes simplex injection	Aciclovir 800mg/day		Nystatin suspension
	Foscarnet (alternative to aciclovir for prophylaxis)		Nystatin tablet (PO)
MAC infection	Azithromycin	*Toxoplasmosis*	Clindamycin
	Clarithromycin		Sulfadiazine tablets
	Rifabutin	*TB*	Isoniazid 300mg/tablet (prophylaxis)
Microsporidiosis	Albendazole		Anti-TB drugs treatment course

Source: MSH, 2000
Note: Proprietary drugs as listed in British Hospital Formulary.

Table 6. Anti-cancer Drugs Frequently Needed by PLWHA

Indication	Drug
Kaposi sarcoma	Adriamycine (injectable)
	Bleomycin (injectable)
	Vinblastine (injectable)
	Vincristine (injectable)
Lymphoma	Methotrexate

Source: MSH, 2000
Note: Proprietary drugs as listed in British Hospital Formulary.

Table 7. Drugs for Palliative Care Frequently Needed by PLWHA

Indication/Symptom	Drug	Indication/Symptom	Drug
Allergy, anxiety, itching	Promethazine injection	*Hypersecretion*	Anticholinergics (e.g., atropine ampoule)
	(treatment with promethazine suspension antihistaminics)	*Itching skin rash*	Calamine lotion
	chlorpheniramine tablet		Nausea
	chlorpheniramine injection		Anti-nausea products (e.g., meclopramide)
Anxiety, convulsions	Diazepam, oral and injection	*Pain, cough, diarrhea*	Codeine 30mg tablet
Convulsions	Sodium valproate 200mg/tablet	*Severe anxiety, psychosis, intractable hiccups (treatment with neuroleptics)*	Chlorpromazine 100mg Haloperidol, 1.5-2.0mg tablet
Depression (treatment with anti-depressants)	Amitryptiline 25mg tablet	*Severe pain*	Pethidine 50mg ampoule (oral and injection)
	Amitryptiline 10mg tablet		Morphine
Diarrhea	Loperamide 2mg tablet		Oral solution 10mg/5ml
Drug addiction	Methadone		Injection 10mg/1ml ampoule
Epilepsy, convulsions	Carbamazepine		

Source: MSH, 2000

1.3.2 ARV Drugs

There are three main types of ARV drugs: nucleoside analogue reverse transcriptase inhibitors (NRTIs), PIs, and nonnucleoside reverse transcriptase inhibitors (NNRTIs). NRTIs target an HIV protein called reverse transcriptase. These were the first type of drugs available to treat HIV. Today, two NRTIs often form the backbone of any anti-HIV drug combination. Common dual combinations of NRTIs that are used as part of combination therapy are

- d4T and ddI
- AZT and 3TC
- d4T and 3TC
- AZT and ddI

Combinations that are avoided are

- AZT and d4T
- d4T and ddC
- ddI and ddC

PIs were the second class of ARV drugs made available. They are usually used in combination with two NNRTIs. Often in capsule form, these pills can be heat sensitive and daily doses can include anything from four to 16 pills. PIs are not usually recommended as the first line of ARV treatment in resource-poor settings.

An NNRTI is often taken with two NRTIs as an alternative to a PI. A daily dose may involve one to four pills. NNRTIs are increasingly viewed as a preferred first-line treatment, particularly for people in developing countries. Name-brand proprietary ARVs are shown in Tables 8-10 below. (Generic ARVs with prices are listed in Table 13, p. 18).

Table 8. List of NRTIs

Drug	Manufacturing Company
AZT, zidovudine (Retrovir)	Glaxo Smith Kline
ddI, didanosine, (Videx)	Bristol Myers Squibb
ddC, zalcitabine (Hivid)	Roche
3TC, lamivudine (Epivir)	Glaxo Smith Kline
d4T, stavudine (Zerit)	Bristol Myers Squibb
abacavir (Ziagen)	Glaxo Smith Kline
Combined pill of AZT and 3TC (Combivir)	Glaxo Smith Kline
Combined pill of AZT, 3TC, and abacavir (Trizivir)	Glaxo Smith Kline

Source: UNAIDS/Nigeria, 2001

Table 9. List of PIs

Drug	Manufacturing Company
Indinavir (Crixivan)	Merck
Saquinavir (Fortovase)	Roche
Ritonavir (Norvir)	Abbott
Nelfinavir (Viracept)	Agouron in the U.S., Roche in the rest of the world
Amprenavir (Agenerase)	Glaxo Smith Kline
Combined pill of ritonavir and lopinavir (Kaletra)	Abbott

Source: UNAIDS/Nigeria, 2001

Table 10. List of NNRTIs

Drug	Manufacturing Company
Nevirapine (Viramune)*	Boehringer Ingelheim
Efavirenz (Sustiva)	Du Pont in the U.S., Stocrin–Merck in the rest of the world
Delavirdine (Rescriptor)	Pharmacia and Upjohn

Source: UNAIDS/Nigeria, 2001
*also used in the prevention of MTCTs

1.4 Pricing and Availability of HIV and OI Drugs in Nigeria

MSF conducted a survey from April–June 2001 in Lagos on behalf of the Coalition of Civil Society Groups on Access to Essential Medicines (COCSGAEM), composed of 21 NGOs (MSF/COCSGAEM, 2001). The survey was done in order to provide information on the availability and affordability of some of the ARV and OI medicines in the Lagos area. Public and private hospitals, community pharmacies, and drug companies were visited. The drugs selected for the survey included the following:

- *ARVs:* delarvidine, zidovudine (AZT), efavirenz, indinavir, idanosine (ddI), saquinavir, nelfinavir, stavudine, nevirapine, ritonavir, lamivudine, zalcitabine, AZT/3TC combination
- *Antibiotics:* amoxycillin/clavulanate, ciprofloxacine, cotrimoxazole, ceftriaxone, azithromicine antifungals: fluconazole, ketoconazole, amphotericine B, itraconazole
- *Anti-TB:* isoniazide, rifampicin, pyrazinamide
- *Others:* tramadol, ivermectine, acyclovir, dapsone, albendazole

Of a total of 13 ARVs included in the survey, only six—zidovudine, AZT/3TC, lamivudine, sequinavir, zalcitabine, and nelfinavir—were available in Lagos State.

MSF reported that there was generally little stock of these in the facilities visited. Drugs that are expensive are deliberately not kept in stock because of low demand and are purchased only on request. Patients are often sent directly to the pharmaceutical companies to purchase those drugs.

1.4.1 ARV Medicines

Only three ARV drugs were found in four of 14 health structures (selected sites included private pharmacies, private hospitals, and the open market). In the open market, although there were many sellers, there was only one place where ARVs were available. Prices are obviously unaffordable for the majority of Nigerians (minimum salary per month in Nigeria is N6,500, or US$52). Table 11 provides an average price for each item and notes that there is significant markup in private pharmacies, hospitals, and the marketplace. (Note: generic drugs were not available at the time of this survey.)

Table 11. Average Price for Selected Drugs in Nigeria

Drugs	Private Pharmacy	Private Hospital	Pharmaceutical Company	Market
AZT 100mg tab (Glaxo, except g:Apotex)	4.82	1.46-2	0.86g-0.24-1.19	
AZT syrup 50mg/5ml, 200ml (Glaxo)	114.04		70	
Lamivudine 150mg tab (Glaxo)	3.65	1.32	0.3*	1.75
Nelfinavir 250mg (Roche)		2.90	1.63	
Saquinavir 200mg (Roche)			0.80	
Stavudine 40mg (BMS)				1.17
Zidovudine 300mg-lamivudine 150mg (Glaxo)			0.94	3.80
Zalcitabine 0.75mg (Roche)		2.50	1.48	

Source: MSF/COCSGAEM, 2001

Note: Prices indicated in the "Pharmaceutical Companies" column are the institutional prices sold at hospitals and pharmacies. The first three items (AZT tablet, AZT syrup, and lamivudine) were available in private pharmacies that import them from the United States; the rest was purchased directly in Nigeria through subsidiaries.

Tables 12 and 13 compare proprietary and generic drug prices. Table 12 lists current ARV proprietary company prices (with CIPLA, a generic company) in Nigeria compared to South Africa. Table 13 lists generic brand comparisons.

Table 12. Prices of ARVs for Treatment of HIV/AIDS

Product name	*Generic name*	*Strength*	*Form*	*Pack size*	*S. Africa price (US$)/ Feb. 2002*	*CIPLA*	*Nigeria private sector, Naira*	*Private sector (US$)*	*S. Africa price/year*	*CIPLA/year*	*Nigeria private sector*
Glaxzowellcome											
RETROVIR	Zidovudine (AZT)	100mg	CAP	100	32.06		13,500	100.00			1,200
RETROVIR	Zidovudine (AZT)	250mg	CAP	60	48.09						
RETROVIR	Zidovudine (AZT)	300mg	TAB	60	57.71				692.47		
RETROVIR S SYRUP	Zidovudine (AZT)	50mg/5ml	SYR	200ml	12.45	3.00					
RETROVIR IVI	Zidovudine (AZT)	200mg/ 20ml	INF	5	28.30	275.00					
RETROVIR/ 3TC STARTER	Zidovudine+ Lamuvidine	100mg+15 0mg	TAB	18 + 3	16.85						
3TC	Lamuvidine	150mg	TAB	60	63.44		18,500	137.04	761.32		1,644.44
3TC	Lamuvidine	10mg/ml	SYR	240ml	23.30	3.60					
COMBIVIR	Zidovudine+ Lamuvidine	300mg + 150mg	TAB	60	79.30		34,000	251.85	951.65		3,022.22
TRIZIVIR	AZT+3TC+ Abacavir		TAB				36,000	266.67			3,200
Bristol–Myers Squibb											
VIDEX	Didanosine (ddI)	150mg	TAB	60	15.92						
VIDEX	Didanosine (ddI)	100mg	TAB	60	15.92	10.00			191.03	120.00	
VIDEX	Didanosine (ddI)	50mg	TAB	60	15.92						
VIDEX	Didanosine (ddI)	25mg	TAB	60	15.92						
VIDEX	Didanosine (ddI)	4g	SUSP	200ml	-						
VIDEX	Didanosine (ddI)	2g	SUSP	200ml	15.92						
ZERIT	Stavudine (d4T)	40mg	CAP	60	5.62				67.44		
ZERIT	Stavudine (d4T)	30mg	CAP	60	5.62				67.44		
ZERIT	Stavudine (d4T)	20mg	CAP	60	5.62						
ZERIT	Stavudine (d4T)	15mg	CAP	60	5.62						
ZERIT	Stavudine (d4T)	1mg/ml	SYR	200ml	9.36						

Product name	*Generic name*	*Strength*	*Form*	*Pack size*	*S. Africa price (US$)/ Feb. 2002*	*CIPLA*	*Nigeria private sector, Naira*	*Private sector (USD)*	*S. Africa price/year*	*CIPLA/ year*	*Nigeria privatesector*
Roche											
HIVID COMBO PACK	Zalcitabine +?	0.75mg + 0.375mg	TAB	100 + 100	78.81						
HIVID	Zalcitabine						24,000	177.78			2,133.33
VIRA-CEPT	Nelfinavir	250mg	TAB	270	196.28	135.00	52,000	385.19	2,355.34	1,620.00	4,622.22
VIRA-CEPT	Nelfinavir	50mg/g	POW	144g	24.98						
FORTO-VASE	Saquinavir	200mg	CAP	180	54.52				654.26		
INVA-RASE	Saquinavir	200mg	CAP	270	182.40				2,188.80		
MSD											
CRIXIVAN	Indinavir	400mg	TAB	18	3.84						
CRIXIVAN	Indinavir	400mg	TAB	180	38.39	70.00			460.73	840.00	
STOCRIN	Efavirenz	200mg	TAB	90	32.07	40.00			384.89	480.00	
Abbott											
NORVIR	Ritonavir	100mg	CAP	84	10.38				124.61		
NORVIR	Ritonavir	400mg/5ml	SYR	90ml	8.89						
KALETRA		133.3mg/ 33.3mg	CAP	180	-						
KALETRA		500mg/5ml	SLN	180							
KALETRA		500mg/5ml	SLN	5x60ml							
Boehringer Ingelheim											
VIRAMUNE	Nevirapine	200mg	TAB	60	35.69				428.24		
VIRAMUNE	Nevirapine	50mg/5ml	SYR	240ml	19.83	6.00					

All prices are the ex-manufacturer price and include VAT

									indiv drugs S. Africa	*Scomb CIPLA*	
Lamuvidine 150, Stavudine 30, Nevirapine 200mg			TAB	60	n/a	29.16			1,257.01	349.92	
Lamuvidine 150, Stavudine 40, Nevirapine 200mg			TAB	60	n/a	29.16			1,257.01	349.92	
Zidovudine 300, Lamuvidine 150, Nevirapine 200mg			TAB	60	n/a	36.00			1,379.90	432.00	

Source: Bannenberg, 2002

Table 13. Generic Drug Prices Offered to Nigeria (in US$)

Company	Lamivudine 150mg	Nelfinavir 250 mg	Saquinavir 200mg	Zalcitabine 0.75 mg	Zidovudine 100 mg	ZDV+ 3TC 300-150mg	(d4T 30-40mg+3TC150mg+ Navirapine 200mg)
Hetero (India)	0.13	0.68	0.45	0.04			
Aurobindo (India)	0.12	0.89	0.75		0.08	0.37	
Glaxo (Nigeria)	0.3				0.24	0.94	
Thai Pharma Organization							1.8
Ranbaxy (India)						0.8	

Source:MSF/COCSGAEM, 2001; UNICEF et al., 2002.

Notes: (1) CIPLA and Ranbaxy are in the process of registering their drugs in Nigeria.
(2) WHO recently endorsed generic ARVs in resource-poor treatment countries (Akanni, 2002).

1.4.2 Medicines for OIs

In MSF/COCSGAEM (2001), OI medicines were more available than ARVs (see Table 14). They were also easier to find in governmental entities as well as in pharmacies. Table 15 shows drugs needed for additional OIs that were, on investigation, found to be generally unavailable and unaffordable.

Table 14. Cost of OI Treatment in Nigeria

	Minimum Price	Treatment Period (days)	Dosage	Treatment Cost ($)
Co-amoxiclav 375mg, tab	0.29g–0.97	7–14 days	2tds	12.18g–24.36g 40.74–81.48
Ceftriaxone 1g, inj.	11.84g–25.35	7 days	1g–4g/day	82.88g–331.52g 177.45–709.8
Ceftriaxone 250 inj.	4.61g–8.42			
Azithromycine 250mg, tab	2.2–7.6	6 weeks (long term)	1od	66–228
Ciprofloxacin 250, tab	0.21g–1.6	7–14 days	2bd	5.88g–11.76g 44.8–89.6
Ciprofloxacine 200mg/100ml inj	3.32g			
Co-trimoxazole 480mg, tab	0.1g–0.23	14–21 days	2bd or 3tds	24.64g–83.16g 12.88–43.47
Rifampicine 300mg, tab	0.05g–0.13g	6 months	2/day	18–46.8
Pyrazinamide 500mg, tab	0.09g–0.14	2 months	4/day	21.6–33.6
Albendazole 200mg	0.35–0.66			
Fluconazole 50mg, tab	3.68–4.09	7 days 8 weeks	od 8/day	25.76–28.63 1,648.64–1,832.32
Itraconazole 100mg, tab	2.87–4.47	7 days 8 weeks	1bd 4/day	40.18–62.58 642.88–1,001.28
Ketoconazole 200mg, tab	0.56–0.75	14 days	od	7.84–10.5
Acyclovir 200mg, tab	0.21g–1.6	5–10 days	1, 4–5 times	10.5g–29.4g 80–224
Metronidazole 200mg, tab	0.02–0.03	7 days	2tds	0.84–1.26

Source: MSF/COCSGAEM, 2001
Note: g=generic

Table 15. Status of Other Drugs for OIs Sold in Lagos that are Useful for Treating OIs

Indication	Drug	Status
CMV	Ganciclovir IV Cidofovir IV Foscarnet IV	Unavailable, unaffordable
Extensive herpes simplex	Foscanet	Unavailable, unaffordable
MAC	Rifabutin	Unavailable, unaffordable
PCP	Pentamidine Trmethoprim-sulfamethoxazole IV	Unavailable, unaffordable

Source: MSF/COCSGAEM, 2001
Note: These drugs are for serious indications and are still under patent. No generics are available except for drugs treating PCP.

Recommendations

1. Government has already begun to purchase generic medicines. Drug stock should be monitored, including expiration date, price, patent status, and drug needs based on best treatment guidelines.

2. Long-term government subvention of ARVs needs to be assessed.

3. Because generics are becoming more available, government needs to consider measures to keep ARV and OI generic drugs tightly controlled, distributed, and monitored. In addition, measures for quality control need to be considered.

4. Consider massive public education campaigns, on medical practitioner supervision, the misuses of ARV, and the possibilities of resistance, preferably before Ranbaxy and CIPLA complete product registration with the National Agency for Food, Drugs, Administration, and Control (NAFDAC).

5. Consider the use and effectiveness of traditional medicines for palliative care and anti-infective agents.

2. Factors Influencing the Accessibility of HIV/AIDS-related Drugs in Nigeria

2.1 Factors Contributing to and/or Influencing Drug Prices in Nigeria

This section discusses the number of external factors that determine drug prices, such as the global market, competition, taxes, and international drug negotiations.

1. *Global pharmaceutical industry*. Pharmaceutical companies claim that high prices are necessary to fund R&D. However, public funding (especially in the United States) often supports government research; and once that research is completed, the government sometimes turns patents over to private industry for manufacturing and marketing. The Pharmaceutical Research and Manufacturers of America (PhRMA), an industry lobby group, estimates that private industry finances 43 percent of drug development (other studies by Oxfam report 20 percent). HAI-Europe (1999a) reports that U.S. drug companies spent US$1.2 billion on direct-to-consumer advertising in 1998, and Atueyi (1999) reports that 15–20 percent is spent on promotion and advertising. Besides R&D, long time-to-approval is another justification cited by industry for high prices. However, ARVs have the shortest time-to-approval of any class of drugs: a mean of 44.6 months, one-half the industry average of 87.4 months (Peréz-Casas and Boulet, 2000a). The cost of clinical trials for these drugs is further reduced by heavy government sponsorship. The U.S. government funded more than one-third of patients enrolled in U.S. trials for 14 different AIDS drugs (Peréz-Casas and Boulet, 2000a). Other costs included (and subtracted) are ongoing R&D, marketing, subsidies, tariffs, and taxes.

   A great deal of debate about the real cost of successfully bringing drugs to market is evident, and little first-hand data are available in the public domain. Despite the various claims of cost, ARVs have earned significant revenue for the pharmaceutical industry. Between 1997 and 1999, Glaxo Wellcome's sales of AZT, 3TC, and Combivir totaled more than US$3.8 billion. Bristol–Myers Squibb sold more than US$2 billion worth of d4T and ddI in the same period (Peréz-Casas and Boulet, 2000a).

2. *Monopoly rights.* Multinational drug companies have favorable marketing, pricing, and distribution rights via the TRIPS Agreement. As such, they tend to demand maximum possible prices, catering to country elites and leaving the purchase of drugs out of reach for the vast majority of people living in developing countries.

3. *Generic production*. The presence or absence of generic competition in the open market is a key determinant of pricing levels. Competition brings down prices dramatically. For example, fluconazole is not patented in Thailand. Before fluconazole was produced as a generic in 1998, Pfizer sold it for US$7 per 200mg capsule. Then, three Thai companies began production and Pfizer dropped its price to US$3.6, even though generic companies were charging much less (Biolab was charging US$0.6). After initially responding to generic competition, Pfizer increased its price in Thailand to US$6.2 in March 2000, while Biolab's price decreased its price to US$0.3 (20.7 times cheaper than Pfizer's price). Multinational

companies have had to contend with similar competition from CIPLA in India. Glaxo Wellcome's lamivudine (3TC) 150mg tablet costs 78 percent less in India than in the United States. Brazil generically manufactures a great deal of its ARV drug supply, which is sold at a fraction of the price globally. A generic form of zidovudine is 14 times cheaper in Brazil than in the United States (Peréz-Casas and Boulet, 2000a).

4. *Cost-drivers, tariffs, and taxation.* In addition to multinational monopoly pricing regimes, costs within a country make essential drugs even more out of reach for Nigerians. The executive secretary of the Nigerian Pharmaceutical Group, Kunle Okelola, noted that the following add-ons create substantially higher drug costs:

   - Shipping and handling usually is about 20–30 percent of the drug price.
   - Additional costs exist for shipping to health facilities (inland transportation cost).
   - Taxes paid on imported drugs are 25 percent.
   - Imported raw materials are 5 percent.
   - There should be no value-added tax (VAT) on pharmaceuticals; however, some are still made to pay 5 percent (a cost that is now in the process of being eliminated).
   - Prices are marked up by manufacturers, importers, suppliers, and retailers to ensure profits for everyone.
   - There is no excise duty on locally made products (Ikoro, 2001).

5. *Differential pricing*. Comparing prices between countries is inherently difficult because of the problem of comparing official exchange rates and real currency values; differences in pharmaceutical distribution channels (private versus public sector, retail versus wholesale); different strengths and pharmaceutical dosages; price fluctuations overtime, and so forth. However, companies often price the same drugs in different countries at different prices. Tables 16 and 17 show different pricing examples among the United Kingdom (UK), Spain, and Nigeria. In some cases, imported drugs to Nigeria are higher in price than in Spain.

Table 16. Differential Pricing Among the UK, Spain, and Nigeria

Drug	UK	Spain	Nigeria
Zidovudine 100mg, tab	1.68	0.47	[1.46–4.82]
Zidovudine 250mg, tab	4.2	1.18	0.56
Zidovudine 300mg, tab	5.03	1.41	0.69
ZDV/3TC, 300–150mg, tab	8.03	3.59	3.8
Lamivudine 150mg, tab	3.83	1.96	[1.32–3,65]
Saquinavir 200mg, tab	0.78	0.75	0.8
Zalcitabine 0.75mg, tab	2.13	1.12	[1.48–2.64]
Nelfinavir 250mg, tab	1.51	0.81	[1.63–3.06]

Sources: UNICEF et al., 2000; MSF/COCSGAEM, 2001

Table 17. Comparison of OI Drug Pricing among the UK, Spain, and Nigeria

Drug	UK	Spain	Nigeria
Fluconazole 200mg, tab	13.35	5.92	**3.8**
Itraconazole 100mg, tab	2.01	**0.88**	3.67
Ketoconazole 200mg, tab	0.74	**0.27**	0.65
Ceftriaxone 250mg, inj.	3.85	**2.14**	6.3

Sources: UNICEF et al., 2000; MSF/COCSGAEM, 2001
Note: Prices indicated in US$, per unit; lowest prices are in bold.

6. *Internationally coordinated programs*. Vaccine and contraceptive procurement has been successful when international organizations, national governments, and pharmaceutical companies work together to meet priority health concerns (oral contraceptive prices are 130–240 times cheaper in poor countries than in the United States). There is a current UNAIDS initiative on pharmaceutical pricing reductions with five pharmaceutical companies. To date, nine countries—Burundi, Cameroon, Côte d'Ivoire, Gabon, Mali, Morocco, Rwanda, Senegal, and Uganda—have reached agreements with four research-based pharmaceutical companies to provide ARVs at significantly reduced prices. In addition, five pharmaceutical companies (Boehringer Ingelheim, Bristol–Myers Squibb, GlaxoSmithKline, Hoffman LaRoche, and Merck) and the WHO, World Bank, UNICEF, UNFPA, and UNAIDS, under the Accelerated Access Initiative, are exploring ways of speeding up access to HIV/AIDS treatment in developing countries via negotiating price reductions. For example, Bristol–Myers says that as part of its new proposal it will sell Zerit and Videx for a combined price of $1 a day, or $365 a year. However, these two drugs must still be combined with a third to complete the AIDS regimen. Merck's new reduced price for Crixivan is $600 a year, and its new price for Stocrin is $500 a year. Adding either of those drugs to Bristol–Myers's two medicines brings the annual price of a three-drug regimen in Africa to about $865–965 per year. These are indeed significant price reductions; however, given that the average yearly salary in Nigeria is US$624, these newly reduced prices may remain far beyond the economic reach of most Nigerians. Table 18 shows drug prices by situational comparisons, including prices for Senegal, which were negotiated under the Accelerated Access Initiative.

Table 18. Drug Prices by Situational Comparisons*

	Lamivudine 150mg	Nelfinavir 250mg	Saquinavir 200mg	Stavudine 40mg	Zalcitabine 0.75mg	Zidovudine 100mg	ZDV+3TC 150-300mg
Daily dose	2	9	9	2	3	6	2
Country importing (South Africa)	1,445 Glaxo			1,628 BMS		1,051 Glaxo	1,810 Glaxo
Country negotiating within the Accelerated Access Initiative (Senegal)	212 Glaxo			274 BMS			730 Glaxo
Country manufacturing locally and importing (Brazil)	248 FarMan-ghuinos	4,041 Roche	7,392 Roche	197 FarMan-ghuinos	88 FarMan-ghuinos	321 FarMan-ghuinos	493 FarMan-ghuinos
Country importing (Nigeria)	963 Glaxo	5,354 Roche	2,628 Roche	854 BMS	1,620 Roche	1,884 Apotex 3,197 Glaxo	2,774 Glaxo

Source: UNICEF et al., 2000; MSF/COCSGAEM, 2001

*prices are for one-patient, one-year treatment in US$

Notes: (1) For Nigeria, the calculation for one year is not based on direct drug company offers, but the lowest prices that are currently available on the market.

(2) FarManghuinos is a state-run generic pharmaceutical company in Brazil.

Recommendations

1. *Price studies.* Organizations such as the WHO or UNAIDS should continue to carry out international comparative price studies on an ongoing basis, as mandated by the 2000 World Health Assembly, in order to assist Nigeria in determining drug purchases. Price studies should include both raw material and finished product prices, taking into account internationally recognized quality standards. These price studies should be the basis for advice and collaboration between the WHO, other United Nations agencies, international donors, and national health authorities.

2. *Cost drivers.* The Pharmaceutical Group in Nigeria proposed that as of 2002, the government should impose high tariffs, 30–60 percent, on drugs that are locally produced (e.g., analgesics, IV fluids, antimalarial drugs, vitamins, hematenics, and some antibiotics and antibacterial drugs), which account for 70 percent turnover of the sector. They urge the government to ensure 75 percent local patronage for drugs from Nigerian companies. They also urged that only pharmaceuticals that are life saving, like HIV/AIDS drugs, attract a 5 percent duty rate. While they want the 5 percent tariff policy on pharmaceuticals to continue, the sector also wants the government to completely waive the existing VAT on

pharmaceutical raw materials as well as containers, hospital equipment, dressing, and finished products. They want all raw materials exclusive to the pharmaceutical industry to attract zero duty (Ikoro, 2001). We concur with these recommendations.

3. *International procurement.* UNAIDS should continue price reduction negotiations that enable access to low-cost quality medicines. They should issue tenders to the proprietary and generic industry for mass procurement of drugs to treat OIs and anti-HIV medicines.

4. *Safeguards on patents.* Patent protection presents a barrier to accessing essential medicines. International organizations should actively support efforts to improve access. There are only four ARV products patented in Nigeria; therefore, there is nothing preventing the import of generic drugs. (Our recommendations for Nigeria's role on intellectual property law and compliance with TRIPS is contained in Section 2.3.3).

2.2 National Health Care, HIV/AIDS, and Drug Policies

There are a number of policies that pertain to health care and HIV/AIDS that are discussed below. Currently, there is a great need to create an overall policy framework that addresses the multiple issues associated with HIV/AIDS. HIV/AIDS programming, which involves foreign aid, government and NGOs, is moving ahead faster than cohesive HIV/AIDS policymaking. However, the government is aware of this fact and is in the process of updating several different policies. We discuss the policies listed below and note that other policies, such as those designed for population, children, and family health, are not included. However, we emphasize that even though some policies are not discussed, they still can be included or linked in an overall policy framework.

National Policy on HIV/AIDS (1997)
Nigerian Antiretroviral Programme (2001)
HIV/AIDS Emergency Action Plan (2001)
National Health Policy/Primary Health Care
National Drug Policy (1990)
Essential Drug List
Drug Revolving Fund
National Health Insurance Scheme

<u>*Recommendations*</u>

1. Begin plans to design an overall framework for HIV/AIDS policy. Such a policy can link all aspects of HIV/AIDS and may include access to drugs; health care design and delivery for PLWHA; criteria for HIV-positive client selection and ARV administration; drug purchasing mechanisms; drug distribution chains; best-practice guidelines for administering and monitoring OI drugs and ARVs; clinical trial protocols; quality assurance mechanisms; education and prevention practices between various target groups, such as CSW and youth; role of professional organizations; human rights in areas of clinical trials, housing, and employment; orphan care policies; gaps and obstacles and suggestions for alleviating gaps and obstacles; strategies between rural and urban areas; legal instruments; law enforcement;

strategies that comply with international law such as the TRIPS Agreement, while ensuring health care safeguards; and sustainability mechanisms and strategies for drug availability, care, and support.

2. Because the National Policy on HIV/AIDS is being revised, consider turning this policy into an overall HIV/AIDS policy.

3. Consider referring to or linking policies, such as the HIV/AIDS Emergency Action Plan (HEAP) and the ARV Plan of Action, as well as other programs within an overall HIV/AIDS policy framework.

4. Implement the Abuja Declaration, either in an overall HIV/AIDS policy and/or the national health policy.

2.2.1 National Policy on HIV/AIDS/STIs Control (1997)

The National Policy on HIV/AIDS/STIs Control (1997) is based on principles of social justice and equity. The policy states that preventive, therapeutic, and rehabilitative care shall be made available to all citizens. It also promotes nondiscrimination and human rights of PLWHA in idealized forms and calls for government legislation against those who violate these rights. These details, among many others in the policy, appear to assume that well-organized medical and counseling infrastructures exist, as there is no mention of financial, resource of structural problems that need to be alleviated to guarantee support, care, and human rights. Access to drugs, which is a large component of care and support, is not mentioned anywhere in the policy. The policy itself makes no statements on "policy" issues per se, but rather is a document that partly shapes a future vision for life without discrimination, as well as full access to educational information about HIV/AIDS in Nigeria.

Recommendation

Because this policy is currently under federal review, consider converting this document into an overall policy framework for HIV/AIDS, which can link or make reference to existing policies on HIV/AIDS and health care delivery.

2.2.2 Plan of Action for Broad Access to ARVs in Nigeria (February 2002 draft)

Currently, there is a February 2002 draft document for a plan of action for access to ARVs by the FMOH. WHO hired a consultant, Dr. Wilbert Bannenberg, to assess the Nigerian Antiretroviral Programme (Bannenberg, 2002). The program lays out objectives and also highlights current gaps in the existing system. Capacity building (human resources, financial, infrastructure, medical, and education) is a key aspect discussed in the document, and currently the government is using both foreign aid and national resources to significantly scale up activities. Both the plan of action and the consultant's report are thorough.

In terms of access to drugs, there are 25 health institutions that have been designated to manage AIDS cases; however, there seems to be no mention of drug distribution, administration, and subvention of ARVs. Poor distribution can lead to serious problems including ARV resistance (Harries et al., 2001). Once generics are registered with NAFDAC, there are questions on how the flow of incoming drugs will be monitored and controlled in order that they do not end up in open markets or in the hands of patent medicine sellers, both of which are not legally allowed to sell controlled medicines (although the practice is prolific). Additionally, monitoring quality assurance also needs to be considered in the plan of action. The consultant raised the issue of whether the government is complying properly with NAFDAC, particularly on the issues of clinical trials and the status of ARVs in the country.

Recommendations

1. The plan of action should consider measures that keep ARV drug distribution under control. The various government, NGO, and PLWHA stakeholders mentioned in the plan of action should consider discussing how the policy might reflect solving problems of drug distribution.

2. Once ARVs enter the country as registered products, the plan of action should consider how quality assurance of new products could be guaranteed. Also, measures against counterfeit ARVs might be considered in the plan of action.

3. Get updated status of ARVs from NAFDAC. Review NAFDAC's policy on clinical trial procedures for new products. See what procedures need to be changed in order to expand the numbers of current participants to avoid drug expiry.

4. Follow up on clinical and operational research by beginning to devise best-practice guidelines for ARV (and OI drugs) to be included in the plan of action.

5. The Government Access to Drugs Committee should consider adding a new subcommittee to examine access to drugs and of the World Trade Organization (WTO)/TRIPS. Or various stakeholders outlined in the plan should consider working very closely with the new intellectual property bill committee that will greatly impact access to drugs. Perhaps an educational workshop with the help of COCSGAEM would be helpful.

2.2.3 HEAP (2001)

The framework of action for HEAP, completed in February 2001, proposes more than 200 activities to be administered on the federal, state, and local government levels with the financial support of international partners from 2001–2004. It provides a detailed analysis of socioeconomic and cultural factors contributing to HIV infection and provides step-by-step activities in targeting various social groups and populations. Moreover, it provides a vision of what the objectives in combating AIDS should be. One concrete objective is access to quality and affordable drugs. Moreover, there are no measures spelled out in terms of how this will be achieved. Also, it is not clear what relationship, if any, HEAP may or should have to the Nigerian ARV Plan of Action or foreign-aid projects (such as the World Bank and Global Fund

money), as it was written before these projects came into being. Moreover, the budget is not clearly defined. Appendix 3 of the HEAP provides an overall breakdown of international donor support. Of the 10 major donors, only DFID, USAID, UNICEF, and IDA provide funds for "infected" and "affected" populations, categories that are not explicitly defined but come close to being a care and support category—although one cannot assume that care and support will be provided under these categories. The Nigerian government, one of the 10 major donors, does not provide funds for these categories at all and sustainability is unclear. Drug procurement for HIV/AIDS is enormously expensive and the current budget for "infected populations" allocates US$12 million, which is lower than that allocated to "affected populations," "removal of sociocultural barriers," and "removal of systemic barriers" categories.

Recommendations

1. Consider exploring policy relationships and/or coordinating mechanisms between the HEAP and the Plan of Action for Broad Access to ARVs.

2. Consider updating HEAP to include a statement on access to drugs or an access to drugs policy.

3. Consider rethinking budget allocation to infected populations or at least explain how money allocated to infected and affected populations will be allocated and disbursed.

2.2.4 Primary Health Care (PHC) and National Health Policy (NHP)

PHC in Nigeria is the basis of the national health care system. Medical care within the system is provided in three types of institutions: (1) PHC, under the jurisdiction of the local government unit (LGA), is designed to be available and accessible to all Nigerians in their communities; (2) secondary health care, under state control at districts and zonal levels, serves largely as referrals from PHC; and (3) tertiary health care, the responsibility of the federal government, provides more specialized medical care and intervention through federal medical centers, teaching hospitals, and other specialist hospitals.

Through the years, the actual implementation of this system faced considerable constraints. By 1982, the NHP was drafted (and then later revised in 1988 and 1996), which explicitly stated that PHC is based on principles of social justice. Its goal was to provide health care to all Nigerians by 2000, in which PHC would be at the center of national health care strategies. Unfortunately, the policy required nearly 50 percent of the national budget for effective implementation (Musa, 1991). The policy subsequently failed for at least three reasons: (1) lack of human resources, money, and facilities as well as poor planning that did not meet the individual needs of each community; (2) waning political will and lack of a political base to run the health care scheme adequately (also, LGA activities came under the supervision of the respective states, which sometimes lead to conflicts and poor distribution of funds); and (3) other aspects of the social economy, such as clean drinking water, housing, environment, and education, that were not in place as solid preventive health care measures (Musa, 1991; Ekunwe, 1993). Therefore, NHP objectives were not always well implemented, and there were severe national performance gaps.

In addition, the NHP failed to meet specific criteria laid out in the document that was meant to facilitate implementation of PHC. These factors include the fact that curative services currently predominate at the expense of preventive services, mismanagement of resources, minimal community involvement, poor health information system, and no evaluation or monitoring of basic health services because of the lack of inadequate data (NPHCDA, 1995) (see Table 19 for additional information). In financial terms, most health institutions spend nearly 80 percent of their total annual budgets on personnel, in which the improvement of drug provision and facilities are left out. Additionally, decreasing federal government allocation of funds on health (less than 2 percent of the national budget) has lead to shortages of personnel, drugs, and support services (Campbell, 1998a). This situation has created a strenuous inadequate distribution of resources; more than 70 percent of health care workers and facilities are located in urban areas (Campbell, 1998b). Facilities in the rural areas are dilapidated mostly because of lack of funding to enable medical clinics to function properly (Musa, 1991). Furthermore, Nigeria's structural adjustment program (SAP), implemented by the International Monetary Fund (IMF), also impacted the decline of available public funds. SAP envisioned total public fund cost-recovery, even though this is next to impossible in a highly impoverished country, which impeded the IMF's stated goal of building self-reliance (Salako, 1997).

Table 19. National Human Resources for Health Care and Medical Facilities

Human Resources	**Total Number**
Physicians	17,345
Dentists	931
Pharmacists (PCN, 2000)	5,591
Community Health Officers	3,988
Community Health Assistants (Senior Community Health Extension Workers (SCHEWs))	3,666
Community Health Extension Workers (Junior Community Health Extension Workers (JCHEWs))	21,056
Health Facilities (Federal Office of Statistics, 1992)	**Total Number**
General Hospitals	387
Maternity	3,649
Infectious Diseases	48
Orthopedic	3
Psychiatric	16
Teaching Hospitals	14
Others (PHC, private, etc.)	9,649
Total	13,976
Ownership (Federal Office of Statistics, 1992)	**Total Numbers**
Federal	204
States	3,353
LGA (PHC)	7,421
Private	2,295
Others (Mission, etc)	687
Not accounted for	14
Total	13,963

Source: Federal Office of Statistics, 1992

The current NHP lists the mounting problems, such as acute shortage of essential drugs, shortage of PHC personnel, and inadequate facilities, but provides no direct suggestions for alleviating PHC constraints as required by the Alma Ata Declaration. Also, there is no law that specifies health functions (legislative or otherwise) of the different levels of government in the current 1999 constitution. That the functions of local government refer to the role of the states in legislating for health points out that perhaps health is a concurrent legislative power of federal and state levels of government (Crisp and Onwudewu, 2000).

Based on interviews and other documentation, we found that health care provided at all levels of government was sparse in terms of human resources, and facilities were overburdened. Few staff have training in HIV/AIDS epidemiology and care, and knowledge of infection control within facilities was minimal. In many cases, PLWHA are not allowed entry into some hospitals or are segregated with little attention from the rest of clinical and hospital populations. Also, mandatory HIV testing is more often favored instead of "universal precautions." Access to drugs is therefore difficult to achieve in environments where PLWHA are shunned or disregarded. In nearly all hospitals, there is no pre- and post-test counseling. Some workers claim that informed consent for testing often fails because little adequate treatment can be offered and also because of stigma and discrimination resulting in patients preferring to not know their sero-status. In the case of OIs, the cost of drugs is often prohibitive, or the drugs are completely unavailable. When they are available, programs such as directly observed treatment scheme (DOTS) are not observed as a PHC regimen. With few exceptions, ARV treatment is almost nonexistent in many teaching and secondary hospitals, and the cost of care is out of reach for those who are HIV-positive (MSF/COCSGAEM, 2001).

The recently signed Abuja Declaration (2001), to which Nigeria is a signatory, states that African nations will dedicate 15 percent of their national budgets to health care, or 5 percent of the gross domestic product (GDP). We emphasize that long-term, sustainable access to drugs for HIV/AIDS is highly dependent on the functioning of quality-driven and affordable health care services. It is important that HIV/AIDS care and support policies and access to drugs are conceptualized and built into the existing NHP and the delivery of PHC services. Concrete suggestions should be provided on how to alleviate obstacles that may stand in the way of the policy's stated objectives and subsequent implementation.

Recommendations

Short-term strategy:

Implement the Abuja Declaration into the NHP and/or within a policy that creates an overall framework for HIV/AIDS.

Long-term strategies:

1. Phase in HIV/AIDS medical care and support in the NHP and the PHC system. Phasing in HIV/AIDS drug administration and monitoring is not only dependent on the government to streamline and implement policy objectives but also on local NGOs and governmental efforts

to sensitize health care workers to HIV epidemiology, health care administration, and human rights.

2. Devise plans for inclusion in the NHP that alleviate the inadequate distribution of health resources, particularly for HIV/AIDS, between urban and rural areas.

3. Develop accounting, information/data, and auditing systems of basic health care services, particularly if an HIV/AIDS care and support program becomes part of PHC.

4. Determine PHC constraints that may limit access to drugs for HIV/AIDS in underserved areas. Come up with cost-effective plans that eliminate constraints.

5. In the process of incorporating drugs into health and HIV/AIDS policies, eliminate the duplication of services and produce greater harmony among government institutions—parastatals, state, and federal ministries—in order that funds can be streamlined and efficiently used and work agendas performed (see Crisp and Onwudewu (2000) for details).

2.2.5 NDP (1990)

The NDP is currently under federal review. The 1990 policy was comprehensive, covering all areas relating to drugs and their use. The goal of the NDP was to make drug supplies—which are effective, affordable, safe, and of good quality—available at all times and in all sectors of the health care system and society. Objectives in achieving this goal included creating public awareness of the unsatisfactory drug situation in Nigeria and everyone's contribution toward rectifying the situation and improving the drug supply and distribution systems; providing the administrative and legal framework for control and regulation; promoting R&D in traditional medicines and basic raw materials; and increasing the political will to support drug supplies. The NDP was charged with establishing an essential drugs program and a revolving fund system with cost-effective mechanisms (discussed below). It sought to increase local production of essential drugs (and increase patronage to local companies) to 50 percent by 1995 and 75 percent by 2000, as well as increase capacity for R&D by 2000.

Unfortunately, the NDP, with all of its lofty goals, failed largely because the NHP failed. Additionally, the 1990 NDP did not achieve the desired results because of smuggling, dumping, and illegal sourcing of drugs; lack of government political will and law enforcement; poor development of the local pharmaceutical industry; and a low degree of federal financial commitment (Ovbiagele, 2000).

The new review committee is attempting to formulate an effective way of implementing the policy. Reforms are meant to ensure the attainment of NDP goals and objectives that focus on self-reliance in essential drugs, vaccines, and biologicals through an effective local manufacturing and drug administration and control system. The ultimate aim is to protect the public from the harmful effects of fake drugs, unregistered medicines, and processed foods (Umejamomere, 2001).

Recommendations

In terms of drugs for HIV/AIDS, the new NDP review committee should

1. Include policies and best treatment guidelines for OI drugs, as well as ARVs for HIV;

2. Come up with ways that guarantee steady access to quality essential drugs, especially through programs in which drugs should be made available without charge (perhaps work with drug revolving fund);

3. Consider devising measures (with other agencies) that update quality control and regulatory mechanisms, especially implementation and enforcement of the law;

4. Explore media, schools, and other outlets for public awareness; and

5. Consider measures for local production and self-reliance (see detailed recommendations in Section 6).

2.2.6 National Drug Formulary and Essential Drug List (EDL) Act (1989)

Among its activities aimed at improving drug access in developing countries (including technical services such as help in drug procurement and performance of needs estimates), the WHO drew up the EDL, which is updated every two years. Drugs are selected on the basis of cost-effectiveness within each drug class (e.g., of the dozens of penicillin types available, only eight appear on the EDL).

According to Nigeria's National Drug Formulary and EDL Act, the need for such a list in Nigeria was due to drug procurement not matching the priorities of health care in the country. One reason given is that the health care system largely responds to the sales and promotional activities of manufacturers. Although the EDL was compiled prior to the HIV/AIDS crisis, there are some issues that may not enable the procurement of drugs for HIV/AIDS and related OIs. For example, importation, sale, or manufacture of drugs not on the EDL is prohibited. Moreover, guidelines for selection to the EDL specify that such drugs should satisfy the health care needs of the great majority of the population. Both these points may exclude ARVs from the EDL, and it is unclear how seriously they will be considered for incorporation.

Recommendation

1. Evaluate generic drugs (ARVs and drugs for OIs) and consider their inclusion on the EDL, especially since both CIPLA and Ranbaxy are in the process of registering their ARV products.

2.2.7 Drug Revolving Fund (DRF)

The DRF was originally established and financed under the Petroleum Trust Fund (PTF) to ensure a sustainable supply of effective, safe, and affordable essential drugs to all three

governmental tiers of the national health care delivery system. Institutions are given "seed drugs" (i.e., initial stocks of drugs) instead of cash. These institutions then price the drugs and sell them to patients at affordable prices to ensure the sustainability of the DRF. Proceeds from the sales are put back into the system so that the money cycles through and is exchanged for new drugs. The PTF/DRF operates a bank account in which the benefiting institutions pay money from drug sales to the PTF but cannot withdraw from it; that money is continually accrued for the sustainability of the program (Okunoren, 1998). In addition, there are patient exemptions to this system that are not the responsibility of the PTF. Instead, it is the responsibility of the benefiting institutions to determine whether certain categories of patients should be exempted.

The PTF institutionalized the DRF in all states of Nigeria. However, since the PTF was scrapped in 1998, the DRF exists only in states where governments have enough political will to keep the fund alive. Within Lagos State, the Pharmaceutical Services Directorate of the MOH conducts central purchasing through tenders. Drugs are supplied to the Central Medical Store, Oshodi, from where they are distributed to all public hospitals according to their requisitions. Proceeds are lodged in the bank, and accountants and auditors ensure that all money is collected. However, although drugs are sold with little margin, complete cost-recovery is not possible because of the free services and drugs for the different categories of patients. We were told that the health board writes the governor/government regularly for reimbursement. It is uncertain whether the money is completely offset.

There are numerous potential benefits to this system. While it may ensure an uninterrupted self-sustaining supply of drugs (in a currently chronic shortage environment) and streamlines distribution, it has the potential of allowing for program expansion and provides incentives for increased funding if well managed. It may also improve patient patronage, stimulate awareness, and encourage community participation in overall health care delivery.

Recommendations

1. Revitalize the DRF in states where it no longer exists. When revitalizing, consider Lagos State as a model, where there is complete separation of the government-controlled pharmacy that handles free drugs, while another section is handled by the private sector, which is responsible for filling prescriptions and selling drugs to patients who are not entitled to free drugs and services.

2. Selection of drugs is usually based on those types commonly prescribed in hospitals and health centers. For HIV/AIDS, each state should consider incorporating drugs that manage OIs. ARVs should be eventually phased into this process.

3. A stock management system (receiving and checking the drugs at store, payment for drugs supplied, distribution of the drugs to hospitals, collection and collation of consumption information) must be well documented and subject to audits in order to discourage the common practice of stealing drugs for outside sale.

4. Government should consider adding a percentage of money annually to increase the initial seed money. Since drugs are largely subsidized, a long-term commitment to funding should be worked out with all identified funding partners, which could include the federal

government, state government, private sectors/industries, international agencies and donors, and the National Health Insurance Scheme (NHIS).

5. Okunoren (1998) suggests that a well-managed DRF cycle could operate like this: PTF (or another government agency) awards a drug contract, the pharmaceutical industry manufactures the drugs (once certain cost-drivers are eliminated), the pharmaceutical industry supplies PTF (or another agency), PTF (or other agency) distributes to beneficiaries, the drug is sold to patients in a pharmacy, money is paid to the pharmacy, which is then paid to the bank on the same day, and the bank pays PTF back. Then the cycle begins again.

2.2.8 NHIS (1992)

The government introduced the NHIS in 1984 and launched it in 1992 with the intent of providing comprehensive health care coverage—curative and preventive—for all Nigerians over time. A new concept for Nigerian health policy, the NHIS is viewed by many as a mechanism for improving health care delivery based upon private health management organization (HMO) models. It has a built-in, self-financing mechanism in which both employers and employees contribute monthly to their health insurance policies. Currently, it is not functioning, but it will be perhaps in the near future. The current draft of the NHIS includes coverage for the gainfully employed (less than 50 percent of the population), with a minimum 10 percent that employees must contribute to their own policy in order to cover spouses and up to four children. For many workers in a dwindling economy, this percentage may be out of reach. Moreover, the push for an HMO model in a country in which 70 million people make less than $1 per day may not attend to the reality of Nigeria's health needs.

The NHIS currently excludes individuals who are HIV-positive, the unemployed, indigent, students, elderly, and retired. At this juncture, PLWHA are not intended to be included at all. The government states that it has plans to include all other non-employed people via voluntary contributions (Campbell, 1998a), whose source and amount has not been defined. Moreover, no timeline has been established for the phase in of this large, yet marginalized, group of non-employed. Our concern is that if poverty is one of the defining at-risk factors for HIV infection, and PLWHA are already excluded from the NHIS, then gaining access to health care and drugs only creates further obstacles.

Recommendations

1. Consider advocating for the general inclusion of PLWHA in the NHIS. If PLWHA are included, then they may want to consider forming cooperative societies (via already established support groups) in the long run as Campbell (1998b) has suggested for poor people in general.

2. As some PLWHA are jobless, there needs to be a clear statement of how the unemployed can access the system and how much government is willing to subsidize the NHIS.

3. The role of pharmacists is extremely limited in that only a few will be registered for supply as well as for surgeries and clinics. Pharmacists need a larger and more significant role in the NHIS.

4. Consider creating a national drug program within the NHIS, which would have the potential of creating accountability mechanisms that facilitate quality assurance, centralized or controlled formulary research, drug-list evaluations, utilization reviews, and credentials.

2.3 National Pharmacy Laws, Regulatory Services, and WTO/TRIPS Compliance

There exists a body of laws, enactments, and decrees that control the practice of pharmacies in Nigeria. Many laws are well conceptualized; however, the greatest problem is that they are rarely enforced. Moreover, there is some overlap and at times the laws create confusion as to which agencies are responsible for implementation and enforcement. Many of the decrees and laws include substances other than drugs and set up elaborate counsels from various ministries to determine illegal acts. At times, this leaves ambiguous the appropriate bodies to determine the violation of the law. In many cases, pharmacists and others have stated that the punishment mechanisms are not stringent enough to deter fraudulent activity. Many of these laws are currently under review, but it is difficult to track exactly how any streamlining process is being debated and discussed. The NAFDAC Decree 15 of 1993 (as amended) and the Pharmacists Council of Nigeria (PCN) Decree 91of 1992 are discussed in Section 2.3.2.

2.3.1 Nigerian Pharmacy Laws

The following is a list of Nigeria's pharmacy laws:

1. Drugs and Related Products (Registration, etc.) Decree 19 of 1993
2. Consumer Protection Council Decree No. 66 of 1992
3. Trade Malpractices (Miscellaneous Offenses Decree No. 67 of 1992)
4. Counterfeit and Fake Drugs Miscellaneous Provisions Act (Cap 73, Law of the Federation, 1990)
5. Counterfeit and Fake Drugs and Unwholesome Processed Foods (Miscellaneous Decree 25 of 1999)
6. Patent and Proprietary Medicines Vendors License (PPMVL)
7. National Drug Law Enforcement Agency (NDLEA) Act (Cap 253 LFN 1990, as amended)
8. Food and Drugs Act (Cap 150 LFN 1990, as amended)
9. Poisons and Pharmacy Act (Cap 535 LFN 1990)

The Drugs and Related Products Decree is meant to protect the consumer from suspected products that are widely available. It seeks to prohibit the manufacture, sale, and circulation of unregistered drugs; however, through a lack of implementation, this decree has not brought organization to drug distribution. Also, there is the problem of drug registration under this decree, which is cumbersome, taking about two years to register a product with NAFDAC. This leads to manufacturers ignoring the registration process, which ultimately creates obstacles for consumer protection.

The Drug and Related Products Decree complements the Consumer Protection Council Decree and Trade Malpractices (Miscellaneous Offenses Decree) in that the producer or distributor is held liable for defective drug products if the defect was caused by failure to ensure that distribution was through proper channels. Where a consumer suffers damages on account of a defective product, the Consumer Protection Council Decree provides that the offending company, firm, or individual shall protect, compensate, and provide relief and safeguards to injured consumers. Nevertheless, these decrees are rarely enforced.

The Counterfeit and Fake Drugs Miscellaneous Provisions Act of 1990 has changed since its inception. Currently, the act increases the punishments for offenders, which are now handled in the federal high courts. In 1999, the Counterfeit and Fake Drugs and Unwholesome Processed Foods Decree 25 was created, which lists a number of places where it is an offense to sell drugs in Nigeria, including open drug markets, kiosks, motor parks, roadside stalls or in any bus, ferry, or other means of transportation, as well as drug premises unauthorized by the PCN. It gives authority to the federal and state task forces, which are full-fledged departments of the NAFDAC, to clear out all illegal drug markets in Nigeria. Nevertheless, this act is rarely enforced.

The PPMVL continues to be issued, especially in urban areas where it is believed that a large portion (32.8%) of fake drugs is sold ("An Appraisal," 2001). The NDP states that PPMVLs should only be provided when there is a dearth of pharmaceutical human resources; however, the majority of these licenses are issued in areas where there are usually adequate numbers of pharmaceutical premises. Patent medicine vendors are only allowed to sell over-the-counter drugs; however, they do commonly sell controlled drugs. The role of the NDLWA is to regulate the consumption of controlled drugs. Over the years, the agency has been accused of extorting money from registered operatives, resulting in the proliferation of nonregistered premises, such as patent medicine shops, to stock fake and substandard drugs ("An Appraisal," 2001).

The Food and Drugs Act (amended in 1999) provides for the regulation, manufacture, sale, and advertisement of food and drugs. The act prohibits the sale of certain food, drugs, cosmetics, and devices; the sale or advertisement of food and drugs as treatment for certain diseases; the importation, exportation, and distribution of specific drugs; and gives the minister power to obtain particulars with respect to certain substances. Also, it deals with and prohibits misleading practices; prohibits the manufacture of food and drugs under unsanitary conditions; gives power to the minister to issue certificates for the manufacture of drugs specified in schedule 4 and 5; designates inspecting officers and analysts and their powers to enter, examine, and take samples and books, and seize and detain violators; and provides penalties for making false statements and obstructing inspecting officers. The act creates provisions for a drug advisory council to advise the minister on reviews and creates penalties ranging from fines of N50,000 or imprisonment for not up to two years.

The Poison and Pharmacy Act (1990) regulates the sale and distribution of drugs and poison, as well as the dispensing, sale, custody, and supply of poisons and drugs. The act provides for the registration and inspection of premises in which persons authorized to enter

registered premises can take samples and inspect drugs and poisons. It also regulates the practices of dispensers and "chemists," and places restrictions on dispensing, importing, sale, delivery, and storage of drugs and poisons. Moreover, it deals with negligence on the part of a dispenser and hospitals; control and sale of patent and propriety medicines; and licensing authority. It also prohibits advertising certain diseases and abortion. Although this is perhaps the most comprehensive act to regulate the sale and distribution of drugs and poisons, its provisions lack any true deterrent due to low penalties, which range from N10–200 or imprisonment of 12 months or both. Illegal sale and distribution of drugs and poisons is one of the main problems of the drug distribution system and a major cause of counterfeiting in Nigeria. Human and financial resources are not available to meet the scope of this law.

Recommendations

1. All of the laws pertaining to pharmacy and regulatory functions need to be enforced. Review enforcement mechanisms that pertain to NAFDAC, PCN, NDLEA, police, and legal apparatus, and consider increasing punishment mechanisms to deter fraudulent activity. This may include evaluating budget constraints and needs assessment of courts and law enforcement. A sensitization process might be necessary for police, NDLEA, courts, and the public in terms of fraudulent/illegal activity and applying the law.

2. Consider soliciting the aid of a competent attorney(s) to review and recommend ways to streamline the laws and decrees in order that the functions, accountability, and implementation of each agency are clearly spelled out (consultants can point to key resource persons). Also, these laws should be well reflected in the NHP and NDP in which HIV/AIDS has a well-defined focus.

3. Review the process of issuing PPMVL. Come up with ways to end the issuance of these licenses where they are deemed illegal.

2.3.2 Drug Regulatory Services and Monitoring Issues

1. NAFDAC
2. PCN Decree 91of 1992

The existence and enforcement of a comprehensive drug regulatory system supported by legislation is a prerequisite for an overall quality assurance system. The first duty of a national regulatory authority is to register pharmaceutical products, thus defining the pharmaceutical market in that country. Only after this has been done is it possible to distinguish between legally traded products and illegal and counterfeit ones. Doing this should ensure that all products subject to its control conform to acceptable standards of quality, safety, and efficacy and that all premises and practices employed to manufacture, store, and distribute these products comply with requirements. Such requirements must ensure the continued conformity of the products to these standards until they are delivered to the end user. Among the responsibilities of drug regulatory agencies are licensing functions, products licenses, manufacturers and distributors licenses, new drug assessments, authorization of clinical trials, powers of enforcement, and technical competencies (WHO, 1997a).

Nigeria had no comprehensive drug regulatory agency, such as the one described above, until 1993, when NAFDAC was created. It was then that drug registration and other preliminary duties of regulation began. Among its many functions and powers, NAFDAC is mandated to regulate and control importation, exportation, manufacture, advertisement, distribution, sale, and use of food and drugs. It is also mandated to conduct appropriate tests and ensure compliance for quality control, investigate production premises, investigate imported drugs, and compile standard specifications and guidelines for production, importation, exportation, sale, and distribution of drugs. It must establish and maintain laboratories to carry out these duties and issue guidelines on advertisement.

NAFDAC is, however, grossly underfunded. Its infrastructure is dilapidated and it lacks personnel to carry out its mandate. There are few quality control labs in the country, resulting in inadequate monitoring and quality assurance. Moreover, there is a dearth of inspectors, which means that inspection can take up to a year to perform. In terms of enforcement, NAFDAC relies on the police—an institution also in decline and not always functioning properly—for the detention of suspects. In terms of imports, NAFDAC officials are not placed onsite at ports for inspection. If customs finds something "unusual," then they call NAFDAC. On advertising, many PLWHA have raised the issue of herbal practitioners advertising curative formulas, which is illegal. There has been no enforcement of advertising herbal and other nonorthodox medicines as curative HIV/AIDS remedies, and the concern of many AIDS activists has been that PLWHA are duped into thinking that they are receiving a high-cost cure. In addition, there has been debate over the responsibility of unregistered drug premises. However, the current statute places responsibility on the Federal Task Force, an arm of NAFDAC, while PCN has jurisdiction to regulate only registered pharmaceutical premises. NAFDAC is currently undergoing reorganization. Although no budget numbers are available, there is concern about the capital available to effectively run, administer, and control foods and drugs in Nigeria.

PCN is charged with implementing, monitoring, and enforcing certain legislation. It is the sole body empowered to license, control, and regulate the practice of pharmacy professions and pharmaceutical manufacturing premises. In addition, PCN provides training in all pharmacy aspects, and it issues pharmacist memberships through a detailed registration process. However, PCN is not backed up with the logistics to establish an adequate and competent inspection division, resulting in the lack of monitoring the points from which pharmaceutical outlets source their drugs or to whom they sell their drugs. There are procedures in the regulatory index to document the sale and use of controlled drugs that inspectors rarely check because the totality of the various responsibilities cannot be met without sufficient resources, leaving imported drugs (approximately 80 percent of the national supply) unmonitored. Rules and regulations of PCN, especially those that relate to inspection, have not been gazetted in many years. Emphasis on fundamental issues such as proximity of pharmaceutical premises to each other, location in open markets, and so forth, are not documented ("An Appraisal," 2001).

Recommendations

1. Duties of NAFDAC and PCN (inspection and quality control) need budget allowances that will enable these organizations to do their work more efficiently. Consider performing a

needs assessment for NAFDAC, PCN, the police, NDLEA, and the legal apparatus to ascertain budget needs and performance of drug regulatory functions. Consider examining the work of the Federal Task Force by scrutinizing its progress and constraints.

2. Devise cost-effective ways to increase quality-control monitoring, including placement of inspectors at ports and borders as well as building quality-control capacity. Consider Pharmaceutical Society of Nigeria's (PSN) call on the government for specific ports of entry and airports to be designated for imported drug products, while at the same time eliminating cross-border vehicle transport if possible (Ukwuoma, 2000).

3. Protocols for NAFDAC drug application and registration should be reviewed and streamlined in order that generics can be made available more efficiently.

4. A proper definition of mandates for the various regulatory agencies is needed to avoid double duty, overlap, and conflicts of interest. Consider ways to resolve the present contradictory stances of PCN, NAFDAC, and FMOH on issues of regulation.

5. Evaluate the following pertaining to good manufacturing practices (GMP):
   - Extent to which GMP in Nigeria comply with international norms and WHO requirements.
   - Level of certification of Nigerian industries for effective GMP.
   - Consumer awareness to demand WHO certification scheme for drugs moving in international trade (Osuide, 1997).

2.3.3 Patents and Designs Act (1990), WTO/TRIPS, and Access to Drugs

The TRIPS Agreement solidifies global and "harmonized" standards in intellectual property rights (IPR) protection. TRIPS, housed within the WTO, was brought into force in 1995. These protections are now linked for the first time to global trade. Nigeria is a signatory to the TRIPS Agreement and must therefore comply with all its stipulations. Nigeria was meant to comply by January 2000; however, it has yet to overhaul its intellectual property law. The significance of TRIPS in terms of pharmaceuticals is extensive. The existing patent protection requires mandatory patenting of pharmaceuticals, which enables a 20-year span, creating monopoly manufacture, selling, distributing, and pricing practices particularly for research-based multinational pharmaceutical companies. These new rules have caught worldwide attention, with subsequent global "access to drugs" campaigns, because the profit motive interests of pharmaceutical companies conflict with public health concerns of civil society and national governments. The monopolistic control on the pricing of pharmaceuticals creates extreme limitations on access to drugs that people in developing countries chronically experience.

Despite the problems posed by the monopolistic corporate control of drugs, the TRIPS Agreement is flexible and provides what are known as "public health safeguards" that a state's national law could choose to incorporate. Nnadozie (2001) recommends the construction of a detailed text for Nigeria's patent law, Patent and Designs Act, in order to comply with and leave open safeguard mechanisms for the access to drugs. The Patent and Designs Act is currently under review, and a 1991 draft version is in circulation. However, this draft was written before

the TRIPS Agreement; thus, work still needs to be done to make it compliant with TRIPS while creating health safeguards. There are three major provisions that a patent law needs to help ensure public health safeguards: compulsory/volunteer licensing, Bolar exceptions, and parallel importation. Compulsory licensing allows for a government official, usually a minister, to declare that in a state of emergency (health included, such as HIV/AIDS), a patented "article" (e.g., drug) can be declared for public need. At that point, the government official can license the manufacturing of the drug to a Nigerian company without the permission of the patent holder. Under the TRIPS Agreement, there are new requirements for compulsory licensing, which include obtaining permission of the patent holder if possible, holding negotiations for price reduction, and ending a compulsory license once emergency needs have been met. Although these requirements are cumbersome, they do not prevent compulsory licensing in any way. Volunteer licensing allows for the manufacture and supply of life-saving drugs, usually through companies that supply generic drugs (through imports or local production) to potentially bring prices down.

A Bolar exception provides for a company to conduct research on an existing drug that is under patent. This allows the company to conduct what is known as "reverse engineering," in which it can create a generic copy, run the generic through clinical trials, and, as soon as the patented drug version goes off patent, have it ready for market. This is an important stipulation because drug development research can take many years. Instead of waiting for the drug to go off patent to begin research, which could actually prolong the life of the patented drug, it allows for the immediate availability of a generic version.

Nigeria's Patent and Designs Act provides for compulsory licensing in remarkably unrestricted ways and should not change with the new drafting of the law. However, compulsory licensing may not currently be the best alternative for access to drugs because the state of Nigerian pharmaceutical manufacturing is in severe decline. However, it should nevertheless be included under safeguards for future use. The same can be said for Bolar exceptions, which are not currently part of Nigerian law but should be included for future use.

Parallel importation is related to what is known as "exhaustion of intellectual property rights." Theoretically, in patent law, once a patent holder releases a product on the market, she or he no longer has any sort of monopolistic control over that product. In other words, IPR ends (or is exhausted) once a product hits the market. This is significant because many global pharmaceutical companies set different pricing standards for the same products being marketed in different countries. Nearly without exception, prices of the same product made by the same company differ across borders. For example, the cost of an ARV drug may be 10 times more expensive in the United States than it is in India, or elsewhere. Parallel importation legally allows for a country to "shop around" for the lowest price of the same product wherever it may be distributed in the world. The TRIPS Agreement stipulates that a state's national law must specify the extent to which parallel importation can be allowed. Choices given are regional, national, and global. Global parallel importation is the best option for Nigeria because it allows for the widest shopping around for drug products. National and regional parallel importation guidelines would be more restrictive for Nigeria and elsewhere in Africa, in that they limit access to the same drugs distributed in other worldwide markets.

Parallel importation would be the best option to guarantee lower prices for access to drugs; however, the Nigerian Patent and Designs Act does not allow for any kind of parallel importation. Even if parallel importation were seriously incorporated into the existing law, there remain several problems due to sentiment on parallel imports as well as Nigeria's own state policy on parallel imports. The first issue of sentiment is mostly with pharmacists and other medical workers who dislike the idea of parallel importation because of increased levels of smuggling fake and substandard drugs, which is a huge problem in Nigeria. Moreover, many argue that increased parallel importation has led to a decline in local manufacturing because it is essentially cheaper to import than manufacture because of high multitaxes imposed on local industry. These concerns are understandable and must be taken into consideration. When incorporating parallel importation into patent law, legal provisions against the flow of counterfeit products should be considered. The second issue on policy has to do with NAFDAC registration regulations, which do not allow for parallel importation because provisions only allow for a national exhaustion of rights. This means that there is limited circulation of products that are covered by IPR in one country to only those put on the market by or with the consent of the patent owner in the same country (that is to say, "shopping around" is only limited within Nigeria). The Drugs and Related Products Decree states that a drug product must be registered with NAFDAC; for registration, NAFDAC requires power of attorney from the pharmaceutical company in registration procedures. Because the pharmaceutical companies are fighting parallel importation because of profit margin impediments, it is unlikely that a company would register its same manufactured product found elsewhere on the world market for a cheaper price. Therefore, these decrees need to also be streamlined when incorporating parallel importation into law.

We found that there is little understanding of the TRIPS Agreement among government workers in terms of its relationship to health. Within several ministries, some workers did not even know about (global) parallel importation as a patent law concept. This might be because of the nature of business practices in Nigeria where business conducted outside of Nigeria remains confined to one or two countries. Moreover, the notion of health is not intuitively linked to trade regimes and practices; and with the chronic problem of ministries not sharing information or networking, it is reasonably understood that the FMOH may not realize that it needs to be in constant dialogue with the ministries of Justice and Commerce, for example, when it comes to TRIPS and access to drugs. It is imperative that the FMOH and other governmental bodies, such as NACA, as well as PLWHA, civil society, Nigerian pharmaceutical industry, pharmacists and others, are considered "stakeholders" in the rewriting of the new patent law. For this to happen, there needs to be thorough education (for government, professional organizations, and NGOs) on the implications of TRIPS so that compulsory licensing and parallel imports become part of a common and shared vocabulary.

The recent 2001 WTO ministerial meetings held in Doha, Qatar, reaffirmed that access to drugs would not be hindered by international trade rules. There have been points of controversy in the past, mainly by the United States, which questioned the legality of compulsory licensing and parallel imports. The Doha WTO Declaration states that each member state has the right to (1) grant compulsory licenses and determine the grounds on which such licenses are granted; (2) determine what constitutes a national emergency; and (3) establish its own regime for the exhaustion of IPR without challenge (subject to national treatment provisions of Articles 3 and 4

of the agreement). This represents a big step forward in the struggle to access drugs, which will be useful for the patent law overhaul.

Nigeria and Nigerians should benefit from compulsory licensing and parallel importation. It should be noted, however, that ARV drugs from most multinational companies are not patented in Nigeria, which means that proprietary drugs and generics can be made freely available.

Recommendations

1. Get updates on the progress of the new intellectual property draft bill and work to include health care safeguards in it. Hire a competent attorney for guidance (consultants can point to key resource persons).

2. Expand national exhaustion of rights to global exhaustion of IPR.

3. Eliminate power of attorney (or find other options) for NAFDAC product registration requirements (see Nnadozie (2001) for detailed text).

4. Sensitize health, justice, commerce, and trade ministries, government ARV program team members, NACA, and members of the Nigerian pharmaceutical industry on IP law and its impact on access to drugs. Provide same information to local AIDS NGOs/CSOs, PLWHA, and other stakeholders (the COCSGAEM should be of help here).

5. Consider streamlining pharmacy, regulatory, intellectual property laws, and TRIPS to properly comply with WTO as well as enable health care safeguards. Nnadozie (2001) has provided suggestions for legal text and implementation recommendations.

Checklist for Policymakers: Public Health and TRIPS

1. Government process and resources
   - Identify trade and pharmaceuticals focal points within the FMOH.
   - Establish contacts, perhaps a working group, with trade and other key ministries (could perhaps be a responsibility of the government access to drugs committee).
   - Obtain reliable specialized legal advice.
   - Develop a mechanism to monitor the health impact of the new trade agreement.

2. National patent and related legislation
   - Promote standards for patent that take health care safeguards into account.
   - Establish process and product patents for 20 years.
   - Incorporate exceptions, trademark provisions, data exclusivity, and other measures to support generic competition (for future use).
   - Permit compulsory licensing, parallel importation, Bolar exceptions, and other measures to promote availability and ensure fair competition.
   - Permit requests for extension of transitional period for TRIPS implementation, which Nigeria needs.

- Do not institute more than the basic requirements of the TRIPS Agreement ("TRIPS-Plus" provisions) (Pérez-Casas and Boulet, 2000a).

Evaluating Impacts of Trade Agreement

The following are key questions for monitoring the public health impact of TRIPS:

- Are newer essential drugs more expensive that they would have been if not under patent?
- Is the introduction of generic drugs being slowed?
- Are more new drugs for neglected diseases being developed?
- Are transfer of technology and direct foreign investment in developing countries increasing or decreasing? (Pérez-Casas and Boulet, 2000a)

WHO has been awarded an observer status by the WTO council and so would be in a position to monitor relevant issues and implications for the sector.

2.4 R&D and Technology Transfer

Currently, there is no R&D policy in Nigeria. The NDP states that 80 percent of the nation's drug needs should be locally manufactured by 2000. While this may not be possible in the short-term, there are some pharmaceutical companies that have high capacity to manufacture drugs. In this section, the work of some public institutions is discussed and the possibility of long-term exploration of commercializing local research is recommended. Also, the role of NOTAP and technology transfer is discussed. Currently, there is little contact or joint research projects being carried out between Nigerian private industry and public research institutions. Also, there is no HIV/AIDS research policy.

2.4.1 R&D

Outside of university institutions, there are four major governmental research, development, and quality control laboratories: Nigerian Institute of Medical Research (NIMR), National Institute for Pharmaceutical Research and Development (NIPRD), Federal Vaccine Production Laboratory, and Lagos State Quality Control Laboratories.

The HIV/AIDS laboratory at NIMR, Yaba, Lagos, was recently funded by the Ford Foundation and upgraded to a reference laboratory for basic, applied, and operational research on HIV/AIDS. The lab is fully functioning and is considered a state-of-the-art laboratory. The complex has specialized laboratories for serology, immunology, microbiology, hematology, clinical chemistry, and virology (NIMR, n.d.).

- *Serology/Immunology Laboratory.* This lab screens for HIV antibodies (Rapid and ELISA methods), confirms HIV sero-status (ELISA and Western Blot), estimates serum immunology levels (IgG, IgA, IgM) and responses of lymphocytes to stimulation with mitogens, such as PHA, Con-A, PWM, measures of cytotoxic T-cells-(TKs), and has an automated estimation of CD4/CD8 levels, plus flow cytometry.

- *Hematology Laboratory.* This lab establishes hematological parameters including hemoglobin, packed cell volume (PCV), white blood cell count (WBC), differential platelet counts, and erythrocyte sedimentation rate.
- *Clinical Chemistry Laboratory.* This lab measures biomedical profiles, including serum proteins (albumins, globulins), liver function test (Serum bilirubin, AST, ALT, Alkaline phosphatase), gamma GT, blood sugar, plasma lipid (HDL, LDL), serum cholesterol, uric acid, kidney function tests (Urea, Creatinine), and Cardiac enzymes (Creatinine phosphokinase).
- *Microbiology Laboratory.* This lab measures microscopy, culture, and sensitivity. Additionally, there are special microbiology techniques for research investigations in fungal, bacterial, and parasitic infections (TB, histoplasmosis, candidiasis, crytococcosis, and crytosporidiasis).
- *Virology Laboratory.* This lab conducts virological investigations including measurement of viral antigen (P24), determination of viral load levels through the measurement of plasma RNA using the Polymerase Chain Reaction (PCR) Method, and HIV subtyping.

The clinical and biomedical activities of the laboratory are in two broad areas:

- *Research:* This activity focuses on the generation of relevant data and information that will be translated into cost-effective intervention strategies to help stem the HIV/AIDS epidemic in the country. This is being achieved through research into various relevant areas of the epidemic in the country.

- *Services:* This activity provides adequate backup services to the various control and management programs on the epidemic in the country, which include clinical and laboratory services for HIV/AIDS patients, monitoring and evaluation of responses by infected patients to the management of OI, enhancement of capacity for HIV/AIDS surveillance systems in the country, and provide adequate services for clinical trials on HIV remedies. Our only concern is the cost of the services, which are obviously unaffordable for the majority of Nigerians.

Services and Prices

- Screening

Rapid (HIV-1&2)	N400
ELISA (HIV-1&2)	N350

- Western Blot

HIV-1	N3,500
HIV-2	N4,000

- P24 Antigen N2,500
- Viral load N8,000
- CD4/CD8

Manual	N2,000
Capsella	N3,000
Facs count	N3,500

- Clinical Chemistry N200–800 (depending on the test)

- Haematology N100–450 (depending on the test)
- Microbiology N100–350 (depending on the test)

NIPRD, located in Abuja, is the only agency with an industrial and aromatic plant extraction factory in Africa used for medicinal plant research. It has a factory for the manufacture of research products without recourse to outside help. The federal government established it as a self-sustaining agency with a mandate to patent and produce drugs. Director General Dr. Charles Wambebe emphasized that the government has given NIPRD a "free hand" to run and fund the institute. The factory is currently involved in small-scale local production of antibiotics. Additionally, NIPRD has pharmacology and toxicology, human biology, and biotechnology/genetic engineering departments. It also has a fractionating unit and medicinal chemistry and quality control departments where the quality of drugs in the open market can be ascertained and drug standardization done. NIPRD has facilities where patients can undergo viral load quantification, immune status monitoring, standardization, and classification of HIV/AIDS drugs. Presently, it is working on HIV/AIDS drugs that have gone through first-phase clinical trials with good success. Within the next year, it will begin human trials. A sickle cell drug is in the last stage of clinical trials, which is patented by NIPRD and will go into commercial use this year. In the TB research department, there are new TB and antifungal drugs for cases of resistance, both of which are undergoing clinical trials. A malaria vaccine, which offers protection for 12 months, is in clinical trials and the results thus far are encouraging. The next stage is set for clinical trials at a teaching hospital. The drug might be ready by next year.

Most materials are retrieved from traditional healers, in which there is an understanding to protect the herbs, patent the discoveries locally, and share the proceeds with local healers and healer associations. Thus far, they have a high success rate in determining bioavailability of the materials chosen.

The Federal Vaccines Production Laboratory in Yaba, Lagos, was established in the 1970s to develop, jointly with Ghana, Yellow Fever vaccines. During an attempt to expand it during the military era, the laboratory was closed down. However, it has now reopened for Yellow Fever vaccine production, to be followed by meningitis and other vaccines. New equipment has been procured and staff have been trained in Senegal and Japan on production and quality control. In the long run, the laboratory hopes to develop its own seed lot; however, for now it wants to purchase seed lots from other companies sufficient enough to meet five years worth of production (by that time, the laboratory would be able to produce its own). Yellow Fever vaccines have been all but phased out by multinational pharmaceutical companies, as continued production is unprofitable despite the fact that Nigeria experienced a severe Yellow Fever outbreak a few years ago. (The only other active plant is in Senegal, which has limited production capacity.) The project could serve as a source of Yellow Fever (and other) vaccines for the emergency program in Nigeria and other countries. And it could guarantee the availability of vaccines even after production has stopped in other places.

The Lagos State Drug Quality Control Laboratory, Ikeja, Lagos, was built by Lagos State with assistance from the World Bank. The primary objective of the laboratory is to conduct quality control analysis for all drugs procured for use by the state government through all its hospitals and medical centers. Medicines are supposed to be subjected to quality tests to ensure

that no substandard, adulterated, or counterfeit drugs are supplied to its central stores, thereby guaranteeing the efficacy and safety of such medicines. The complex consists of an administrative section, microbiology laboratory, chemical laboratory, biochemical laboratory, and other facilities.

Many researchers we spoke to felt that the government often did not understand what it takes (especially monetarily) to run effective R&D projects. In Nigeria, many scientists and researchers have extensive and/or global training, which means that human resources are not the reason for poor R&D. One reason for poor R&D in the industrial sector is due to pharmaceutical manufacturers who view business and profitability from short-term perspectives, although this may be due to a lack of sufficient capital to invest heavily in long-term research. Public research remains greatly underfunded.

Recommendations

1. Consider developing an R&D policy. When creating a policy it might be important to consider the difference in cost between importing and locally manufacturing drugs. If some drugs prove to be more cost-effective by import, then perhaps they should be excluded from an R&D agenda. Others that may be more cost-effective to locally produce should perhaps be priorities within an R&D policy. Additionally, an R&D policy could explore the commercialization of local research.

2. Consider developing an HIV/AIDS research policy.

3. Find ways to make HIV/AIDS monitoring and evaluation services affordable.

4. Consider exploring future HIV/AIDS vaccine development with the Federal Vaccine Laboratory.

2.4.2 National Office for Technology Acquisition and Promotion (NOTAP)

NOTAP was established as the National Office of Industrial Property (NOIP) by Decree 70 of 1979. In 1992, the name was changed to NOTAP by virtue of Decree 82 of 1992. Its main function is to implement the acquisition, promotion, and development of technology, as well as correct certain imperfections in the acquisition of foreign technology into the country. Due to increasing technological divides between North–South, the agency shifted its emphasis from regulatory and control to promotional and developmental roles.

Although NOTAP's mandate is to identify and select foreign technology (based on all legal criteria and requirements) and acquire best contractual terms by Nigerian parties for technology transfer, Nigeria does not have an R&D policy that would encourage, mandate, fund, and use R&D results for pharmaceutical companies. Also, it is supposed to commercialize all R&D results and inventions, promote locally generated technologies, adapt imported technology, supply technical partners, supply basic or detailed engineering, supply machinery and plant training, and disseminate technology information. NOTAP is primarily in place to increase technological capabilities for business enhancement.

NOTAP developed a network of activities involved in the commercialization process, involving compilation of research results and inventions; assessment and evaluation of R&D results and inventions introduction; and provisions for technical assessment, intellectual property rights, market assessment, regulatory issues, financial requirements, development of prototypes feasibility studies, packaging and marketing results, training programs, and making linkages in the commercialization framework.

Our findings suggest that while they might have some data available for foreign investors, Nigerians and Nigerian companies have not truly benefited from many exchanges. Often, foreign technology is brought into the country on terms and agreements that favor foreign organizations. Although NOTAP does not seem particularly happy about such agreements, the organization appears to have alternatives, such as compulsory R&D, control of acquisition costs, tax holidays, and other incentives.

Recommendations

1. Find ways to help Nigerian pharmaceutical businesses benefit from technology transfer.

2. Find ways to assist public research institutions to commercialize research that is cost-effective.

3. Consider educational workshops on technology transfer and commercialization of local research for all stakeholders.

3. Rational Drug Use and Drug Treatment Protocols

Rational drug use is an essential part of the drug policy of any nation. The right drugs should be used for the right indications in the right dosage for the right duration (MOH, 1990). On the other hand, irrational drug use consists of self-medication (often improperly administered), either with prescription or over-the-counter drugs; or the use of new expensive drugs when equally effective, safe, high-quality, and cheaper alternatives exist (MOH, 1990). Also, there are problems when drugs are not equitably available, used to treat the wrong disease, or used for wrong periods of time and not in the correct formulation. Irrational drug use can lead to adverse health effects, including death. It can also bring about increased microbial resistance, which can lead to severe difficulties in treating illnesses and may prolong disease progression and epidemics. In this section, we discuss dispensing practices among pharmacists, which are important to any rational use protocol. We discuss drug treatment protocols for HIV/AIDS because it may serve as an important measure to curb future irrational use of ARVs. Also, we review some studies on drug misuse and drug resistance.

3.1 Context and Dispensing Practices

The problem of antimicrobial resistance has turned into a serious public health concern with economic, social, and political implications that are global in scope and cross all environmental and ethnic boundaries (Williams, 2000; Holloway, 2000). Infectious diseases account for 45 percent of deaths in low-income countries; 90 percent of these deaths are due to six killer diseases: acute respiratory infections (mainly pneumonia), diarrhea-related diseases, HIV/AIDS, TB, malaria, and measles. Antimicrobial resistance is increasingly found in at least four of these diseases. Importantly, chloroquine is no longer effective in 81 of the 92 countries where malaria is a public health concern. More than 20 percent of new TB cases are now multidrug resistant (mostly due to nonobservance of DOTS therapy and poor dispensing practices). To make matters worse, resistance is already emerging to anti-HIV drugs. There are reports of resistance to all currently marketed ARVs.

Drug dispensing is important for the rational use of the end user. Among pharmacists, dispensing drugs is highly mystifying for many patients. Names and dosages of drugs prescribed are rarely labeled (Taylor, 1998), which is common practice and the policy of many hospitals and pharmacies. The reason given for this has to do with the fear of self-medication of controlled products. However, clearly the data show that there already exists a large self-medicating population. The practice of not labeling medication can be dangerous, especially if a patient experiences adverse effects and is not able to tell a medical worker (aside from the one who prescribes the medication) what he or she was prescribed. Moreover, Taylor (1998) also reports that doses, duration of use, storage conditions, and side effects are not well communicated to patients. In addition, Ohaju-Obodo et al. (1998) reports common overprescribing practices. Drug mystification may in fact lead to higher levels of self-medication if there exists widespread ignorance of drugs and their treatment regimens.

The WHO's Revised Drug Strategy (RDS) on Expanded Self-Medication supports expanding self-medication for minor ailments provided there is heightened public awareness.

Also, the Alma Mata 1978 Declaration on PHC supports prescription and the treatment of some ailments at the PHC level by trained health workers.

Recommendations

1. Consider wide-scale education on HIV/AIDS related drugs, their purpose, and drug treatment regimens.

2. Consider eliminating the practice of not labeling drugs and increasing patient education.

3. Consider assisted self-medication under the RDS, involving pharmacists making safe, effective, symptomatic treatments to lessen delays in obtaining services of a physician.

4. Because there is a dearth of pharmacists in Nigeria, consider prescribing and dispensing drugs at all levels of health care, including by volunteer village workers, given that adequate patient and health care worker training and education is in place.

3.2 Current Drug Treatment Protocols for HIV/AIDS and Testing and Monitoring Services

Currently, the ARV Plan of Action has no explicit protocols on drug treatment regimens due to the fact that ARV drugs are still in clinical trials. However, clinical trials of proprietary drugs and the results should also be considered in drug treatment protocols. The new draft for the National AIDS/STD Control Programme listed limitations on the choice of ARVs, treatment options when changing ARVs, and treatment regimes in acute HIV infection. National guidelines on the use of ARV include

- Use in patients with established HIV infection;
- Treatment of asymptomatic HIV patients;
- Initiating treatment in patients with advanced HIV; and
- ARV therapy in pregnant women.

Nevirapine, apparently donated by Boeringer Ingelheim, has been identified in HEAP as a drug of choice for MTCT. HEAP does not state whether this decision was determined via evidence-based treatment or perhaps extracted from manuals in the use of ARVs in resource-limited countries. Sustainability is unclear.

According to Dr. Pat Matemelola, National Network for PLWHA, current efforts are underway to provide access through 100 hospitals treating 10,000 adults and 5,000 children. Testing and monitoring are scheduled to occur in the larger centers, which will pool samples for testing in a regional center. For now, NIMR, NIPRD, Lagos State Teaching Hospital (LUTH), and the general hospital in Lagos are the centers available for testing and monitoring. Only NIPRD and NIMR are equipped to conduct the testing, monitoring, side effects, and efficacy of ARVs. Also, the various designated government ARV trial centers indicated that testing and monitoring are performed. Testing is also available in private facilities; however, we were

unsure as to which ones can perform these tests as well as whether pre- and post-test counseling and monitoring practices are available.

Recommendations

1. Follow up on current (and past) clinical trials by adopting evidence-based treatment guidelines that favor minimal cost, effective responses, patient compliance, low side effects, good tolerance, and low possibility of resistance. Build in multiple second-line treatment therapies to ensure a rapid medical response to any signs of resistance.

2. Consider expanding testing and monitoring services. Perhaps create a network of data/information exchange.

3.3 Summary of (Mis)Use and Resistance Studies

Self-medication and lack of adherence to dosage regimens abound in all regions and societal strata in Nigeria. A survey by Bright and Taylor (1999) showed that irrespective of socioeconomic stratum, self-medication is very high, recording 75 percent as the lowest figure. It concluded that if pharmacists refuse to assist the self-medicating population then morbidity, mortality, iatrogenic, and adverse effects will increase. Also, the population is exposed to a greater danger by easily obtaining drugs from illegal outlets.

The extent of self-medication in Nigeria was measured in the Lagos area in 1997. Demographic characteristics of the respondents showed that males and middle-aged people indulge in this practice because of effectiveness, saved time, and medical relief. Most would not want to see a doctor first, whereas a significant number engage in self-medication without any professional advice. Table 20 shows the demographic characteristics of self-medication.

Table 20. Demographics of Self-medication in a Selected Lagos Area

Demographics/Reasons for Self-medicating	Percent
Males	65.31
Females	34.69
15–25 years	37.90
26–40 years	48.39
41 and above	13.71
Cheapness	32.90
Effectiveness	71.35
Sure relief or cure	85.23
Time saving	66.19
Respondents with clear knowledge of pharmacists	88.79
Respondents who would ask for pharmacist intervention	52.49
Respondents who would see doctors first if ill	9.00
Respondents who feel they do not need a pharmacist	36.11

Source: Bright and Taylor, 1999

Another study assessed drug abuse in a Lagos suburb (UNDCP Information Series No. 4). Results showed that paracetamol had the highest rate of abuse (47%). Others included ampicillin and diazepam (37% each). The most common sources of patient's drugs are stores, "chemists," and pharmacies (75%), while 22 percent obtained their supplies from drug vendors/roadside hawkers. UNDCP Information Series No. 5, a survey of drug use by CSWs, showed that 99.3 percent used paracetamol, 97.9 percent ampicillin, and 85.3 percent diazepam regularly. Of the CSWs, 16.1 percent admitted using drugs without prescription, which included 9.8 percent ampicillin and 16.8 percent diazepam; up to 14 percent said they use ampiclox, tetracycline, and gentamycin when having sex. Few volunteers admitted to using ampicillin (2.1%) before engaging CSWs.

Another survey (Fakeye et al., 1998) was conducted on the attitudes of University of Ibadan students to the use of antibiotics. Of the respondents, 45.1 percent reported using antibiotics for curative purposes, while 36.0 percent used antibiotics for prevention. In addition, 55.4 percent had antibiotics prescribed by doctors, 8.9 percent by pharmacists, and 24.9 percent by themselves or friends or relatives. In this study, bacteriostatic and bacteriocidal antibiotics were taken together. In some cases, antibiotics with the same spectrum of activity were taken together.

A four-year survey of the antibiotic resistant pattern among *E.coli* isolates was conducted in Samaru Village, Kaduna State, from 1988–1991. The isolates from the Samaru Village community, which is populated predominately by low-income earners, peasants, a few highly educated people, and some drug abusers, were resistant to all antibiotics. This might be due to ease of availability (self-medication) in the environment. Isolates from the university community, which is in the same location in Kaduna State, were moderately resistant to commonly used antibiotics compared with the isolates from Samaru Village community. The author concluded that this might be because of more rational use of antibiotics in the university community (Onaolapo, 1999).

TB has seen an increase in resistance of new strains called multidrug-resistant TB (MDRTB). Nigeria has the sixth largest TB infection rate in the world (Sheru, 2000). According to the Netherlands Leprosy Relief (van der Grinten, 2000), the only reliable high-quality drugs available for TB are through NGOs. (Importantly, fake TB drugs have been linked to poor management and distribution (Oke, 2001).) Idigbe et al. (1996) found that among 28 chronic TB cases, the majority of patients did not sustain their treatment and many had mixed infections. In the case of TB, emergence of resistance means that medication that once cost US$20 for initial treatments must now be replaced with drugs 100 times more expensive to fight resistant strains. This could deter access to TB drugs in Nigeria.

Drug resistance to malaria presents a formidable problem to effective therapy. Globally, chloroquine resistance to P. Falciparum occurs in all countries and is as high as 25 percent in Kenya and 31.1 percent in Malawi. In Nigeria, resistance prevalence is as follows (Ekanem, 1997):

S.E. Nigeria:	Aboh Mbaise	8.6% (1989)
	Calabar	5.9–13.3% (1991)

		18.2% (1996)
N.W. Nigeria:	Zaria	6% (1989)
N.E. Nigeria:	Danbao	0% (1988)
		6.6% (1996)

There is no significant change in the status of malaria in Nigeria for several reasons: the population is uninformed, the purchasing power of individuals is progressively diminishing, and the epidemiology of the disease remains unfavorable (Ekanem, 1997). Additionally, Tekobo et al. (2001) found that there was a great misconception about malaria and malaria treatment in Lagos LGAs, suggesting that educational intervention is needed.

3.4 Curbing Overuse and Cost of Antimicrobials: Examples from Chile and Nepal

Chile and Nepal both had similar problems of the misuse of drugs. A study conducted during a 10-year period in Chile showed that most antibiotics had a 300–500 percent increase in sales. After a series of meetings between the health ministry and concerned stakeholders, the ministry acted to control antibiotics by making them available only through pharmacists and by prescription. Although unpopular, compliance was encouraged by distributing leaflets in private pharmacies, by displaying posters, and by extensive coverage on radio and television news programs. The increase in antibiotic consumption during the 10-year period was brought to the attention of superintendent pharmacists. An evaluation conducted three months later showed a 30–56 percent drop in consumption. In one year, antibiotic purchases declined by $6,483,883. Moreover, self-medication and concomitant threat of microbial resistance were reduced; however, it was not indicated whether patients actually had access to the drugs they needed. This question would need careful consideration if such a program were to be implemented in Nigeria.

In another study conducted in Nepal (Holloway et al., 1997), an economic strategy was used to improve prescribing practices. Instead of charging a flat prescription fee, some districts charged a single fee per drug item, while the others charged two fees: a lower fee for cheap drugs and a higher fee for expensive drugs, all covering the full course of treatment. Results showed that these two innovations were associated with a significantly better quality of prescribing. The percentage of patients receiving antibiotics decreased and the proportion of prescriptions conforming to standard treatment guidelines increased.

Recommendations

1. Consider implementing programs such as those in Chile and Nepal.

2. Consider public education campaigns on drug misuse and resistance issues.

3. WHO provides priorities for containment of antimicrobial resistance (see Bavestrello and Cabello, 2000).

4. Drug Distribution

In this section, we discuss current drug distribution channels, drug shortages, patent medicine shops, open markets, distribution of pharmacies and pharmacists throughout the country, and the impact that drug distribution channels have on the access to drugs. Currently, laws pertaining to drug distribution are rarely enforced, which is perhaps the main reason why distribution is chaotic and illegal distribution outlets persist.

4.1 History of Drug Distribution in Nigeria

The original drug dispensation program was based on a colonial administrative system in which drugs were transported to central stores and dispensed by government pharmacists. Facilities were orderly and there were rarely drug shortages. There were few retail drug outlets. Following the Civil War and the oil boom of the 1970s, there was massive hospital and health care expansion. The colonial system of drug dispensation could not meet the needs of an expanding health care system, and the government was slow to react. Moreover, there were post-war businessmen who were looking for commercial opportunities and entered into pharmaceuticals. This is the point at which the circulation of substandard and fake drugs became a concern in Nigeria. Government, steeped in post-war reconstruction efforts, could not immediately reconstitute or expand the regulatory organs to forestall the growing chaos of drug distribution ("Pharma Industry in Distress," 2000).

The import license era during military rule was uncontrollable, and nonprofessional pharmacists could freely import drugs and sell them at huge profits. Together, military and civilian counterparts took over drug markets. Additionally, overseas manufacturers found the 70 million-person market lucrative and started to pack and distribute imported drugs in Nigeria. Companies such as Pfizer, Abbott, Glaxowellcome, and Roche came to Nigeria and started to manufacture drugs ("Pharma Industry in Distress," 2000). Not until 1990 was the NDP executed, giving rise to NAFDAC.

4.2 Current Drug Distribution System and Channels

The word most often used to describe drug distribution in Nigeria is "chaotic." Pharmacists have lost control and there are few enforcement efforts to curb illegal activity. The private sector distribution outlets are currently concentrated in urban areas while the rural areas are neglected. Problems of parallel importation of counterfeit drugs and drug dumping have led to questions of safety, efficacy, and quality of drugs available and accessible in Nigeria.

Drugs can be purchased from nearly any outlet, including manufacturers, wholesalers, and retailers. Both over-the-counter and controlled drugs are available in open markets, pharmacies, patent vendors, and hospitals. In other words, drugs that are available are very easy to find and very difficult to control. However, many available drugs, especially from illegal outlets, are fake and/or substandard. Therefore, the end user may have trouble accessing drug quality, at the right price, in the right quantity and quality, and from the right people (Anyika, 1999).

In addition, several fundamental problems have emerged as a result of the chaotic situation of distribution in Nigeria. One is that there is a chronic out-of-stock syndrome, in which drugs that are needed by the populace are continually unavailable. A second problem is the number of counterfeits (previously discussed) entering the country and circulating in Nigeria, as well as high numbers of stolen and smuggled goods. Two of the major distribution mechanisms for substandard and fake drugs are open drug markets and the growing number of patent medicine shops (intended for over-the-counter drugs, but can sell controlled products as well), which are not well regulated. Both open drug markets and patent medicine shops are discussed in detail below.

Other major challenges for those that are in compliance with the PCN (as opposed to running illegal outlets) include transportation, unavailability of funds, lack of electricity for storage regulation, and unreliable telecommunications. These obstacles lead to a lack of desire to dispense drugs, particularly in rural areas, because such constraints cannot meet PCN stipulations for drug storage, and so forth.

NAFDAC recently reported (Adeloye, 2001) that it has concluded plans to introduce official wholesale drug marts in the six geopolitical zones in Nigeria. The new zonal drug marts will be under the supervision of NAFDAC and PCN. However, establishment of drug marts may not necessarily remove the problems of counterfeit drugs if illegal markets are not dismantled. Not only would patronage continue, but the easy distribution and circulation of counterfeits through the primary source of markets to retail outlets would continue. Moreover, the NAFDAC marts would not stop the importation and sale of unregistered products, or correct the inefficiency of customs, the porosity of ports, and the problems of meeting GMP guidelines.

The government has established all the decrees and powers to regulate and prescribe ways to deal with illegal trading and selling practices. No new laws are needed to create better and healthier distribution practices. Consumer protection laws, combined with established pharmacy laws, need to be applied in order to ensure better distribution practices as well as public health guarantees. The biggest problem is a complete lack of implementation and enforcement of the law.

4.3 Drug Shortages

One of the major impacts of the poor drug distribution system is chronic drug shortages. Drug shortages could be classified as the (1) absence of prescribed drugs as a result of non-availability; and (2) inability of the patient to go home with prescribed drugs, even when such drugs may be available in the hospital.

Chukumerije (1982) reports that drug shortages in hospitals are fairly rampant. One reason is inadequate budgeting for drugs. Other reasons include prescribing drugs for which substitutes were available, prescribing based on patients' wants, prescribing for themselves or relations, and prescribing brand products. Also, there are flaws in pharmacy practice, in which pharmacists access drugs through the wrong purchasing system and order too many bulk supplies, which lead to easy drug expiration. Drugs have also been found to be stored

incorrectly. In addition, there exists a lack of hospital formularies that lead to problems of pilfering. Sometimes payment is not made regularly to contractors, which hinders supplies.

There are several government-run free drug programs that need to be reviewed in terms of access to drugs, since there are many reports that indicate problems with drug shortages and lack of access through these programs: National Immunization Programme for Children, Lagos State Free Malaria Programme, Lagos State Free Eye Treatment Programme, and Lagos State Free Health Care Services for Pregnant Women. In addition, the Lagos State free emergency treatment in the case of accidents (MOH, 2001), and some NGOs and international organizations fund and provide TB treatment in about 16 states.

Drug shortages can be disastrous for HIV and TB—infections that are difficult to monitor and can develop resistance quickly if drugs are not available and properly administered. Several PLWHA with TB were interviewed who said that sometimes when they go to retrieve drugs from the hospitals there are none available for them. Some even reported that medical workers had private stashes of drugs that they offered to sell "under the table," usually at high prices. It must be kept in mind that, among many other factors, free treatment programs largely fail because of inadequate drug distribution.

4.4 Patent Medicine Shops and Open Drug Markets

According to Ovbiagele (2000), patent medicine shops outnumber pharmacies. One of the criteria for granting patent medicine licenses is that patent medicine shops must be in an area where community pharmacies are not available (especially in the rural areas) and where controlled drugs are not available; however, such licenses are granted without consideration of location.

Even with laws and decrees in place, drugs can be sold on the open market, which leads to the problem of uncontrolled illegal drug markets in which drugs for sale are stolen, smuggled, and/or expired. Ezeanya (2000) reported that open markets are greatly financed by and have the protection of unions. In such settings, there are usually no ideal conditions to store and keep drugs, thus eroding biochemical content and decreasing the efficacy of already existing spurious drugs. In some cases, this leads to adverse side effects and death (Fashesin, 1998).

According to PSN President Alhaji Mohammed Budah, there are more than 40,000 illegal premises in Lagos selling drugs. Additional drug markets are spread across the nation: Idumota in Lagos, Ariria in Aba, Head Bridge in Onitsha, and the Kano market. Others are at Ogbete in Enugu, Gamboru in Maiduguri, Gombe, Kaduna, and Owerri (PSN, 2001). In August 1999, a survey conducted in Lagos State revealed that there were about 20,000 illegal drugs premises scattered in the 20 LGAs of the state (PSN, 2001). Another survey conducted in June 2001 for the PSN showed that the number of illegal premises in the state increased from 19,708 to 48,376 because of the inactivity of the regulatory authority, NAFDAC (PSN, 2001).

4.5 Private Pharmacies, Hospital Pharmacies, and Community Pharmacists in PHC

This subsection details the distribution of private pharmacies, hospital pharmacies, and community pharmacists working in PHC throughout the country. Table 21 shows the total number of pharmacies and pharmacists distributed throughout the country by state. Table 22 shows the percentage of pharmacies and pharmacists concentrated in the rural areas. The criteria used in determining what counts as urban, as opposed to rural, were whether modern infrastructure facilities, as well as larger scale commercial activities, are in place. For many states, particularly in the north, this means that many urban communities are concentrated in state capitals. It should be noted that 30 percent of all pharmacy premises in the country are located in the city of Lagos (however, Lagos has the highest number of illegal premises and the highest number of PPMVL, which are supposed to be in the rural areas). Moreover, statistics demonstrate that every single state in Nigeria inadequately serves rural areas; in some states, many urban areas are grossly underserved as well.

Table 21. Percentage of Urban Pharmacy Premises in Nigeria with Total Number of Pharmacies for Each State

State	%Urban	# Pharmacies	State	%Urban	# Pharmacies
Abia	80	86	Kano	77	74
Adamawa	66	38	Katsina	75	14
Akwa Ibom	60	27	Kebbi	50	7
Anambra	60	139	Kogi	80	28
Bauchi	96	22	Kwara	90	40
Bayelsa	100	5	Lagos	98	861
Benue	99	36	Nasarawa	66	22
Borno	90	51	Niger	87	54
Cross Rivers	80	31	Ogun	77	97
Delta	70	66	Ondo	81	51
Ebonyi	100	7	Osun	80	37
Edo	93	94	Oyo	93	131
Ekiti	65	15	Plateau	87	81
Enugu	90	60	Rivers	90	125
FCT	50	159	Sokoto	100	11
Gombe	80	10	Taraba	95	11
Imo	70	63	Yobe	100	8
Jigawa	0	0	Zamfara	83	6
Kaduna	90	106			

Source: Statistics derived from PCN, 2000

Table 22. Total Number of Registered Pharmacists in Nigeria by State

State	%Urban	# Pharmacists	State	%Urban	#Pharmacists
Abia	95	128	Kano	96	199
Adamawa	94	63	Katsina	83	28
Akwa Ibom	91	46	Kebbi	75	12
Anambra	89	199	Kogi	80	60
Bauchi	96	43	Kwara	95	97
Bayelsa	87	15	Lagos	99	2,069
Benue	95	64	Nasarawa	87	38
Borno	97	70	Niger	87	92
Cross Rivers	85	44	Ogun	77	131
Delta	97	125	Ondo	94	93
Ebonyi	99	20	Osun	92	109
Edo	97	199	Oyo	98	283
Ekiti	94	34	Plateau	91	150
Enugu	96	179	Rivers	95	233
FCT	96	299	Sokoto	99	23
Gombe	85	27	Taraba	89	26
Imo	81	100	Yobe	99	12
Jigawa	74	15	Zamfara	90	11
Kaduna	93	206			

Source: Statistics derived from PCN, 2000

Accessing drugs in government hospitals is usually conducted through DRFs. Some states, and sometimes individual hospitals, are given the freedom to purchase drugs that are urgently needed from suppliers. Private hospitals and sometimes community pharmacies manage their drug supplies independent of DRFs. LUTH, for example, bases its drug selection on the EDL and then sources its drug supplies from government donations (secured by competitive bidding—open tenders, local purchase orders, or direct purchase, whereby multinational companies are usually favored), donations from pharmaceutical companies, World Bank projects, and NGOs (Anyika, 1998). Anyika (1998) stated that the cost-recovery of DRFs could be delayed from one to two years. Eniojukan et al. (1997) reported that out of 50 hospitals surveyed, only 60 percent operated a DRF in 1995, and that pharmacy departments were lacking in specialized clinical services. Additionally, none offered patient education clinics, drug-use evaluations, and pharmaco-economic evaluations; and few offered patient and drug therapy monitoring, such as patient review charts or patient medication profiles. Eniojukan et al. (1997) concluded that these gaps were due to an absence of well-defined departmental objectives and aims; lack of well-defined standards and guidelines for pharmaceutical practice; and lack of vision of what pharmaceutical practices and services should provide.

Community pharmacists are placed at PHC levels. Eniojukan and Adeniyi (1997) found that community pharmacists are not well integrated into PHC programs, and most community pharmacists surveyed (90%) believed that the government has no defined role in PHC programs for pharmacists. The WHO recommends that pharmacists be involved in training community workers responsible for the management of pharmaceutical services at local levels. While community pharmacists are perhaps well suited for this role, they are completely left out of this function (Eniojukan and Adeniyi, 1997; Tayo 2001).

Recommendations

1. Consider forming a committee that evaluates the constraint of enforcing drug laws dealing with distribution:
   - Consider measures (including public education and media announcements) to dismantle open drug markets. Consider the short- and long-term cost of taking such measures.
   - Consider measures for and possibilities of inspecting patent vendors.

2. Consider ways that pharmacy practice and number of pharmacists can increase where there is a dearth of services, bearing in mind all constraints. Especially explore ways that can help alleviate the constraints on pharmacy practice in rural areas, perhaps in the form of incentives or assistance, such as subsidizing electricity or cold storage. Perhaps consider tagging pharmacy premises to other national programs, such as the government ARV program, the NHIS.

3. Considered periodic review of hospital drug formularies where newer more cost-effective drugs can replace more expensive ones; and consider purchasing drug stock from local pharmaceutical companies. Come up with ways to create better and more streamlined pharmacy services (such as data management and record keeping) in hospitals, which gives attention to patient care and education.

4. Consider ways to more broadly develop the role of community pharmacists in primary care institutions.

5. Consider ways of streamlining drug distribution systems while eliminating drug shortages. Devise ways of ensuring steady supplies of drugs designated for free treatment programs.

5. Quality Drugs and Quality Control

In April 2001, *Lancet* reported that out of 581 drug samples available in Nigerian pharmacies, selected on the basis of their inclusion in the WHO EDL, 48 percent did not comply with set pharmacopoeial limits (Taylor et al., 2001). Quality drugs are an important part of accessibility, since they help ensure efficacy for any treatment regimen. Ensuring quality drugs requires the coordination of several institutions that conduct regulatory, inspection, quality assurance, and distributional work. In this section, we discuss counterfeit drugs, substandard drugs, and problems of ensuring regulatory and enforcement mechanisms, as well as problems with ensuring quality assurance of medicines in Nigeria.

5.1 Overview of Substandard Drugs in Nigeria

Substandard, noncounterfeit drugs (both imported and locally manufactured) are abundant. A substandard product is one that contains excessive microbial contamination or has too much or too little active ingredients contributing to drug effectiveness. The pharmaceutical industry sometimes produces products with contamination in excess of established limits, which is often due to inappropriate or contaminated water supplies, raw materials, and storage (Ogbeche, 1998).

Quality assurance is extremely compromised because of an inadequate infrastructure. In addition to GMP, the regulation of drugs requires that independent laboratories (within NAFDAC) oversee quality assurance. NAFDAC operates four functional labs that determine compliance: Central Lab, Oshodi, Lagos; Central Drug/Vaccine Lab, Yaba, Lagos; Yaba Area Lab, Kaduna Area Lab, and Maiduguri Area Lab. Others are planned for Port Harcourt, Calabar, Enugu, and Kano. Every one of these labs are equipped for analytical studies for drugs, food, and pesticide formulation, including pesticide residues, radiation, water, seafood, and organoleptic testing. Technologies used are nuclear magnetic resonance (NMR), high-performance liquid chromatography (HPLC), gas chromatography/mass spectrometry (GC-MS), gas chromatography with electron capture detection (GC-ECD), gas chromotography with thermionic specific detection (GC-TSD), atomic absorption spectrometry (AAS), ultraviolet and infrared (UV and IR) spectrometry. Microbiology testing is done in Oshodi, while tests for vaccines and biologicals are done in Yaba. A total of 51,565 samples were analyzed between 1994–1999 (Madukwe, 2001), which indicates that capacity needs to be built up to accommodate more testing services.

Pharmaceutical products such as oral and topical preparations are generally not required to be sterile; however, it is desirable that they contain low levels of microbial contamination. High levels of microbial contamination may result in spoilage and degradation of the products and/or may constitute a health hazard to the user. A study carried out by Onawunmi (1999) showed gross contamination of the samples tested with pathogenic organisms such as E.coli and Salmonella (see Table 23). Presence of these contaminants is attributed to the contaminated water and raw materials used and non-adherence to GMP. Notably, a report by the Netherlands Leprosy Relief and Royal Tropical Institute showed that 305 of all the TB drugs analyzed in

Nigeria did not pass the quality assurance test and suggested that this is a major contributor to the development of multidrug resistance TB (van der Grinten, 2000).

Table 23. Percent Contamination of Selected Medications

Mixture/Medication	Contamination (%)
Magnesium Trisilicate mixtures	55.0
Kaolin and Morphine preparations	83.0
Kaolin mixtures	18.2
Potassium Citrate	33.3
Cough syrup	14.3
Chloroquine syrup	18.2
Blood tonic	6.7
Infant teething mixture	25.0
Antacid suspension	50.0

Source: Onawunmi, 1999

Another study carried out by Taylor et al. (1998a) on ampicillin/cloxacillin, the most abused drugs in Nigeria, found that all drugs sampled failed the content of active ingredients test. Taylor et al. (1998b) conducted a study on magnesium trisilicate mixtures and found that 70 percent of all samples were contaminated with bacteria (bacillus and diptherids) beyond specified limits. They cite Lamikanra and Onwudike (1981), who reported the isolation of 11 different types of bacteria from tap water, which is the vehicle that is used in the preparation of liquid pharmaceuticals in most Nigerian hospitals and small-scale industries. Overall, good quality drugs require GMP, quality manufacturing, and rigorous auditing systems.

Recommendations

1. Determine NAFDAC's and other quality control laboratory's financial and human resource needs to carry out quality assurance and control activities. Ensure proper distribution of funds.

2. Develop general GMP guidelines that enable both manufacturers and regulatory bodies to be in constant dialogue with each other.

5.2 Overview of Counterfeit Drugs in Nigeria

Counterfeit medicine is a pharmaceutical product that is deliberately and fraudulently mislabeled with respect to identity and/or source. Such drugs may include products with correct ingredients, with wrong ingredients, without active ingredients, with insufficient quantity of active ingredients, or with fake packaging. There is inadequate and little consistent information about the scale of worldwide pharmaceutical counterfeiting. According to public and confidential reports received by the WHO from 1982–1997, counterfeit pharmaceuticals were found in at least 28 countries, although many cases were not confirmed or validated. In 25 percent of 751 cases, counterfeit drugs were reported to come from the following places in the

following percentages: 25 percent from industrialized countries, 65 percent from developing countries, and 10 percent from unspecified sources (WHO, 1997c).

Counterfeiting came into existence before 1974 when the Food and Drug Decree No. 35 was promulgated. Unfortunately, due to national and world economic recessions, drug products were placed on import license. With the devaluation of the currency, expendable income of the average Nigerian became lower, thus making drugs more unaffordable to most Nigerians. The high demand for drugs, due largely to inappropriate use of drugs, still persisted, creating a vacuum that led to the rise of illegal importing of fake drugs, which came in cheaper than the genuine drugs imported by qualified or knowledgeable importers. When the government became aware that the existing decree could not adequately address the situation, the Counterfeit and Fake Drugs Decree No.17 of 1989 was promulgated, which established the Federal Task Force (an arm of NAFDAC) in 1989. This decree was later repealed and replaced with Decree 25 of 1999, which carries all the provisions of the former decree, but includes a stiffer penalty for forfeiture and an option fine of N500,000.

The Nigerian market is saturated with counterfeits, which are a major cause of treatment failure and development of drug resistance. Counterfeits also increase morbidity and mortality, while decreasing productivity and further worsening the economic burden and poverty of the masses (Brown, 1999). PGM-MAN reported the following statistics:

- 49.6 percent of counterfeit drugs can be traced to open drug markets.
- Patent medicine dealers distribute 32.8% of counterfeit drugs.
- 58.8 percent of physicians in Lagos purchase from open drug-market dealers as their vendors of choice.
- 10.8 percent of cases of consumption of counterfeit drugs lead to adverse drug reactions and fatality (PMG-MAN 2001).

A 1998 survey by the School of Pharmacy, College of Medicines, Idi Araba, Lagos, showed that the volume of fake drugs coming from the open drug markets has risen from 33 percent in 1988 to 49.6 percent in 2001 (PSN, 2001). Nigeria is dependent on imports for the majority of its drugs (about 80%), which means that a great deal of effort must go into quality assurance that greatly burdens the regulatory system.

Director General of NAFDAC, Dr. Dora Akunluyi, stressed the alarming growing rate of Nigerians dying of hypertension, heart failure, and stroke linked to fake and adulterated drugs. Table 24 indicates the percentage of fatalities, complications, and resistance incurred as a result of counterfeit and poor quality drugs.

Table 24. Fake and Substandard Drug Impacts

Fake/Substandard Drug Impacts	Percent
Fatality rates	12.8
Resistance to drug therapy	52.9
Therapeutic failure of spurious drugs	10.0
Increased severity	48.2
Development of complications	34.2
Physicians who had life threatening encounters with fake drugs	29.0
Physicians had life threatening encounters with fake drugs, resulting in death	9.1
Adverse drug reactions	23.6
Therapeutic response to adverse drug reactions when the source or brand was changed	29.7
Antibiotic counterfeiting accounting for total numbers of death	21.0

Source: PSN, 2001

5.3 Pakistani Experience in Combating Counterfeit Drugs

Pakistan had similar experiences with counterfeiting, and several steps were taken before the situation was brought under control. Pakistan started with an enlightenment campaign, directed at the public, manufacturers, importers, and every stakeholder, which warned through the print media of stern action. Additionally, authorities set up a high-powered task force that

- Reviewed the existing licensing policy of drug sales and proposed changes;
- Recommended the review of drug laws within two weeks;
- Inspected and screened existing pharmaceutical companies and stores and took action against offenders; and
- Took measures, including legislation to stem counterfeits.

In dealing with all these issues, the task force noted that even if only one aspect of the law could be enforced, then many issues relating to counterfeit and substandard drugs could be alleviated. The most useful section of the law that was used for this campaign read, "No person himself or by any other person on his behalf...can sell any drug without having a warranty in the prescribed form bearing the name and batch number of the drug issued" ("The Task that Lies Ahead," 1998). The bill of warranty could prove that a licensed manufacturer manufactures the drug, the drug is registered, and bears the batch number and expiration date. Ensuring bill warranty would mean excluding and controlling the availability of all kinds of illegal drugs, which is important because it ensured that there is a proper drug audit and that any spurious drug found could be traced back to the manufacturer. The task force was mandated to raid medical stores and check the bill warranties for the medicines that were being sold. A 14-day period was given for pharmacies to arrange and keep the warranties. After a deadline of two months, the task force began its raids with drug courts in place. Within three months, it handled 828 cases; and for the first time, those violating the law were charged and convicted.

Recommendations

Obileye (2001) suggests that the most successful path to combating counterfeit drug trading in Nigeria is a multipronged legal (enforcement) and policy approach. These are long-term strategies that may need review of budget and capacity constraints.

1. Critically examine the entire legal framework to ensure that there are no loopholes for counterfeiting:
   - Define and control the legitimate drug market and the drug distribution system before effective control can be applied to illegal trade and counterfeiting.
   - Designate points through which pharmaceuticals can be imported or exported. Customs staff, with NAFDAC assistance, should be alerted at these designated points to the significance of pharmaceutical counterfeiting and trained to identify counterfeit products.
   - There should be targeted inspection of pharmaceutical goods at the border points and samples should be taken for analysis when appropriate.

2. Consider forming a drug court and take legal action against those violating the law, as in Pakistan (perhaps after consulting Pakistan officials). Include public education and enlightenment campaigns. Enforce all relevant pharmacy and regulatory laws: Counterfeit and Fake Drug Decree 21, 1988, Sections 1 and 2; NAFDAC Decree 15, 1993, Parts VI:24, 25; National Drug Formulary and Essential Drugs Decree 43, 1989, Sections 2, 8; Drugs and Related Products (Registration, etc.) Decree 19,1993, Section 1.1 and 7; Pharmacists Council Decree 91, 1992, Section 8.3,20.1, 23.2,4,5.

3. Equip, staff, and fund the inspectorate in NAFDAC and PCN. Also, each facility within the distribution chain should be registered, licensed, inspected, and required to maintain complete records of the source from which the consignments are purchased.

4. Cooperate and exchange information between different law enforcement agencies for which inspectorate units need to be in place. Attach a police squad to the inspectorate division in order to work in cooperation with regulatory authorities. Ensure that manufacturers, distributors, and health care professionals make known the details of any suspected counterfeit products to the law enforcement agencies.

5. Use the tools available under the WTO in which complaints are handled internationally since counterfeiting is an international industry (WTO, WHO). Allow companies the right to private actions that enforce their IPR.

6. State of the Local Pharmaceutical Manufacturing Industry

In this section, we discuss in brief how drug manufacturing worldwide does not meet health needs throughout developing countries. We discuss the production capacity in Nigeria; also, because local industry has expressed desire to expand, we provide recommendations.

The research-based pharmaceutical industry (mostly multinational companies) has been responsible for the development of more than 90 percent of new drugs produced worldwide and devotes approximately 15 percent of its sales revenue to R&D (Pécoul et al., 1999). A small percentage of these new drugs actually meet the needs of Nigeria and other developing countries. However, most of these companies are not interested in pursuing drug development research for diseases endemic to countries such as Nigeria; the prevailing view is that such research would be unprofitable since the target markets are predominantly poor countries (Pécoul et al., 1999). Specific examples include the near nonmanufacturing of Yellow Fever vaccines by global companies as well as a dearth of research going into MDRTB.

Local manufacturing consists of multinational companies and indigenous manufacturers. Multinational companies, which entered Nigeria a couple of decades ago, no longer produce in-country and have sold off their plants. These include GlaxoSmithKlineBeecham, Pfizer, Bayer, Hoescht, Ciba-Geigy, and recently Roche, which divested the majority of its shares from its Nigerian subsidiary. These companies are now engaged in importation of finished products.

There are more than 130 pharmaceutical companies in Nigeria; however, only 60 are actively manufacturing despite the installed capacity to produce 50–70 percent of the nation's drug need. (Capacity utilization is below 30 percent of installed capacity.) ("Pharma Industry in Distress," 2000). In Nigeria, most of the pharmaceutical plants were built in the 1970s, and many need refurbishment and new plants ("Pharmaceutical Industry," 2000). The NHP states that only 20 percent of all drugs can be imported. Currently, 20 percent of all drugs on the market are manufactured in Nigeria and 80 percent imported (PGM-MAN, 2001). Raw materials are nearly 100 percent imported. Most drugs manufactured in Nigeria include vitamins, antimalarials, some antifungals, and analgesics. There is virtually no communication (or joint research projects) between the private manufacturing pharmaceutical sector and the public research sector. No ARVs are generically manufactured anywhere in Africa.

In some cases worldwide, improving technological capability has been enacted via public–private collaborations between technologically/financially rich and poor institutions, in which poorer institutions pursue technology transfer and technical training and assistance. Usually, this comes in the form of clinical development phases, clinical trials, and some research and manufacturing. Nigeria does not have an R&D policy that would encourage, mandate, fund, and use R&D results in pharmaceutical companies. In some cases in Nigeria, and elsewhere in the developing world, technology transfer or research assistance rarely works out. Both the TRIPS Agreement and the Convention on Biological Diversity have provisions for technology transfer, and it would greatly help local research and manufacturing units to be educated on their rights for capacity building. Occasionally, a pharmaceutical company's desire to enhance its public image plays a decisive role in getting a drug produced. Advocacy initiated by civil

society facilitates development and/or distribution for some compounds or genetic material abandoned by industry as insufficiently profitable. Also, regulations, such as those governing expiry or absence of patent, a patent approaching expiry, or fast-track approval, provide leverage for drug development (HAI-Europe, 1999b).

Producing more complex drugs such as ARVs might only be possible in Nigeria if technical assistance and technology transfer were instituted with training. Benefits of exploring such possibilities are as follows: first, local manufacturing cuts down on the number of imported drugs, which is the largest source of counterfeits in the country. Second, it has the potential to cut down on cost of expenditures leading to inexpensive higher quality drugs. Although in some cases, importing drugs may be even less expensive than local manufacturing. Third, local drug manufacturing has the potential to better match the nation's drug and health needs.

Recommendations

Because there is the desire on the part of the local industry to upscale activities, we suggest the following long-term considerations.

1. Consider forming an investigative committee (including, but not limited to, Ministry of Science and Technology, NOTAP, NAFDAC, the private sector, and public sector research institutions) to determine current capacity for R&D and manufacturing in both private and public sectors:

    - Identify various public research projects as well as different companies' capacity for manufacturing. Determine how and if research can potentially be commercialized in a way that begins to meet the health needs of the nation.
    - Determine potential costs and capital needed for local manufacturers, including quality control, technical assistance, facility enhancement, and so forth. Also, determine costs for all stages of drug development from developing raw materials to finished marketed products, while factoring in potential capital and tax relief. Consider sourcing for external funds and/or joint funding/research projects to offset part of the cost.
    - Consider mandates for research institutes, universities, NGOs and pharmaceutical companies to undertake research into specific drug development.
    - Brazil is offering a government-to-government technical and technology transfer program in the production of ARV, which could be investigated.

2. PGM-MAN has called for creating tax incentives, high-tariff penalties, tax holidays, transfer of technology, and import substitution measures as means of positively effecting R&D. Consider increasing government patronage to the local industry. Evaluate how such measures may or may not help the industry.

3. Explore joint collaborative efforts with NGOs, universities, indigenous public research institutions, multinationals, private donors, and organizations to which NOTAP can play a role in technology transfer.

4. Develop research and patent databases. Consider developing more fully NOTAP and the Nigeria Patent Office's relationship that can encourage the development and commercialization of local research. Involve NOTAP in both assisting with technology transfer and patenting any novel designs.

5. Consider educational workshops on the legal aspects of technology transfer and assistance, and technical training via international partnerships that will help to enhance Nigeria's technological capacity. It may also be in the interest of government and NGOs to work closely with local research units on these issues.

7. Case Studies and Models

We present two case studies that may be helpful for Nigeria's long-term ARV program. The first details ARV treatment and care in rural and resource-poor Haiti. The second is on the Brazil comprehensive universal ARV access program, which includes locally producing generic drugs.

7.1 Cost-effectiveness of Access to HIV/AIDS Drugs in Resource Poor and Rural Settings: Haiti HIV Equity Initiative

In Farmer et al. (2001), directly observed therapy with highly active ARV treatment (DOT-HAART) demonstrated that it is possible to carry out an HIV-treatment program in a poor community in rural Haiti, the poorest country in the Western Hemisphere. Relying on an already existing TB-control infrastructure, the authors provided DOT-HAART in combination with TB treatment, which was committed to free, uninterrupted care. Inclusion criteria and clinical follow-up were based on basic laboratory data available in most rural clinics. Serious side effects have been rare and readily managed by community-health workers and clinic staff.

DOT-HAART in Haiti is modeled on successful TB-control efforts. Each patient has an accompanying community health worker who observes an ingestion of pills, responds to patient and family concerns, and offers moral support. Social support, including assistance with children's school fees and transportation to and from clinics, are included in the services offered. Additionally, monthly meetings, in which patients discuss their illness and other concerns, are notable for high attendance. Response to DOT-HAART was dramatic in Haiti. As elsewhere, there was less likelihood for hospital admission than for patients with untreated HIV.

The Haiti HIV Equity Initiative offered ARVs to

- Pregnant women to block MTCT;
- Three-drug combination (AZT, 3TC, and a protease inhibitor or two NRTIs and NNRTI) to victims of rape or professional injuries; and
- Long-standing HIV patients.

Of women who were offered HIV testing, 90 percent accepted it after AZT was made available free-of-charge. Demand for HIV testing and opportunity for counseling have risen since HAART was made available. Guidelines for inclusion in DOT-HAART include

- Absence of active TB
- Recurrent OIs difficult to manage with antibacterials or antifungals
- Chronic enteropathy with wasting
- Otherwise unexplained and significant weight loss
- Severe neurologic complications attributable to HIV
- Severe leukopaenia, anemia, or thrombocytopenia

According to Farmer et al. (2001), all these guidelines allow one to predict survival and disease progression in HIV infection. Inclusion criteria need not be based on tests and measures that are unavailable in rural clinics and poor countries. Rather, they are based on case detection through the monitoring of symptoms. In the United States, there is the promising possibility of an AZT, 3TC, and Abacavir combination. Such a fixed-dose combination would make DOT-HAART significantly simpler than TB treatment and would reserve PIs for cases of suspected or documented treatment failure. Drug resistance is far less likely to emerge when combination therapy is used from the onset and drugs are made available to those who need them.

Leaving HIV/AIDS untreated is costly. Among the costs of not instituting treatment are passage of the infection to unborn babies; capital cost of increasing hospital infrastructure to accommodate increased number of admissions; increased spending on hospital staff; reduction of effective manpower hours and human resource power in all sectors of the economy, especially for high-risk population; loss of trained human resources; reversal of economic fortunes of the nation; social and societal burden of orphans; and creation of a financial detriment to many industries particularly agriculture. Those who are unable to pay remain sick and often infectious and can easily acquire resistance to first-line drugs. Also, limited medical knowledge can lead to interrupted treatment and self-medication (Colebunders et al., 1997).

Recommendations

As the government of Nigeria is currently making efforts to significantly scale up capacity to meet the needs of a broad access HIV/AIDS care and support framework, the Haiti HIV Equity Initiative might provide a good model for Nigeria, particularly for long-term sustainability for resource-poor and rural areas. We make the following suggestions, but short- and long-term costs should be considered for any wide-scale program.

1. The NTBLCP has a well-organized distribution and storage system for drugs. In addition, it has a well-established reporting, monitoring, and evaluation system. Psychosocial and medical care and support are in place. The existing program is well-funded by NGOs and international organizations that provide drugs, equipment, laboratory reagents, transport, logistics, and running costs, while the federal government provides infrastructure and pays salaries. WHO and the International Union Against Tuberculosis and Lung Disease (IUATLD) provide technical support. Consider such a model for long-term ARV treatment, and/or consider launching DOT-HAART at the community level in conjunction with the TB program, as both require monitoring and a multidrug regimen. Given that HIV is the main driving force behind the current TB epidemic and that TB is an OI of HIV, an integrated TB/HIV approach with ARV drugs could provide greater success. Also, the problem of stigmatization could be reduced in a joint control approach. Key elements that can be considered for a joint TB and HIV program approach include the following:

    - *Government commitment*. Nationwide coverage with central technical leadership needs to be integrated into the NTBLCP with regional units; which, moreover, can be built into PHC. ARV drugs should be packaged with voluntary testing, psychological

support, palliative care, home-based care, treatment and prevention OI, and nutritional support. Financial commitment needs to be steady and generous.

- *Detection through passive case finding and symptom monitoring*. Health workers could use simple criteria for assessment, as long as the provision of high-quality drugs (without threat of shortages) corresponds with DOT-HAART and other helpful social interventions. The spectrum of illness and clinical features would need to be worked out. For example, patients fulfilling the WHO case definition for AIDS in Africa, or patients with common systemic diseases such as TB, pneumonia, chronic diarrhea, bacteria, or systemic fungal infections, could be considered candidates if tested HIV-positive. Early therapy for symptom-free patients has been associated with side effects, poor compliance, and development of resistance.

- *Standardization of TB and ARV programs*. Drug combinations need to be simple and have the least side effects. PIs are associated with many side effects and can adversely interact with TB drugs. Proper case management, with supervised administration of tablets (DOT), better ensures patients' adherence. This would work if the site of administration is close to patients' homes and supervisors are trusted and reliable. Standardized programs need to be built into PHC regimes. After ARV Plan of Action clinical trials are complete, standard care guidelines should be developed.

- *Develop and implement care and support initiatives in order that there is little strain on the patient to get needed treatment*. If patients experience chronic financial strain, therapy participation may be lacking. It is imperative that simple and easy methods of financial and emotional support be carried out. Government and NGO care and support projects would work best if the following is considered as care and support "packages": bags of rice and *gari* for patients to take home; transport fare; money for children's school fees; opportunities that integrate work, training, programs, and additional income projects; support groups; home visits; individual counseling; and empowerment programs that, for instance, increase PLWHA's participation in advocacy and education programs. These are suggestions that may or may not be appropriate. The point is that any medical care program will necessarily need to integrate forms of social and financial interventions that may have both universal and differing features across communities. We emphasize that great care must be taken in assessing patient needs in order that appropriate programming can take place.

- *Establish a system of regular drug supply and drug distribution with auditing mechanisms*. Building on the structures used in TB control programs, a mechanism needs to be set up for regular and uninterrupted procurement, distribution and safe storage of ARV drugs. Ultimately, but not initially, this requires a revival of the DRF, good and fair implementation of the NHIS, streamlining and sanitization of drug distribution channels, and attempts to eliminate counterfeits, particularly counterfeit drug markets.

- *Establish and maintain a monitoring and auditing system*. In each treatment unit, an ARV and TB register should be maintained to record individual patient information.

Regular reporting of quarterly results of case findings and follow-up are necessary. The same recording and monitoring system should be set up for drug dispensation and usage. Yearly auditing of human and financial resources is highly encouraged.

Possible Framework for a Joint TB/HIV Program

We suggest the following measures that can help to ensure sustainability (note that all parties need to be adequately trained in every aspect of the program in terms of community and overall medical and social administration). Again, these are long-term recommendations:

1. A central unit with an overall program manager with two deputies (one for TB and one for HIV).
2. Regional TB and HIV officers.
3. Program steering group made up of senior FMOH personnel, director of a national AIDS control program, technical experts, and donors.
4. Joint program manual that expands the TB program.
5. A recording, reporting, and auditing system.
6. Each treatment unit should have at least two coordinators responsible for implementation of the program. With specific reference to ARV therapy, this would involve registration of patients, maintenance of confidentiality, administration of drugs, patient education, recording and reporting on cases, drug ordering and drug security. A doctor should be in place for ward administration, monitoring, managing, and referral services.
7. Team of trained counselors and nurses.
8. Testing services.
9. Regular supplier of ARV and TB drugs and diagnostic materials.
10. Supervision and annual plan for both central and regional supervision.
11. Long-term program plan with all stakeholders and donors.

7.2 Joint Local Manufacturing and Administration/Monitoring of ARVs: Brazil

Brazil has implemented a policy that provides universal access to ARV treatment. This has been achieved through the manufacture of generic medicines (ARVs and others) with substantial government investment. Brazil has implemented production, distribution, and rational use activities and programming, which are all coherently connected via policy. According to MSF (Perez-Casas and Boulet, 2000b) and the Brazilian government, the following results have occurred:

- Price of ARV medication has dropped by 72.5 percent on average since 1996 (in contrast, prices of imported drugs declined by an average of 9.6 percent).
- More than 85,000 people have been put onto the treatment program.
- HIV/AIDS deaths have been reduced by approximately 50 percent since the policy was implemented.
- Quality of life of PLWHA has improved significantly.

The Brazilian government set up a pharmaceutical company called FarManguinhos, which conducts research into producing raw materials for drugs. The company transfers this information to other companies, which produce the raw materials. FarManguinhos negotiates the price of the raw materials and purchases them from the producers. The company then produces the final products.

Like Nigeria, Brazil is a federation that is divided into states. Some of the states in Brazil have set up public pharmaceutical producers. In addition to the public companies, there are private ones that research, develop, and produce generic medicines. These companies purchase some raw materials internationally from India, Japan, Korea, and China. The MOH purchases about 40 percent of its medicines from FarManguinhos, with the remainder purchased through open international tenders. Private and state-run Brazilian companies as well as multinational pharmaceutical companies compete for these tenders.

In Brazil, companies are legally obliged to explain how their drug prices are calculated. FarManguinhos is responsible for calculating the price of medicines for the MOH. These prices usually include a 10-percent mark-up, which FarManguinhos uses to reinvest into the company. All other companies have to make their HIV/AIDS drugs the same price as FarManguinhos when they sell them to the MOH.

The government created

- A policy of universal access to HIV/AIDS treatment and, in particular, ARV treatment.
- Extensive STI and AIDS prevention and care facilities.
- HIV/AIDS MTCT prevention program.
- National laboratory network for conducting CD4 and viral load counts.
- National system for ensuring the quality of the laboratory testing facilities.
- Extensive care facilities and procedures.
- Monitoring of patient take-up rates of HIV/AIDS treatments.
- National computerized system for drug control, which monitors dispensing and automatically detects and corrects incorrect prescriptions.
- National computerized system for monitoring laboratory tests.

Brazil has an extensive care network outside of conventional hospitals:

- 145 specialized care centers in which a team of a doctor, dentist, nurse, psychologist, and social worker provide care and support to patients and their families.
- 66 day hospitals that provide medication, diagnostics, and minor surgery to patients who do not require hospital admission.
- 50 home therapeutic care units that provide an alternative to patients needing to be hospitalized. These involve the family in treatment and reduce the pressure on hospitals.

According to the Institute of Economic Research Foundation at Sao Paulo University, this system has reduced costs and improved patient outcomes.

According to the Brazilian MOH, there are a number of reasons for its mostly successful fight against the HIV/AIDS epidemic.

- Brazil responded early to the epidemic. It has taken positive action against HIV/AIDS since the mid-1980s.
- There is substantial cooperation, though not without conflict, between the Brazilian government and civil society. Civil society plays an essential role in prevention programs and treatment access initiatives.
- There is substantial cooperation between Brazilian and international institutions. This takes place at many levels with many countries, both rich and poor, resulting in the development of skills and knowledge among health care personnel and civil society organizations.
- A World Bank loan of US$325 million has been successfully used to finance HIV/AIDS and STD activities.

The Brazilian government has stated that it is willing to help other countries with technical assistance and training in the development of generic ARVs, which Nigeria should seriously consider.

Recommendations

1. Although ARV cannot be currently manufactured in Nigeria, consider the same drug distribution system that is tied to a well-coordinated network of medical and social care for PLWHA similar to Brazil's program.

2. In the long-term, contact Brazilian government (as well as others such as Thailand and India) regarding offers they have made for technological assistance, training, and transfer for manufacturing ARV. Assess the possibilities of manufacturing ARVs and drugs for HIV-related opportunistic infections with Brazil's help.

8. Conclusion

This consultancy was designed to address the socioeconomic, legal, and policy conditions for accessing HIV-related drugs for PLWHA in Nigeria. We found that the proprietary ARVs and drugs for OIs are expensive and out of reach for the average income-earning Nigerian. Even with drug price reductions offered by global companies, prices are still very high in Lagos State, where they are primarily available. Recently, the WHO has endorsed the use of generic brand ARV and OI drugs. The government of Nigeria purchased enough generic drugs from India to run clinical trials as the initial phase of a national plan for broad access to ARV. As several different triple combination therapies are becoming increasingly available, access to ARV, within a well-coordinated framework, seems promising.

HIV/AIDS and health policies are well conceptualized with some exceptions. There is a gap between HIV/AIDS programming and making HIV/AIDS policy, mostly due to the rapid pace of foreign aid and HIV/AIDS intervention in the last two years. Currently, there is a need to develop an overall policy framework that addresses legal aspects, programming, drug distribution, quality control, and rational use pertaining to HIV/AIDS. Additionally, we found that many of the policies are under review, which presents a significant opportunity to conceptualize HIV/AIDS in all health care policies. Significantly, creating consistent implementation of the policies needs to be worked out, perhaps via review committees and needs assessment studies.

Pharmacy and regulatory laws are well conceptualized; however, there is some overlap that needs to be streamlined (with the help of an attorney). Importantly, these laws are rarely enforced. In some cases, punishment mechanisms may not be a strong enough deterrent to fraudulent activity. Enforcement mechanisms, such as the police and legal apparatus, need review for considering how to better implement the law.

Implementing the law in a consistent and fair manner is extremely important to the distribution of drugs and quality drugs. There is a chaotic drug distribution system in place with large numbers of illegal outlets. These illegal premises in the drug distribution chain are the primary sources of substandard and counterfeit drugs. The existence of fraudulent and/or substandard drugs (about 48 percent of available drugs in Nigeria) leads to serious concerns about safe and efficacious access to drugs. Also, there is an uneven distribution of pharmacy premises, whereby every state has a dearth of pharmacies in rural areas and most states have few pharmacies in urban areas. In hospitals, pharmacy premises are not well organized, and recovering revolving drug fund costs can take two years. These distribution practices have led to both erratic drug supplies and drug shortages. Developing measures that alleviate underserved areas is needed. There is concern that access to drugs for HIV/AIDS, as well as OIs, could not be well monitored in the distribution chain, leading to possible problems with counterfeits, as well as concerns about resistance, especially to ARV. Implementing and enforcing the law could possibly alleviate most of the problems associated with drug distribution and quality drugs.

In terms of rational drug use, there is a high level of self-medication among all strata of society. Pharmacists often prescribe drugs that are not labeled (as a matter of policy), and there

exists little education for patients by medical workers on rational drug use and the purposes of drug treatment regimens. Massive public education on rational drug use must be considered, especially of drugs for HIV-related infection.

Nigeria has yet to comply with the TRIPS Agreement. The Nigerian patent law is currently under review and will be overhauled in order for it to comply with the WTO. There are few in government or elsewhere that understood the significance of global intellectual property laws and how they will have an impact on the access to drugs. It is important not only to comply with TRIPS using all health care safeguards available, but also to educate all stakeholders—government, NGOs, PLWHA, research institutions, and private companies—on TRIPS's impact on drug accessibility. Also, it is important to streamline pharmacy and regulatory laws in order that Nigeria can become TRIPS compliant with health care safeguards in tact.

We provided two case studies in this report, which were meant to serve as models for long-term ARV treatment and care. The first discusses an ARV program in a rural and poor community in Haiti. It was jointly tagged to an existing TB infrastructure and proved to be successful. Because the national TB program in Nigeria has a good infrastructure and data/information system, Nigeria could consider a similar project for long-term ARV and TB administration and monitoring. The second discusses a well-coordinated network of drug manufacturing, medical and psychosocial care, and support services that are free to PLWHA in Brazil. Although Nigeria does not have the capacity to produce ARV at this juncture, there can still be consideration for this model of care and support that is built into a multilateral network of medical institutions, drug supply and distribution, and community and home-based care.

9. Final Recommendations

9.1 Drug Prices

1. Because the government of Nigeria embarked on a program for broad access to ARV drugs, price studies of existing drugs and newly marketed generic products should continue to be researched (such studies are usually carried out by the WHO or UNAIDS).

2. Research how other cost-drivers, such as VAT, duties, high mark-up, and so forth, contribute to the overall price of drugs and consider ways of offsetting the cost of drugs.

3. Determine long-term sustainability of HIV-related drugs as well as government and other modes of subvention.

9.2 Health Care Policies

1. Consider devising an overall HIV/AIDS policy that includes all aspects and issues pertaining to HIV/AIDS: programming, legal instruments, access to drugs, drug distribution, quality assurance, treatment guidelines, law enforcement, drug-purchasing mechanisms, clinical trial protocols, and so forth. This may include linking other existing policies to an overall plan. Additionally, government communication and accountability needs to be improved on all these issues.

2. *Plan of Action for Broad Access to ARV*. Consider measures that ensure controlled drug distribution as well as measures that ensure quality control, including deterrents for possible counterfeits.

3. *HEAP*. Consider including a statement on access to drugs. Perhaps make policy links to the Plan of Action.

4. *NHP*. Consider including measures that implement the Abuja Declaration into the NHP. Also, measures should be considered for long-term phasing in of HIV/AIDS medical care and support to the PHC system.

5. *NDP*. Consider best treatment guidelines for ARV administration and monitoring, and devise ways that create greater drug accessibility.

6. *EDL*. Evaluate ARVs and drugs for OIs and consider their inclusion on the EDL.

7. *DRF*. Consider reviving the DRF in states where it currently does not exist and improve its operations. Consider including ARV and OI drugs.

8. *NHIS*. Consider advocating for the general inclusion of PLWHA into the NHIS that may eventually want to consider forming cooperative societies for the HMO framework. Create a more significant role for pharmacists in the NHIS.

9.3 Pharmacy Laws

1. Review all enforcement mechanisms that pertain to regulatory bodies, police, and courts, including evaluating budget constraints. Devise ways to consistently enforce the law.

2. Consider soliciting the aid of lawyers to review and recommend ways to streamline all the laws and decrees as a whole.

9.4 Regulatory Issues

1. Regulatory agencies need adequate budget allowances in order to carry out their work. Perform needs assessments of both PCN and NAFDAC and properly define mandates that avoid overlap.

2. Devise cost-effectives ways to increase quality control monitoring and capacity. Evaluate any constraints.

3. Evaluate GMP guidelines and check for compliance with international norms and levels of certification. Evaluate any constraints.

9.5 TRIPS Compliance

1. Sensitize health, commerce, justice, and trade ministries, government ARV program team members, NACA, PLWHA/AIDS NGOs, and members of the local pharmaceutical industry on intellectual property law and its impact on access to drugs. Get continual updates on the intellectual property bill's progress.

2. Comply with TRIPS by incorporating parallel importation and Bolar exceptions into Nigeria's patent law. Do not include "TRIPS-plus" in the new law. Consider eliminating power of attorney for NAFDAC product registration requirements, since it may hurt parallel importation and expand national exhaustion to global exhaustion of IPR.

9.6 R&D

1. Consider developing a research and development policy that considers long-term commercialization of local research. Evaluate cost of R&D, including cost-effectiveness of importation versus local manufacturing.

2. Consider ways that help Nigerian businesses benefit from technology transfer (NOTAP) (as outlined in TRIPS and other international agreements), including consulting with other countries that have offered technical support and assistance.

9.7 Rational Use and Drug Treatment Protocols

1. Consider wide-scale education on drugs and their purpose, as well as drug treatment regimens. Consider eliminating the practice of not labeling drugs. Increase patient education and consider assisting the self-medicating population, involving pharmacists.

2. Consider measures to improve the management of controlled drugs.

3. Follow up on current (and past) clinical trials by adopting evidence-based treatment guidelines that favor minimal cost, effective responses, patient compliance, less side effects, good tolerance, and less possibility of resistance. Build in multiple second-line treatment therapies to ensure a rapid medical response to any signs of resistance.

9.8 Drug Distribution

1. Consider forming a committee that evaluates the constraints of enforcing drug laws dealing with distribution. Consider ways to end drug shortages.

2. Consider measures that dismantle open drug markets and the short- and long-term costs of taking such measures.

3. Consider measures that can help to increase pharmacy practices where there is a dearth of services (especially for rural areas), bearing in mind all constraints. Consider tagging pharmacy premises to other national health programs.

9.9 Quality Drugs and Quality Control

1. Critically examine the entire legal framework to ensure that there are no loopholes for counterfeiting. Define and control the legitimate drug market and the drug distribution system before effective control can be applied to illegal trade and counterfeiting. Designate the points through which pharmaceuticals can be imported or exported.

2. Equip, staff, and fund the inspectorate in NAFDAC and PCN.

3. Determine NAFDAC's financial and human resource needs to carry out quality assurance and control activities. Ensure proper distribution of funds.

4. Develop general GMP guidelines that enable both manufacturers and regulatory bodies to be in constant dialogue with each other.

9.10 Local Manufacturing

1. Consider forming an investigative committee to determine current capacity for research, development, and manufacturing.

2. Explore joint collaborative efforts with NGOs, universities, indigenous public research institutions, multinationals, private donors, and organizations, to which NOTAP can play a role in technology transfer.

3. Develop research and patent databases. Consider educational workshops on the legal aspects of technology transfer and assistance.

9.11 Access to Drugs: International Models

1. Consider a joint TB-HIV/AIDS framework (one that similar to Haiti's model) that extends the government's Plan of Action for ARV care and support in the long term.

2. Although ARV cannot be currently manufactured in Nigeria, consider the same drug distribution system that is tied to a well-coordinated network of medical and social care for PLWHA similar to Brazil's program.

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