WORKING PAPER NO. 65

CONSUMPTION AND TRADE IN OFF-PATENTED MEDICINES

HARVEY E. BALE

MAY, 2001

INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS
Core-6A, 4th Floor, India Habitat Centre, Lodi Road, New Delhi-110 003

CONSUMPTION AND TRADE IN OFF-PATENTED MEDICINES[1]

HARVEY E. BALE*

[1] This research has been funded by a WHO grant and produced by the Commission on Macroeconomics and Health (CMH).

* The views expressed in the paper are solely of the author.

Contents

Foreword

This paper is part of a series of research papers prepared for the Working Group on Health and International Economy of the Commission on Macroeconomics and Health (CMH). The Commission was set up in January, 2000, by the Director General, World Health Organisation, under the Chairmanship of Prof. Jeffrey Sachs. As a member of the CMH and Co-chairperson of this Working Group, I have had the privilege of commissioning research papers on issues of importance for health and the international economy.

This paper by Dr. Harvey Bale, Director-General, International Federation of International Pharmaceutical Association & President Pharmaceutical Security Institute, Geneva, spells out the problems relating to the access to older, patent-expired essential medicines in developing countries. The author highlights spending priorities, inadequate infrastructure for public health care, inadequate external financing and insufficient political commitment as the crucial barriers to improving access to quality health care in developing countries. The paper is bound to be controversial given the sensitivity of the issues raised. But an integrated approach to quality health care makes it necessary to address these problems along with the problems emerging from the TRIPs regime and globalisation. I hope that the analysis in this paper serves to improve the quality of informed debate and discussion.

A comprehensive, thorough and very illuminating discussion of the relevant issues in this paper is very welcome at this stage when affordable access to lifesaving patented medicines has become a subject of major concern.

Isher Judge Ahluwalia
Director & Chief Executive
ICRIER

May 2001

1. Introduction

Much focus seems to be on the concerns about reduced access to newly patented medicines in light of changes in technology (improving research techniques but rising costs of research) and the spread of stronger patent legislation worldwide over the past two decades – as well as the forthcoming global application of the WTO TRIPS agreement. Experience in most developed countries, however, suggests that probably the usage rate of patented medicines will remain low in developing countries – perhaps well below 10% -- for many years to come. Meanwhile, the fact remains that access to older, patent-expired essential drugs remains poor and is a very serious threat to public health –yet this situation appears not to be on the road to making substantial progress.

Certain diseases are targeted through the joint efforts of international agencies and industry -- including such areas as river blindness, malaria, trachoma, lymphatic filariasis, etc. However, it remains the case that disease categories including measles, acute respiratory infections, malaria, diarrheal diseases, TB, yellow fever and others remain major sources of mortality and morbidity in developing countries. And these diseases are curable or preventable by the use of inexpensive, off-patent medicines or vaccines.

As many people in developing countries do not have access to life-saving quality medicines, improving access to these medicines, or failing to do so, points out the challenges not only of substantially improving living standards in developing countries, but also points to a probable failure to utilize effectively and widely newer medicines

against the main killer diseases of the third world. Thus we cannot ignore the problem of access to off-patent drugs. They are the main solution to improving health care in many developing countries, especially the poorer ones.

There are, of course, many deep-seated social, economic, political and administrative issues and policies that can account for the lack of access to total health care goods and services; and today's focus on access to newer, patented drugs reflects a an approach that is likely to fail unless the experience with medicines that have existed for many decades – and are very inexpensive – learned and reflected in health care and development policies.

2. Background

According to WHO sources, at the beginning of the 21st century an estimated one-third of the world population still lacks regular access to essential drugs, with this figure rising to over 50% in the poorest parts of Africa and Asia[1]. The fact that essential drugs remain to this day unavailable, unaffordable, unsafe, or improperly used in many parts of the world should be a matter of great concern to the international community.

A WHO report on TB treatment levels illustrates the problem. The following table shows the varying levels of access among various countries to the WHO-recommended DOTS (directly-observed treatment short-course) TB therapy. This treatment involves

[1] WHO. WHO medicines strategy 2000-2003: framework for action in essential drugs and medicines policy. Geneva: WHO. 2000

old, off-patent drugs and a treatment that cures patients typically costs in the neighborhood of US $10 per patient.

Percentage of People with TB Having Access to DOTS Therapy

	1998	**1999**
Bangladesh	90	90
Brazil	3	7
Cambodia	100	100
China	64	64
Congo - Kinshasa	60	62
Ethiopia	64	63
India	9	14
Indonesia	80	90
Kenya	100	100
Nigeria	45	45
Pakistan	8	8
Peru	100	100
Philippines	17	43
Russia	5	5
South Africa	22	66

Tanzania	100	100
Thailand	32	59
Uganda	100	100
Vietnam	96	99
Zimbabwe	100	12

Source: World Health Organization. *Global Tuberculosis Control. WHO Report 2001*. Geneva, Switzerland, WHO/CDS/TB/2001.287

The table shows an astonishing array of treatment levels, with Brazil, India, Nigeria, Pakistan, Russia, and (in 1999) Zimbabwe showing DOTS treatment levels of less than 50 percent. The results here are illustrative of the access situation in developing countries going beyond TB. According to recent media reports World Bank staff estimate that many millions of premature deaths arising from infectious disease could be avoided with sound, coordinated initiatives: 900,000 from TB, 500,000 from malaria, 3 million from diarrheal diseases, and 1.6 million from measles and other diseases preventable with inexpensive vaccines.[2]

The difficulties which countries have in providing access to these drugs for their populations clearly suggests that there is no single factor (e.g., drug prices) that constitute the barrier to essential drugs. With generic versions of previously patented medicines available for TB and the other main killers of people in the developing world (with the

exception of HIV/AIDS), the role of patents needs to be put into the context of many other, more important factors behind the lack of drug access. These barriers lie in spending priorities, inadequate infrastructure, lack of needed external financing and insufficient political commitment to providing access to quality health care.

3. The WHO Model Essential Drugs List

A key element in the issue of access to non-patented medicines is the WHO Model Essential Drugs List, which is the main internationally recognized list of medicines considered to be essential for the majority of the populations of countries, especially developing countries. According to WHO, 95% of products on the EDL are off-patent. The EDL concept focuses on those drugs that represent the best balance of quality, safety, efficacy and cost for a given health setting. Basic health systems such as those to be found in most developing countries recognize the therapeutic and economic benefits of such an approach, with drug selections regularly updated with additional products in light of new therapeutic options, changing therapeutic needs and better drug quality. Scientific advisors working on the WHO Expert Committee on Essential Drugs select drugs which comply with the above concept. When evaluating the possibility of adding another drug to the EDL, the WHO Technical Committee inevitably considers the drug's total cost. The absolute cost of a drug comprises several factors, ranging from the initial financing of the venture to the actual production of said drug, plus distribution costs, which must also be taken into account. Moreover, once the drug has been selected for the EDL, people in need living in developing countries must cope with other costs such as tariffs and duties

[2] Washington Post, 1 May 2001, page A18.

for imported products (please see attached tables), national taxes and local taxes. These factors can play an important role in the final price to consumers, where the ex-manufacturer price may be only a small fraction of the end-user price.

4. Access and Trade in Pharmaceuticals Among Developing Countries

The main factors that prevent a better access to essential drugs in developing countries include inadequate financial resources, weak healthcare structure, a lack of drug legislation and policy and the prevalence of self-medication[3].

Drugs that form an important part of healthcare delivery in developing countries are not available to the majority of the population living there because of, amongst other problems, inadequate financial resources[4]. Indeed, the overall health spending in the least developed countries is very low, even reaching US$2/capita per year in some such nations. Thus, for the poorest countries, there are not the resources available domestically to support access to quality health care for their populations.

Furthermore, another major complication must be dealt with when --- if not before --- addressing the subject of access to drugs, i.e. that of weak healthcare structure: in rural areas where even the access to medical centres is limited and selective. There are two major types of health facilities in most developing countries: referral hospitals (RH) and

[3] Bapna JS, Tripathi CD, Tekur U. Drug utilisation patterns in the Third World. PharmacoEconomics 1996 Apr; 9 (4): 286-294.
[4] Lee D, Balasubramaniam K, Ali HM. Drug utilisation studies: their transferability between industrialized and developing countries. In: Dukes MNG, Editor. Drug utilisation studies: methods and uses. WHO regional publications, European series, No. 45. Copenhagen: WHO, 1993: 193-218.

primary health centres (PHC). Normally, patients are expected to visit their nearest PHC in the first instance, from where they may be referred to an RH, which is generally situated in a more urbanized area. However, due to an inadequate and irregular supply of medicines to PHCs, RHs are overloaded. For example, most of drugs in developing countries are diverted to urban areas, regardless of the fact that most inhabitants of these same countries live in rural areas. The overloading of RHs is one of the commonest causes of malfunction in the health services of developing countries[5].

Adequate financing is another key issue for access to drugs. While many observers of the access situation have focused on "affordability" of drugs as a barrier to access, it must be noted that affordability actually has three components: the cost of the drug itself; the costs of effectively distributing, administering and monitoring its use; and the financing to pay for the first two elements. Of these factors, the price of the drug itself can often be the smallest, according to a WHO study of administering nevirapine in South Africa, which noted that the cost of the drug was about 0.1% of the entire cost of administering the drug program. (This was before nevirapine's manufacturer, Boehringer-Ingelheim, announced that it would donate the drug free of charge to developing countries.) Furthermore, the poorest countries that have very limited resources for supporting access to quality healthcare require external financing from bilateral or multilateral donors.

[5] Bapna JS, Tekur U, Pradham SC, et al. Why patients prefer referral hospitals. World Health Forum 1989; 10: 37-40. Also please see: A Report on Allopathic Medicines, Volume One. New Delhi: The Institute for Indian Public Opinion: September 2000.p.29

Tariffs can be an especially important factor in determining the end-user price for developing countries. While almost all industrialized countries have zero tariffs on pharmaceuticals, many developing countries still have import duties and tariffs on these products. Developing countries, which have three-quarters of the world's population, produce less than 10% of the world's total pharmaceutical output and account for less than a quarter of the annual global expenditure on drugs. Only only a few countries such as India, the Republic of Korea, Egypt, Argentina, Brazil and Mexico produce two-thirds of pharmaceutical output in the Third World.

Thus, trade in pharmaceuticals among developing countries in pharmaceuticals, as well as between industrialized and developing countries, is a very important part of the access issue. Exports of pharmaceutical products are highly concentrated among developing countries, with China, Hong Kong, India being the leading suppliers to other developing countries. Tariffs at the high end of the spectrum are on average upwards of 30 percent in some countries, including Burkina Faso, Pakistan, India, Tanzania and others. (See the annexes attached for more information regarding trade flows and tariff levels of developing countries.)

Some countries have the resources for improving access to healthcare but do not sufficiently allocate resources to make this improved access possible. Insufficient political will to place access to quality health care as a high priority for resources is a very important obstacle to access. For example, governments of some countries particularly affected by the AIDS pandemic have increased military spending and activity while

decrying a "lack of funds" for AIDS prevention and care. A further indication of a lack of political will is the lack of drug legislation and policy in most developing countries. A great number of these countries have not drawn up an essential drug list for implementing assurance of quality, safety and efficacy. Among the 104 developing countries identified by WHO, only 25% have a drug policy in place, 41% are currently developing a policy aimed at improving the availability of essential drugs, and the remainder are either considering the implementation of some form of drug policy or have no interest in it[7].

The prevalence of self-medication in developing countries is also a source of concern, particularly due to the great need for patient education on drugs. In some developing countries, potentially harmful drugs such as chloramphenicol and dipyrone which are frequently used without seeking medical advice beforehand[8] In Brazil, for example, a household survey in 1987 reported that 75% of drugs taken were on the United Nations list of banned or withdrawn products[9].

5. The problem of counterfeit drugs

Counterfeiting of pharmaceuticals is yet another important, and potentially dangerous, aspect of access to basic drugs. Trade in counterfeit drugs is widespread internationally and affects both developing and developed countries. The spread of counterfeit drugs is generally more pronounced in those countries where the manufacture,

[7] WHO. The World drug situation. Geneva: WHO. 1988.
[8] Price L. In the shadow of biomedicine: self medication in two Ecuadorian pharmacies. Soc Sci Med 1989; 28 (9): 905-15, and
Sekhar C, Raina R, Pillai G. Some aspects of drug use in Ethiopia. Trop Doc 1981; 11: 116-8.

importation, distribution, supply and sale of drugs are less regulated and enforcement may be weak. They can be imported, smuggled or manufactured locally by large factories and establishments equipped with the most modern equipment, or by small-time operators in smaller, often poorly equipped facilities[10]. National drug distribution channels have been established by law in many countries to ensure that the nation's drugs are of the correct quality, efficacy and safety. Unfortunately, these channels are sometimes undermined and infiltrated so that counterfeit products have been found alongside genuine drugs in legitimate channels, as well as in the illegitimate markets that exist in many developing countries.

Under no circumstances are counterfeit drugs equivalent in quality, safety and efficacy to their genuine counterparts. Even if they are of the correct quality or contain the correct amount of active substance, their production or distribution are not known to the drug regulatory authority (DRA) of the country concerned. This means that any associated defects and harmful reactions are not easily recognized or monitored and, if needed, an effective product recall is practically impossible. Counterfeit drugs are definitely dangerous and detrimental to public health in terms of human suffering and burden on health services. In extreme cases, counterfeit drugs may cause serious harm to health or exacerbate the conditions being treated because of the harmful ingredients they may contain. For example, cough syrup contaminated with diethylene glycol has caused the

[9] Haak H. Pharmaceuticals in two Brazilian villages: lay practices and perceptions. Soc Sci Med 1987; 27 (12): 1415-27.
[10] WHO. Guidelines for the development of measures to combat counterfeit drugs. Geneva: WHO.1999.

death of more than thirty children in India[11]. As a consequence of such damaging effects, counterfeit drugs may erode public confidence in health care systems, health care professionals, the suppliers and sellers of genuine drugs and the pharmaceutical industry. Incorrect labelling as to source can also be detrimental to the reputation and financial standing of the original and/or current manufacturer whose name is being unlawfully used. Therefore, in order counteract the proliferation of counterfeit drugs, all countries, and particularly developing countries, need to implement an appropriate legislation which actively utilizes patent systems. Adequate product patent protection on the long term improves the credibility of local manufacturers by ensuring that their output responds to international quality standards, thereby reducing the local cost of disease through a better quality drug therapy.

In light of the fact that counterfeits are of such general concern, a multisectoral task force on counterfeit and substandard drug issues has been formed by WHO, IFPMA the International Pharmaceutical Generic Alliance, the World Self-Medication Industry, and Pharmaciens Sans Frontières. This task force held an awareness-raising event on this issue at the 2000 World Health Assembly and is working on a joint action plan to improve awareness of the problems of counterfeit and substandard drugs worldwide. This is an issue, however, that continues to need greater attention in terms of building awareness and improving control. One mechanism that will help is the institution of the anti-counterfeiting provisions of the WTO TRIPS Agreement. (cf. TRIPS Art.51, which

[11] Singh J, Dutta AK, Khare S, et al. Diethylene glycol poisoning in Gurgaon, India, 1998. Bulletin WHO, 2001, 79: 88-95.

defines what counterfeit goods are and Art. 61 which directs member states to institute criminal penalties for counterfeiting).

6. The problem of procurement practices

Procurement and monitoring practices are of primary importance when dealing with the issue of access to drugs in developing countries. Procurement is the sum total of processes involved in the purchase and delivery of drugs. In accordance with the EDL concept, the most cost-effective drugs are bought in the most appropriate quantities from reputable suppliers, delivered where and when required, at the lowest possible total cost. National governments of developing countries are therefore called to implement more effective drug procurement systems in order to guarantee regular access to good quality essential drugs. However, the current situation in many developing countries is far from being satisfactory and cases of improper procurement practices have been reported[12]. Improper procurement practices are a definite matter of concern for they can lead to high prices, poor quality, and are likely to even result in shortages of life-saving drugs. For example, a lax drug procurement system can lead to national shortages of one or two drugs which are essential in a four-drug treatment against tuberculosis; treatment failures increase and resistance can quickly develop to the drugs still in stock[13].

The number of agencies involved in procuring drugs can render the process even more complex and vulnerable to efficiency and waste. Other problems such as corruption

[12] Rolt F. Editor. Policies and profits. London: War on Want, 1985.
[13] Statement attributed to Dr Hans Hogerzeil, WHO, taken from *Better quality at lower prices*, WHO EDM website.

and lack of transparency lead to lack of competition with fewer choices, poorer quality and higher prices. At the same time, irregular and limited funding can greatly hinder efforts to secure timely delivery of drugs. External funding from international agencies or donors sometimes helps but cannot be considered as a long-term solution. Outdated local regulations and supply procedures not suitable for the special requirements of buying pharmaceuticals can further complicate the issue.

Monitoring of drug use in a country provides important information as to whether access to drug planning and strategies are satisfactory or whether they need to be modified or even reworked. Monitoring is therefore crucial to successful implementation of national drug policies, programs and strategies, and to achieving a rational use of quality drugs. WHO and other organizations have determined pharmaceutical indicators, which are objective and standard measures for assessing and describing pharmaceutical sectors and activities. Moreover, they can be compared over a period of time and used to determine and assess pharmaceutical trends. The problem with respect to indicators consists in deciding what benchmark should be preferred. Some organizations have decided to compare data by specifically highlighting the drug cost factor, but such comparisons based only on price can be misleading. Any comparison of products must include comparing the drugs' quality, safety and efficacy.

7. Conclusion

Medicines have been developed and are currently effective against all of the major diseases that most impact the populations of developing countries. There are also good therapies available for many diseases that affect smaller, but significant numbers of people in developing countries (e.g., river blindness, polio, trachoma). While fears about access are focused on the future, and on patented medicines, access to non-patented drugs in developing countries is clearly inadequate, due in large part to the factors cited in this paper:

1) financing,
2) infrastructure,
3) lack of political will (prioritization),
4) corruption, and
5) counterfeiting.

In the field of HIV/AIDS these barriers are showing up a critical, given the donations and reduced prices of HIV/AIDS therapies available to developing countries. As one executive told me recently, "My company is offering an important drug to prevent the childbirth transmission of AIDS from mother to child *free of cost*, and yet I cannot give this drug away to more than a few countries!"

Addressing the key barriers to access and improving procurement and monitoring systems in developing countries is an important challenge for governments, bilateral

donors, and international organizations now and for the foreseeable future[14]. Unless these problems are better understood and resolved, it is highly unlikely that efforts to secure improved access to newer medicines will succeed – regardless of price considerations or patent status.

[14] For a more thorough review of access issues, with a special focus on anti-malarial drugs, please see the joint WHO-IFPMA paper entitled "WHO-IFPMA Action Paper: Improving Access to Essential Drugs through Innovative Partnerships", November 2000. A copy is available on a PDF file at www.ifpma.org.

ANNEX 1:

EXPORTS AND IMPORTS OF PHARMACEUTICALS FROM and TO DEVELOPING COUNTRIES

Top Ten Developing Country Exporters (in descending order of world exporters - 1996)	Amount of exports to industrialized countries (1998)	Amount of exports to developing countries (1998)
China	1079 (Million dollars)	592 (Million dollars)
India	288	576
Hong Kong, China	66	815
Mexico	304	410
Singapore	166	426
Israel	347	33
Argentina	25	277
Korea Republic	85	204
Brazil	64	183
Colombia	10	173

Top Ten Developing Country Importers (1998)	Amount of imports from industrialized countries (1998)	Amount of imports from developing countries (1998)
Brazil	1325 (Million dollars)	263 (Million dollars)
Mexico	955	109
Hong Kong, China	761	294
Argentina	638	139
Chinese Taipei	676	26
Singapore	522	69
Korea Republic	463	92
China	423	103
Israel	500	12
Colombia	294	202

Top Ten African Importers (1998)	Amount of imports from industrialized countries (1998)	Amount of imports from developing countries (1998)
South Africa	565 (Million dollars)	36 (Million dollars)
Tunisia	164	8
Nigeria	79	39
Kenya	78	27
Uganda	20	34
Senegal	49	2
Tanzania	19	22
Mauritius	32	6
Madagascar	13	3
Togo	13	1

ANNEX 2:

TARIFFS OF ACTIVE INGREDIENTS AND MEDICAMENTS IN DEVELOPINGCOUNTRIES

Top Fifteen Developing Countries with the Lowest Pharmaceutical Tariffs: Active Ingredients	
Costa Rica (1999), El Salvador (1998), Guatemala (1998), Hong Kong (1998), Libya (1996), Madagascar (1995), Nicaragua (1999), Singapore (1995), Sudan (1996)	0
Malaysia (1997)	0.2
Mali (1994), Viet Nam (1999)	0.3
Israel (1993)	0.7
Honduras (1999), South Africa (1999)	1
Uruguay (1999)	1.1
Mozambique (1997)	1.2
Chinese Taipei (1999)	1.5
Indonesia (1999)	1.7
Papua New Guinea (1997)	1.8
Panama (1998)	2.3
Morocco (1997)	2.5
Lebanon (1999)	2.9
Dominican Republic (1997), Philippines (1999)	3
Colombia (1999), Zambia (1997)	4.5

Top Fifteen Developing Countries with the Lowest Pharmaceutical Tariffs: Medicaments	
Côte d'Ivoire (1996), Hong Kong (1998), Libya (1996), Madagascar (1995), Malaysia (1997), Mali (1994), Mozambique (1997), Nicaragua (1999), Papua New Guinea (1997), Singapore (1995), South Africa (1999), Sri Lanka (1997), Uganda (1994)	0
Malawi (1998)	0.4
Equatorial Guinea (1998), Gabon (1995)	0.8
Honduras (1999)	1
Saint Kitts (1999)	1.1
Costa Rica (1999)	1.5
Viet Nam (1999)	1.8
El Salvador (1998)	2
Dominica (1999), Kenya (1994), Saint Lucia (1999)	2.5
Panama (1998)	2.7
Guatemala (1998)	2.8
Zambia (1997)	3.5
Barbados (1999), Guyana (1999), Jamaica (1999), Suriname (1999), Trinidad and Tobago (1999)	3.7

Indonesia (1999)	4.2
Israel (1993)	4.6

Top Fifteen Developing Countries with the Highest Pharmaceutical Tariffs: Active Ingredients	
Burkina Faso (1993)	31
Pakistan (1998)	30.9
United Republic of Tanzania (1998)	30
India (1999)	29.9
Kenya (1994)	26.8
Tunisia (1998)	22.8
Algeria (1998), Ethiopia (1995)	15
Rwanda (1993)	13.3
Peru (1999), Saudi Arabia (1999)	12
Albania (1997), Bhutan (1999), Bolivia (1999), Chile (1999), Ghana (1993), Malawi (1998)	10
Côte d'Ivoire (1996)	9.5
Thailand (1995)	9.4
Cameroon (1997), Central African Republic (1997), Chad (1997), China (1998), Mauritius (1998)	9.2
Sri Lanka (1997), Uganda (1994)	8.9
Equatorial Guinea (1998), Gabon (1995)	8.5

Top Fifteen Developing Countries with the Highest Pharmaceutical Tariffs: Medicaments	
Tunisia (1998)	20.6
Nigeria (1995)	17.1
Mauritius (1998)	16
Congo (1997)	12.5
Peru (1999)	12
Brazil (1999), Mexico (1999)	11.7
Argentina (1999)	11.5
Ethiopia (1995)	11.3
Zimbabwe (1998)	10.7
China (1998), Paraguay (1999)	10.4
Bhutan (1999), Bolivia (1999), Chile (1999), Rwanda (1993)	10
Nepal (1999)	9.9
United Republic of Tanzania (1998)	9.6
Bangladesh (1999), Morocco (1997)	9.5
Thailand (1995)	9.3

Top Fifteen African Countries with the Highest Pharmaceutical Tariffs: Active Ingredients	
Kenya (1994)	26.8
Tunisia (1998)	22.8
Algeria (1998), Ethiopia (1995)	15
Rwanda (1993)	13.3
Ghana (1993), Malawi (1998)	10
Côte d'Ivoire (1996)	9.5
Cameroon (1997), Central African Republic (1997)	9.2
Uganda (1994)	8.9
Equatorial Guinea (1998), Gabon (1995)	8.5
Nigeria (1995)	7.5
Egypt (1998)	6.9
Congo (1997), Zimbabwe (1998)	5
Zambia (1997)	4.5
Morocco (1997)	2.5
Mozambique (1997)	1.2

Top Fifteen African Countries with the Highest Pharmaceutical Tariffs: Medicaments	
Tunisia (1998)	20.6
Nigeria (1995)	17.1
Congo (1997)	12.5
Ethiopia (1995)	11.3
Zimbabwe (1998)	10.7
Rwanda (1993)	10
United Republic of Tanzania (1998)	9.6
Morocco (1997)	9.5
Ghana (1993)	9.2
Egypt (1998)	7.2
Algeria (1998), Burkina Faso (1993), Cameroon (1997), Central African Republic (1997), Chad (1997)	5
Zambia (1997)	3.5
Kenya (1994)	2.5
Equatorial Guinea (1998), Gabon (1995)	0.8
Malawi (1998), Sudan (1996)	0.4

Top Fifteen African Countries with the Lowest Pharmaceutical Tariffs: Active Ingredients	
Madagascar (1995), Sudan (1996)	0
Mali (1994)	0.3
South Africa (1999)	1
Mozambique (1997)	1.2
Morocco (1997)	2.5
Zambia (1997)	4.5
Congo (1997), Zimbabwe (1998)	5
Egypt (1998)	6.9
Nigeria (1995)	7.5
Equatorial Guinea (1998), Gabon (1995)	8.5
Uganda (1994)	8.9
Cameroon (1997), Central African Republic (1997), Mauritius (1998), Chad (1997)	9.2
Côte d'Ivoire (1996)	9.5
Ghana (1993), Malawi (1998)	10
Rwanda (1993)	13.3

Top Fifteen African Countries with the Lowest Pharmaceutical Tariffs: Medicaments	
Côte d'Ivoire (1996), Libya (1996), Madagascar (1995), Mali (1994), Mozambique (1997), South Africa (1999), Uganda (1994)	0
Malawi (1998), Sudan (1996)	0.4
Equatorial Guinea (1998), Gabon (1995)	0.8
Kenya (1994)	2.5
Uruguay (1999)	3
Zambia (1997)	3.5
Algeria (1998), Burkina Faso (1993), Cameroon (1997), Central African Republic (1997), Chad (1997)	5
Egypt (1998)	7.2
Ghana (1993)	9.2
Morocco (1997)	9.5
United Republic of Tanzania (1998)	9.6
Zimbabwe (1998)	10.7
Ethiopia (1995)	11.3
Congo (1997)	12.5
Nigeria (1995)	17.1

Top Ten Developing Country Importers	Amount of imports from industrialized countries	Amount of imports from developing countries	Amount of imports from transition economies	MFN (average) Medicaments	MFN (average) Active Ingredients
Brazil	1325 (Million dollars)	263 (Million dollars)	17 (Million dollars)	11.7 (1999)	7.4 (1999)
Mexico	955	109	8	11.7 (1999)	6.5 (1999)
Hong Kong, China	761	294	1	0 (1998)	0 (1998)
Argentina	638	139	3	11.5 (1999)	7.1 (1999)
Chinese Taipei	676	26	1	6.4 (1999)	1.5 (1999)
Singapore	522	69	1	0 (1995)	0 (1995)
Korea Republic	463	92	4	6.2 (1999)	6.7 (1999)
China	423	103	4	10.4 (1998)	9.2 (1998)
Israel	500	12	1	4.6 (1993)	0.7 (1993)
Colombia	294	202	0	6.1 (1999)	4.5 (1999)

Top Ten African Importers	Amount of imports from industrialized countries	Amount of imports from developing countries	Amount of imports from transition economies	MFN (average) Medicaments	MFN (average) Active Ingredients
Tunisia	164 (Million dollars)	8 (Million dollars)	2 (Million dollars)	20.6 (1998)	22.8 (1998)
Nigeria	79	39	0	17.1 (1995)	7.5 (1995)
Kenya	78	27	1	2.5 (1994)	26.8 (1994)
Uganda	20	34	0	0 (1994)	8.9 (1994)
Senegal	49	2	0	NA	NA
Tanzania	19	22	0	9.6 (1998)	30 (1998)
Mauritius	32	6	0	16 (1998)	9.2 (1998)
Madagascar	13	3	0	0 (1995)	0 (1995)
Togo	13	1	NA	NA	NA
Niger	11	1	0	NA	NA