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Patents and Prices

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Introduction

In mid-1999, Consumers International and Health Action International (CI/HAI) conducted a survey on the retail prices of 16 drugs in 36 countries. The objectives of the survey were to:

1.   Study the impact of pharmaceutical patents on the availability and price of essential drugs.

2.   Suggest solutions to ensure regular access to essential drugs in developing countries in a globalised economy with tighter intellectual property system.

Selection of drugs

All the 16 drugs are widely prescribed in both developing and developed countries. They were identified from the first 73 of the 500 top selling drugs [13 within the first 45] worldwide in 1997 for the following reasons:

   i.   Ciprofloxacin, nifedipine, ceftriaxone sodium, acyclovir, captopril, metformin, atenolol and zidovudine, are on the WHO list of essential drugs. The other drugs are not in the WHO list.

   ii.   Ranitidine, diclofenac sodium and diltiazem, are listed in the national essential drugs list of several developing countries.

   iii.   Simvastatin and omeprazole are the world's top two selling drugs.

   iv.   Fluconazole, lamivudine and indinavir sulphate are commonly used in the management of people living with HIV/AIDS. There is a global campaign to make drugs commonly used for HIV/AIDS more accessible.

The drugs were grouped into three categories according to their patent status:

Group one: Drugs still under patents in some countries - ceftriaxone sodium, indinavir sulphate, lamivudine, simvastatin and zidovudine.

Group two: Drugs whose patents will be expiring soon or patents have recently expired in some

countries - ciprofloxacin, fluconazole and omeprazole. In this survey, few competitors' products of these three drugs had entered the markets in the 20 countries where the patents had recently expired.

Group three: Multisource drugs, with several competitors' products available in all the countries - ranitidine, diclofenac sodium, nifedipine, acyclovir, diltiazem, captopril, metformin and atenolol.

Methodology

HAI partners and CI members were requested to select a leading retail pharmacy in the capital cities of the

respective countries, and discuss with the pharmacy the following:

• Ask for the availability and retail prices of the proprietary or brand name product of each drug listed.

• Find out the total number of products which include the originators' brand, branded generics and generics of each of the 16 drugs available in the pharmacy.

• Record the retail prices of the originators' brand and the package size

• In cases where there are several products of drug available, record the prices of the next two best selling products in addition to the proprietary brand or top-selling brand.

• Record the prices of each package size in the national currency and convert it to US dollars

Data & Analysis

Tables 1a, 1b and 1c give the retail prices in US dollars of 100 units of 29 dosage form of 16 drugs in 36 countries in July/August 1999. The countries included ten advanced industrial countries, 25 developing countries from Africa, Asia and Latin America and one from CIS (commonwealth of independent states).

Analysis of the data reveals the following:

Multinational drug firms market their proprietary brands at widely different prices in different developing countries. Table 2 gives a comparison of retail prices of nine originators' proprietary brands of eight drugs sold in developing countries. There are wide variations in retail prices between countries ranging from 1:4 to 1:59.

India has recorded the lowest prices for six out of the nine dosage forms.

Table 2 – Comparison of the lowest and highest retail prices in USD of 100 units of nine originators' proprietary brands of eight drugs in developing countries

Generic name of drug	Originator/ Proprietary name	Retail price of 100 units in USD				Ratio of lowest to highest price
		Country Lowest	Price	Country Highest	Price	
Acyclovir 200 mg	Glaxo-Welcome/Zovirax	Togo	50	Indonesia	371	1:7
Acyclovir 800 mg	Glaxo-Welcome/Zovirax	India	94	South Africa	790	1:8
Atenolol 25 mg	Zeneca/Tenormin	India	03	Cameroon	53	1:18
Ciprofloxacin 500 mg	Bayer/Ciproxin	India	15	Mozambique	740	1:49
Diclofenac 50 mg	Novartis/Voltaren	India	02	Argentina	118	1:59
Nifedipine 20 mg	Seneca/Adalat Bayer Corporation	India	03	Peru	96	1:32
Omeprazole 20 mg	Astra/Losec	Zambia	30	Brazil	477	1:11

| Ranitidine 150 mg | Glaxo-Welcome/Zantac | India | 02 | South Africa | 116 | 1:58 |
| Zidovudine 100 mg | Glaxo-Welcome/Retrovir 100 mg | Pakistan | 81 | Argentina | 316 | 1:4 |

Source: Tables 1a, 1b & 1c.

The retail prices of generic equivalents do not show the very wide variations seen in proprietary drugs, as shown in table 3. This table shows the range and ratios of the retail prices of three originators' proprietary drugs and their generic equivalents in developing countries. The range for three drugs vary from 1:7 to 1:18 for generic drugs and 1:16 to 1:59 for proprietary drugs.

Table 3: The range and ratio of the retail prices of the orginators' proprietary brands and the generic equivalents of three selected drugs in developing countries

| Generic name & strength | Range & ratios of the generic and originators' proprietary brands | | | |
| | Generic drugs | | Proprietary drugs | |
	Range of prices	Ratio of lowest to highest	Range of prices	Ratio of lowest to highest
Atenolol 100 mg	4-27	1:7	7-109	1:16
Diclofenac 50 mg	2-23	1:12	2-118	1:59
Ranitidine 150 mg	2-35	1:18	2-116	1:58

Source: Tables 1a, 1b & 1c.

The very wide variations in retail prices among developing countries are not seen in the ten OECD countries as indicated in table 4. This table compares the range of ratios between the lowest and highest prices of selected drugs under different patent status in developed and developing countries.

Table 4: Range of ratios between the lowest and highest prices of selected drugs under different patent status in developed and developing countries

| Patent Status | Range of ratios between lowest and highest retail prices of 100 units of selected drugs | | | |
| | OECD countries | | Developing countries | |
	No of dosage forms	Range of ratios	No of dosage forms	Range of ratios
Drugs protected by patents	8	1:1.7 – 1:2.2	6	1:1.2 – 1:4
Multi-source drugs	13	1:2 – 1:11.5	17	1:1.7 – 1:59

Source: Tables 1a, 1b & 1c.

The ratios for monopoly drugs range from 1:1.7–1:2.2 in OECD countries and from 1:1.2–1:4 in developing countries. However, multi-source drugs show a much wider differences in the range of retail prices both within and between OECD and developing countries. These findings indicate the following:

1.   In OECD countries, the patented drugs enjoy a monopoly and there is very little price difference among countries.

2.   Developing countries do not provide patent protection to these drugs. However being newly introduced drugs, competing national firms have not had adequate time to manufacture market and engage in price competition.

3.   The retail prices of multi-source drugs show that price competition has enabled competing firms to put into the market their drugs at lower prices. The competition is greater in some developing countries. Table 1c and 4 also show that some developing countries, particularly in Africa, have not put into their markets cheaper generic equivalents available in the world market.

The ratio of the lowest to the highest price of a multi-source drug, Zantac in developing countries is 1:58. It is US$2 per 100 units in India and Nepal while it is $116 in South Africa. (Table 5).

Table 5 – Retail prices of 100 units of Zantac (ranitidine) 150 mg in 9 developing countries

Countries	Price in USD
India	2
Nepal	2
Pakistan	21
Korea	61
Zambia	82
Bolivia	94
Senegal	100
Burkina Faso	105
South Africa	116

Source: Tables 1a, 1b & 1c.

One would expect developing countries to make available low-priced generics of multi-source drugs. But in some countries in Africa although there is no patent protection, there are monopoly markets for multi-source drugs. Table 6 gives the number of countries, among the 12 surveyed in Africa, where only the originators' proprietary brands of 11 drugs are marketed exclusively. These are all multi-source drugs and competitors' products are available in the world market.

Table 6 – Number of countries, among the 12 surveyed in Africa, where only the originators' proprietary brands of 11 multi-source drugs are exclusively marketed

Generic name of drug	Number of countries in Africawhere only the originators proprietary brand is marketed
Acyclovir	4
Atenolol	3
Captopril	3
Ciprofloxacin	1
Diclofenac	2
Diltiazam	4

Fluconazole	6
Metformin	6
Nifedipine	1
Omeprazole	3
Ranitidine	4

* Eritrea is not included. Only four of the 29 dosage forms of drugs surveyed were available in Eritrea.

Source: Tables 1a, 1b & 1c.

Of the sample of drugs surveyed, the average retail prices of some of the proprietary drugs are higher in the developing countries of Africa and Latin America compared to much more affluent OECD countries. Table 7 gives the comparison of the range of prices of 14 dosage forms of proprietary brands of 12 drugs in OECD, African, Asian and Latin American countries.

Table 7 - Comparison of the ranges in retail prices of 100 units of 14 proprietary dosage forms in OECD countries and developing countries in Africa, Asia and Latin America

Generic name of drug & strength	Range of retail prices in USD			
	OECD countries	Africa	Developing countries in Asia	Latin America
Captopril 25 mg	20-59	16-64	14-43	42-60
Captopril 50 mg	56-104	96-107	26-81	44-122
Ceftriaxone 1 g	1320-3380	1070-3403	780-2342	1619-3861
Ciprofloxacin 500 mg	169-549	197-740	15-393	344-357
Diclofenac 25 mg	12-40	8-28	6-15	35-37
Diclofenac 50 mg	20-41	19-29	2-28	30-118
Diltiezem 60 mg	14-28	31-64	8-21	57
Fluconazole 50 mg	339-599	396-660	210-405	-
Lamivudine 150 mg	290-524	340-810	115-450	400-555
Metformin 500 mg	6-22	5-50	2-12	14
Nifedipine 20 mg	19-44	39-85	3-44	96
Omeprazole 20 mg	148-296	36-300	100-185	278-477
Ranitidine 150 mg	75-122	36-116	2-61	59-94
Zidovudine 100 mg	143-278	86-270	81-119	210-316

Source: Tables 1a, 1b & 1c.

Table 8 gives the average retail prices of the 14 proprietary dosage forms in the four geographical areas.

Table 8 – Comparison of the average retail prices of 100 units of 14 proprietary dosage forms in OECD countries and developing countries in Africa, Asia and Latin America

Generic name of drug and strength	Average retail prices in USD			
	OECD countries	Africa	Developing countries in Asia	Latin America
Captopril 25 mg	39	44	34	51
Captopril 50 mg	71	102	53	70
Ceftriaxone 1 g	2210	1873	1562	2883
Ciprofloxacin 500 mg	304	398	154	351
Diclofenac 25 mg	22	18	10	36
Diclofenac 50 mg	30	25	17	71
Diltiezem 60 mg	24	41	15	57
Fluconazole 50 mg	445	460	415	-
Lamivudine 150 mg	386	464	283	497
Metformin 500 mg	11	17	7	14
Nifedipine 20 mg	31	57	18	96
Omeprazole 20 mg	234	170	158	355
Ranitidine 150 mg	94	75	30	72
Zidovudine 100 mg	209	161	105	249

The average retail prices of eight of the dosage forms are higher in African countries than in the much

more affluent countries.   The average retail prices of eleven out of 13 dosage forms are higher in Latin America than in the OECD. It should be noted that in Latin America out of the 14 dosage forms, only:

- Five dosage forms were available in four countries;

- Three dosage forms were available in two countries;

- Two dosage forms were available in three countries;

- One dosage form was available in three countries;

- One dosage form not available in any of the five.

This may explain the small variations in the ratio between the lowest and the highest prices of these dosage forms in the Latin American countries (Table 7). The ratios of the lowest to highest retail prices of the 14 dosage forms vary from:

1:1.6   –   1:3.6   in OECD countries

1:1.1   –   1:10   in African countries

1:1.5   –   1:30.6 in Asian countries

1:1   -   1:3.9   in Latin America

The small variations in the ratios between the lowest and highest prices of these dosage forms in OECD countries may be due to reasons including the following:

- Co-marketing arrangements among manufacturers;

- Parallel importing;

- Reference pricing; and

- Drug pricing policies.

Monopoly markets thrive in the absence of competition. Left to themselves without competition, the multinational drug companies will keep up the high prices wherever they can and up to as long as they can as shown in tables 2, 3, 5 and 7. Price competition is the best way to bring down monopoly prices. This is best illustrated in table 9, which compares the retail prices of originators proprietary brands in India and Indian competitors' products.

Table 9 - Comparison of retail prices of 100 units of originators' brands and competitors' products of eight dosage forms of seven drugs in India

Generic name of drug & strength	Originator	Originators' Brand names/competitors' products	Price of 100 units in US$
Acyclovir 800 mg	Wellcome	Zovirax (O)	94

Drug	Manufacturer	Brand	Price
		Ocuvir (C)	41
Atenolol 25 mg	Zeneca	Tenormin (O)	3
		Lonol (C)	2
Ciprofloxacin 500 mg	Bayer	Baycip (O)	15
		Mencip (C)	10
Diclofenac 50 mg	Novartis	Voveran (O)	2
		Diclomax (C)	2
Nifedipine 20 mg	Bayer	Adalat (O)	3
		Cardules (C)	3
Ranitidine 150 mg	Glaxo	Zinetac(O)	2
Ranitidine 300 mg	Glaxo	Histac (C)	2
		Zinetac (O)	4
		Histac (C)	3
Zidovudine 100mg	Wellcome	Retrovir (O)	119
		Zidovir (C)	42

Source: Tables 1a, 1b & 1c.

O – Originators' brand

C – Competitors' branded generic

Price competition has forced the multinationals to bring down their prices to compete with the Indian manufacturers. When faced with competition, multinationals will not leave the market. They will lower their prices and stay on to compete with the nationals. Another example comes from Bolivia where 100 units of 100mg of Retrovir (zidovudine) was priced at US$626 in 1997. Prices dropped to US$258 in 1998 when the competitor's product of zidovudine was made available and sold at US$427.   The best way to compete is to produce the drug at very low costs. It takes few years for national manufacturers to copy products by reverse engineering and enter the market as shown in table 10. This table gives an indication of the time lag between the introduction of a new drug in the world market and its introduction in India by national firms. It has taken about two to four years for an Indian firm to produce a new drug by reverse engineering.

Table 10 – Time lag between introduction of a new drug in the world market and its introduction in India by national firms

Drug	Year Introduced	
	By originators in the world market	By national firms in the Indian market
Captopril	1981	1985

Ranitidine	1983	1985
Acyclovir	1985	1988
Ciprofloxacin	1985	1989

Source: B.K. Keayla. Conquest by patents. TRIPs Agreement on Patent Laws: Impact on Pharmaceuticals & Health for All., Centre for Study of Global Trade System and Development, New Delhi, India.

It may take several years, after a drug is introduced in the market to capture a sizeable share, and reduce production costs to levels much lower than the originators. Table 11 illustrates this. It gives the retail prices of three dosage forms of three drugs still under patent protection in OECD countries and five dosage forms of 4 multi-source drugs in India[1] and the lowest retail prices of the originators' proprietary brands of these seven dosage forms in the other 35 countries surveyed.

Table 11 – The retail prices of eight dosage forms of seven drugs manufactured and marketed by Indian firms and the lowest retail prices of the same dosage forms of the originators product recorded among the 35 countries surveyed. The ratio between the Indian and the originators' price are also given.

Generic name of drug and strength	Retail price in US dollars			Ratio of Indian prices to lowest originator price
	Prices in India:	Originators' brand		
	Competitor's product	Lowest price	Country	
1) Drugs under patent protection Lamuvidine 150 mg Zidovudine 100 mg Simvastatin 20 mg	115 42 32	217 81 117	Indonesia Pakistan Cameroon	1:2 1:2 1:4
2) Multi-source drugs Fluconazole 150 mg Captopril 25 mg Omeprazole 20 mg Ranitidine 300 mg Fluconazole 100 mg	55 2 4 2 40	349 14 30 15 584	Mozambique Pakistan Zambia Zambia Malaysia	1:6 1:7 1:8 1:8 1:15

Source: Tables 1a, 1b & 1c.

Two prices are given:

(i)   Retail prices in India of the competitors' product.

(ii)   The lowest retail prices of the originators' brands of the same seven dosage forms recorded among the other 35 countries.

The three drugs still under patent protection would have been introduced into the world market later than the four multi-source drugs. The Indian firms' competing products for these three drugs would, therefore, have been in the market for shorter period compared to the four multi-source drugs.

The shorter period would not have given Indian firms adequate time to capture a sizeable market share, increase production volume, lower production costs and effectively compete in prices. The Indian firms were able to market these drugs at about two to four times cheaper than the lowest prices of the originators' proprietary drug recorded among the other 35 countries surveyed. On the other hand, the Indian prices for the multi-source drugs were about 6 to 15 times cheaper than the lowest prices of the originators' proprietary drugs recorded among the 35 countries surveyed. The Indian manufacturers had adequate time to capture considerable market share, increase production volume, lower production costs and offer low-priced drugs to consumers.

Time is, therefore, crucial in introducing generic equivalents of essential drugs soon after new drugs are put into the market, so that they can enter into price competition well before the originators secure brand loyalty for their products by skillful promotion. Many of the African countries surveyed had only the originators' proprietary brand forms of the majority of the eight multi-source drugs, while lower priced generic equivalents were available in the African market. It will be in the interest of public health to have low-priced drugs available in the market in every developing country. This is very critical since one of the criteria developing countries use for selecting drugs into their national lists of essential drugs is the price of drugs. High costs drugs, for example some of the new anti-retroviral drugs for the treatment of HIV/AIDS, are not included in the lists of essential drugs in many developing countries, because of their high prices.

Conclusions & Recommendations

The most striking feature in this survey are the following:

•   The higher prices of proprietary drugs in some of the developing countries of Africa, Asia and Latin America compared to prices in the 10 OECD countries. The retail prices of 15 out of the 18 dosage forms of eleven drugs for which comparable data are available are all higher in some of the developing countries than in the OECD countries.

•   Proprietary brand forms of several of the multi-source drugs surveyed are the only products available in many of the African countries enjoying a monopoly market, although low priced generic equivalents, are available in the world market. These countries do not offer patent protection to drugs.

•   There is a very wide variation of retail prices in the countries surveyed:

(i)   The variation in the retail prices of proprietary drugs are much wider (range: 1:16-1:59), than the variation in prices of generic equivalents (range 1:7-1:18).

(ii)   The variation in the retail prices of multi-source drugs in developing countries (range 1:1.7-1:59) are much wider than the variations in OECD countries (range 1:2-1:11.5)

It is assumed that market forces promote competition. It should therefore follow that in a free market, competition will result in lowering and more importantly, leveling of the prices. This appears to be so, in the OECD countries and to a certain extent in the generic drugs market in the developing countries

but not in the proprietary drug market in developing countries.

The smaller variation in retail drug prices in OECD may be due, as stated earlier, among others, to the following:

• Co-marketing arrangement by manufacturers;

• Parallel importing;

• Reference pricing; and

• Drug pricing policies.

The wide variation in prices of proprietary drugs in the developing countries suggests that the guiding principle which the drug industry seems to adopt in fixing prices is to set the limits according to what the market can bear. Profit maximisation seems to be the only objective.

There is evidence that competition is possible in the pharmaceutical market and this will bring prices down. Data from India proves this. When competitors introduce their products, the originators will lower their prices and compete with the national firms. They will not withdraw from the market. Thus, it is important to introduce generic competitors as early as possible to prevent the originators having time to secure brand loyalty to their products by skillful promotion.

There is a time lag between the introduction of a drug in the world market and a competitor to get its product into the home market. It takes further time to capture adequate market share so as to increase production, lower costs and compete with the originator. The Indian data on retail prices of three drugs recently introduced and four others which were introduced much earlier, illustrate this phenomenon and underscores the need for national policies on intellectual property system with provisions to enable national firms to initiate production of new drugs as early as possible. Indian firms were able to do this by a process of reverse engineering. This was possible because the Indian national legislation on patents did not provide patent protection for products.

However with TRIPs Agreement taking effect, all member states of the WTO should provide patent protection for products and processes for 20 years. The only way national firms can initiate production is by compulsory licensing which is allowed in the TRIPs Agreement. Nevertheless, only a few of the advanced developing countries can use compulsory licensing to manufacture new drugs. A vast majority of developing countries do not have any facilities for production of pharmaceuticals.

These countries depend on imports of raw materials and finished products. They can have access to lower priced drugs produced in the more advanced developing countries or by generic manufacturers in some developed countries only by parallel importing. This is also allowed in the TRIPs Agreement.

Analysis of empirical data provided in this paper supports the position that compulsory licensing and parallel imports are two provisions which should be in all national legislations on intellectual property rights. TRIPs Agreement allows these provisions to be included in the national legislation on prices. This will enable developing countries regular access to good quality essential drugs at affordable prices.

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[1] India and Nepal seem to have a 'common market' in pharmaceuticals. Drugs introduced in India are immediately available in Nepal at Indian prices.