

# **Medicine Prices, Availability and Affordability in Jordan**

*Report of a survey conducted in 2004  
in Amman, Irbid, Zarqa and Karak  
using the WHO/HAI price measurement  
methodology*

**August 2007**

# Medicine Prices, Availability and Affordability in Jordan

## Project Team

### Survey Manager

- Rania Bader, *JFDA Consultant, Jordan*

### Planning and Logistics

- **H. E. Dr. Salah Mawajdeh**, *Director General, Jordan Food and Drug Administration at the time of the study and currently Minister of Health*
- **Rania Bader**, *MSc. Pharmacy, JFDA Consultant / Jordan at the time of the study, currently WHO/HAI Project on Medicine Prices and Availability Consultant*
- Dr. Samir Otoum, *Professor, Jordan University of Science and Technology*
- Laila Jarrar, *Jordan Food and Drug Administration*

### Data Collection

- Pharmacists of the Inspection Department / Jordan Food and Drug Administration

### Data Management and Analysis

- Rania Bader, *Independent Consultant, JFDA Jordan*
- Klara Tisocki, *Independent Consultant*
- Margaret Ewen, *HAI price survey coordinator*
- Alexandra Cameron, *WHO Technical Officer, Medicines Policy and Standards*

### Presentation and Report Writing

- Rania Bader, *JFDA Consultant / Jordan at the time of the study, currently WHO/HAI Project on Medicine Prices and Availability Consultant*

## Table of Contents

<b>ABBREVIATIONS.....</b>	<b>4</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>6</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>7</b>
<b>INTRODUCTION.....</b>	<b>8</b>
HEALTH SECTOR.....	8
PHARMACEUTICAL SECTOR IN JORDAN .....	9
<b>METHODOLOGY.....</b>	<b>11</b>
SELECTION OF MEDICINE OUTLETS .....	11
SELECTION OF MEDICINES TO BE SURVEYED.....	12
DATA COLLECTION.....	12
DATA ENTRY .....	13
DATA ANALYSIS AND INTERPRETATION.....	13
<b>RESULTS .....</b>	<b>15</b>
1. AVAILABILITY OF MEDICINES IN THE PUBLIC AND PRIVATE SECTORS .....	15
2. PUBLIC SECTOR PRICES.....	16
2.1 Public sector procurement prices.....	16
2.2 Public sector patient prices .....	17
2.3 Comparison of public sector patient prices with procurement prices .....	17
3. PRIVATE SECTOR PATIENT PRICES .....	18
4. COMPARISON OF PATIENT PRICES IN THE PUBLIC AND PRIVATE SECTORS .....	20
5. AFFORDABILITY OF STANDARD TREATMENT REGIMENS.....	21
6. PRICE COMPONENTS.....	22
<i>The Jordanian Food &amp; Drug Administration (JFDA) is responsible for setting the price of medicines for sale in community pharmacies (private sector). The pricing policy used at the time of the survey is described in Annex 6.</i> .....	24
7. INTERNATIONAL COMPARISONS.....	24
<b>DISCUSSION.....</b>	<b>26</b>
<b>RECOMMENDATIONS.....</b>	<b>27</b>
<b>ANNEX 1: LIST OF CORE AND SUPPLEMENTARY MEDICINES SURVEYED.....</b>	<b>30</b>
<b>ANNEX 2. AVAILABILITY OF INDIVIDUAL MEDICINES, PUBLIC AND PRIVATE SECTOR .....</b>	<b>31</b>
<b>ANNEX 3. INDIVIDUAL MEDIAN PRICE RATIOS, PUBLIC SECTOR PROCUREMENT PRICES...32</b>	<b>32</b>
<b>NOTE: THE HIGH REFERENCE PRICE FOR LOSARTAN INFLUENCED THE LOW MPR FOR THIS MEDICINE.....</b>	<b>32</b>
<b>ANNEX 4. INDIVIDUAL MEDIAN PRICE RATIOS, PUBLIC SECTOR PATIENT PRICES.....</b>	<b>33</b>
<b>ANNEX 5. MEDIAN PRICE RATIOS, PRIVATE SECTOR PATIENT PRICES.....</b>	<b>34</b>
<b>ANNEX 6. PHARMACEUTICAL PRICING POLICIES IN JORDAN .....</b>	<b>35</b>
<i>Determining the price of newly registered medicines (Originator Brand) this is the pricing policy that was adapted at the time of the survey in 2004.....</i>	<i>35</i>

## Medicine Prices, Availability and Affordability in Jordan

### Abbreviations

Cap	Capsule
CIF	Cost, insurance and freight
CMS	Central medical store
FOB	Free on board
GDP	Gross domestic product
GST	Goods and services tax
HAI	Health Action International
INN	International non-proprietary name
Inh	Inhaler
Inj	Injection
IQR	Interquartile range
JD	Jordanian Dinars
JFDA	Jordan Food and Drug Administration
JUH	Jordan University Hospital
LPG	Lowest priced generic equivalent
MoH	Ministry of Health
MPR	Median price ratio
MSH	Management Sciences for Health
NEDL	National Essential Drug List
OB	Originator Brand
RMS	Royal Medical Services
Susp	Suspension
Tab	Tablet
USD	United States dollars (also \$)
VAT	Value added tax
WHO	World Health Organization

## Medicine Prices, Availability and Affordability in Jordan

### List of Figures

- Figure 1. Public and private sector facilities sampled
- Figure 2. Individual availability of lowest priced generics in public health facilities
- Figure 3. Percentage difference between patient prices and procurement prices for lowest priced generics in the public sector
- Figure 4. Median price ratios for selected medicines with MPR>10, originator brand and generic equivalents.
- Figure 5. Number of times greater private sector prices compared to public sector lowest price generics prices
- Figure 6. Comparison of affordability of treatments in the public and private sector (days wages/treatment regimen)
- Figure 7. Contribution of price components to the final retail price, Amoxil (amoxicillin) 250 mg, 20 tab, imported originator brand

### List of Tables

- Table 1. Insurance coverage in Jordan
- Table 2. Median percentage availability in the public and private sector
- Table 3. Public sector procurement prices – ratio of median local price to international reference price (median price ratio or MPR), median for medicines purchased
- Table 4. Public sector patient prices - ratio of median local price to international reference price (median price ratio or MPR), median for medicines found in 4 or more facilities
- Table 5. Median MPRs for medicines found in both public sectors (procurement and patient prices)
- Table 6. Private sector patient prices - ratio of median local price to international reference price (median price ratio or MPR), median for medicines found in 4 or more private pharmacies
- Table 7. Comparison of patient prices for originator brands and lowest priced generics in private pharmacies: Median MPRs for medicines found as both product types
- Table 8. Median MPRs for medicines found in both the public and private sectors
- Table 9. Number of days wages of the lowest paid unskilled government worker needed to purchase standard treatment
- Table 10. Affordability of treatment for a family with peptic ulcer and diabetes
- Table 11. Example of price components of an imported originator brand product sold in private retail pharmacies
- Table 12. MPRs for originator brands and lowest priced generics, public procurement prices, 6 countries in the Eastern Mediterranean region (adjusted to MSH2003)
- Table 13. MPRs for originator brands and lowest priced generics, private sector, in 6 countries in the Eastern Mediterranean region (adjusted to MSH2003)

## Medicine Prices, Availability and Affordability in Jordan

### Acknowledgements

We are grateful to the Jordan Food and Drug Administration and the Ministry of Health for their permission to conduct the study, and the Inspection Department's employees at the JFDA in Amman, Zarqa, Irbid and Karak who endorsed the survey. We would also like to thank particularly Ph. Lubna Qoussous, Ph. Hiam Al Dabbas and Ph. Rana Abu Failat who gave up their valuable time and support as well as their assistance through the time of writing this report.

We are thankful for the cooperation and participation of the pharmacists and other staff at the medicine outlets where data collection took place.

Health Action International and the World Health Organization provided technical support for the survey and their assistance is gratefully acknowledged. I would also like to thank the following individuals whose assistance was invaluable to the study:

- Margaret Ewen, *HAI pricing project coordinator*
- Dr. Richard Laing, *Medical Officer, Medicines Policy and Standards, WHO Geneva*
- Dr. Zafar Mirza, *Regional Pharmaceutical Adviser, WHO EMRO*
- Klara Tisocki, *Independent Consultant*
- Alexandra Cameron, *Technical Officer, Medicines Policy and Standards, WHO Geneva*

This medicine price survey was conducted without external funding.

### Conflict of Interest Statement

None of the project team or anyone who had influence on the conduct, analysis, or interpretation of the results has any competing financial or other interests.

### Executive summary

#### Background:

A field study to measure the price, availability and affordability of selected medicines was undertaken in Jordan in May 2004 using a standardized methodology developed by the World Health Organization (WHO) and Health Action International (HAI).

#### Method:

The survey was conducted in four areas: Amman (Middle Region), Zarqa (Middle Region), Irbid (North Region), and Karak (South Region). Data on the patient price and availability of 38 medicines was collected in 18 public sector outlets and 20 private retail pharmacies, selected using a validated sampling frame. Data was also collected on public sector procurement prices. For each medicine, data was collected for the originator brand and lowest priced generic equivalent (generic product with the lowest price at each facility). Prices are expressed as ratios to international reference prices (Management Sciences for Health *International Drug Price Indicator Guide* 2003). Using the salary of the lowest-paid unskilled government worker, affordability was calculated as the number of days' wages this worker would need to purchase standard treatments for common conditions. Availability was determined on the day of data collection.

#### Results:

In the public sector, the procurement agency is purchasing medicines at prices comparable to international reference prices, indicating a high level of purchasing efficiency. However, some high priced originator brands are being purchased. Public sector patient prices for generic medicines are similar to procurement prices, indicating very low or no mark-ups in the public sector distribution chain. However, median availability of generic medicines in the public sector was only 28%, indicating that many patients must purchase medicines through the private sector. In the private sector, the median availability of originator brand and generic medicines was 60% and 80%, respectively. Generic medicines in private pharmacies were priced about 10 times higher than in the public sector, and 10 times higher than international reference prices. When originator brand medicines are dispensed in private pharmacies, patients pay about twice the price of generics.

To treat common conditions using standard regimens, the lowest paid government worker would need between 2.1 days to treat arthritis with diclofenac and 4.6 days to treat an ulcer treated with ranitidine when purchasing lowest priced generics from private pharmacies. If originator brands are dispensed, costs escalate to between 4.6 and 8.6 days wages respectively. Some treatments were clearly unaffordable specially for chronic conditions e.g. ulcer treatment with originator brand omeprazole costs 19.9 days' wages. Affordability is much better for medicines purchased in the public sector but availability is poor.

#### Recommendations:

The results of the survey show that the affordability, availability, and prices of medicines in Jordan should be improved in order to ensure equity in access to medicines, especially for the poor. This requires multi-faceted interventions, including the review of policies and regulations, and the implementation of educational interventions to improve the use of generics. There is an urgent need to improve the availability of low priced quality generics in the public sector through improved financing and distribution mechanisms. The current review of pricing policy can also lead substantial reduction of prices in the private sector.

### Introduction

In 2004 a nationwide study of the price, availability and affordability of a selection of medicines was conducted in Jordan. The main goal of the study was to document and compare patient prices in the public and private sector, and to compare these prices with those in other countries.

This study was based on a standardized methodology developed by the World Health Organization (WHO) and Health Action International (HAI). The WHO /HAI methodology is described in the manual "Medicine Prices: A new approach to measurement" (WHO/HAI, 2003) and is accessible on HAI's website.<sup>1</sup>

The main objectives of the study were to answer the following questions:

- Is the public sector purchasing medicines efficiently?
- What is the availability of originator brands and generics in the public and private sectors?
- What is the patient price of originator brands and lowest priced generics in the public and private sectors, and how do these prices compare with international reference prices?
- What is the difference in price between originator brands and lowest priced generic equivalents?
- How affordable are treatments, for common conditions, for people on low incomes?
- How do prices of medicines in Jordan compare to those in other countries?

### *Jordan Background*

Jordan is situated in the Middle East and bordered to the north and north-east by Syria and Iraq, to the south by Saudi Arabia and the Gulf of Aqaba, and to the west by the occupied West Bank. Jordan is small in size, covering an area of about 91,880 square kilometers. The total population is 5.906 million (2006); with a 2.3% growth rate. The majority (82.3%) of the population lives in urban areas. Life expectancy at birth is 72 years, with 3.3 % of the population over the age of 65 years. Jordan is classified as a .lower-middle income country with a GDP of US 1,877 (2003) per capita

### *Health sector*

The Jordan National Health Accounts Study (2000) reported that in 1998 the total health expenditure/capita was 177 US \$ or 9.4 % of GDP. The total expenditure on medicines in 1998 was JD159 million and comprised one-third of total public and private health expenditure of JD 454 million which is a relatively high percentage. According to MoH data, government expenditure on medicines as a proportion of total medicine expenditure in Jordan is relatively small, and has ranged from 19% in 1996 to 17% in 2003. Over 80% of the cost of medicines purchased in Jordan by the public is funded through out-of-pocket payments

The public health sector is composed of tertiary hospitals, primary health care centres, and rural health posts. There are 86 hospitals and 1615 pharmacies in the public and private health sectors.

In 1998, 32% of the population was uninsured. There are a number of different insurance arrangements:

---

<sup>1</sup> <http://www.haiweb.org/medicineprices>

## Medicine Prices, Availability and Affordability in Jordan

**Table 1. Insurance coverage in Jordan**

<b>System</b>	<b>Coverage</b>	<b>% of Population</b>
Government MoH	Civil servants and their dependants, individuals certified as poor, disabled and blood donors	21%
Royal Medical Services	Military personnel and their dependants, other referrals from MoH and JUH, and contractual agreements with public firms	33%
Jordan University Hospital	Employees and dependants	1%
Refugees' Mission	United Nations Relief Works Agency (provides care for 400,000 Palestinian refugees) plus others	18%
Private Insurance	Employees of some companies, and others willing to pay for insurance	8%

Note: the above table appears to indicate that 81% of the population is insured, whereas only 68% is actually insured – this difference is due to the fact that some people have multiple insurance coverage.

### ***Pharmaceutical sector in Jordan***

In 2003, the expenditure on pharmaceuticals in Jordan was JD 211 million (about US\$ 295 million). Over the last 5 years, the average growth rate has been about 3%, after allowing for population increases. This is due to increasing in medicine costs and consumption rates. The rate of growth is considerably lower than that of most developed countries.

The Jordanian pharmaceutical market is made up of imported products (75%) and locally manufactured products (25%). Most of the locally-produced medicines are generics, usually sold under a commercial name (branded generics). About 5% of the local production is produced under license through an agreement with the originator brand manufacturer and there is some local labeling and packaging undertaken using products supplied in bulk from the originator company.

Pharmaceuticals are supplied through both the public and private health care systems. Public sector pharmacies are attached to health centres or public hospitals. The private sector is composed of independent community pharmacies and chain pharmacies as well as hospital pharmacies located in private health facilities.

Several different brands of a medicine can be listed by private health insurers for reimbursement. Private health insurance funds generally require doctors to prescribe lowest price generics in a given bio-equivalent category. However, the present drug law does not allow for generic substitution or other changes to the prescription unless the prescribing doctor has formally agreed in writing. This applies where the patient is insured (68% of population).

The Jordanian pharmaceutical industry (comprising 18 companies) is dynamic, profitable and export-oriented, with exports markets in over 60 countries, including the Middle East, South Africa, Europe and North America (export is limited with Egypt and Syria as these countries have protection arrangements for the local industry, though it is understood that the situation in Syria is currently undergoing change). In 2003 production for the local industry totaled JD141.6 million, of which JD103 million (73%) was exported. The remaining JD38.6 million was for local consumption, and of this JD9.9 million (25.6%) was spent on government

## Medicine Prices, Availability and Affordability in Jordan

tenders. The industry represents a capital investment in excess of US\$400 million, and has generated over 4,000 jobs.

A national medicines policy has been in place since 2002<sup>2</sup> and the 2<sup>nd</sup> edition of the Jordan National Drug Formulary was published<sup>3</sup> in the same year. The Jordan National Drug Formulary (JNDF) was reviewed and published in August 2006.<sup>4</sup>

For the public system, medicines are acquired through tenders issued by the generic (or scientific) name of the medicines. These tenders are conducted through one of three sources: the Ministry of Health (MoH), the Royal Medical Services (RMS) and the Jordan University Hospital (JUH). In 2006 the Joint Procurement Administration was established in Jordan. Their first tender, in August 2007, will be for antibiotics for the MoH and RMS.

The sale of medicines is regulated by the Pharmacy and Drug Law as enforced by the Jordan Food and Drug Administration (JFDA). Prices in Jordan are regulated, and registration of a product does include setting of prices. Registration fees differ between originator brands and generics, and between imported and locally produced medicines. Generics and locally produced have lower registration fees.

---

<sup>2</sup> Hashemite Kingdom of Jordan. 2002, National Drug Policy. National Drug Policy Management & Implementation Department, Drug Directorate, Ministry of Health, Jordan.

<sup>3</sup> Hashemite Kingdom of Jordan. 2002, Jordan National Drug Formulary for Essential Drugs, 2<sup>nd</sup> Ed.. Drug Directorate, Ministry of Health, Jordan.

<sup>4</sup> <http://www.jfda.jo/RDI.2/Home%20Page/Home%20Page.htm>

### Methodology

The survey of the price, availability, and affordability of medicines in Jordan was conducted using the standardized WHO/HAI methodology (WHO/HAI 2003). Prices and/or availability data was collected for:

1. Public sector procurement prices
2. Public sector patient prices
3. Private sector patient prices

A total of 29 medicines were surveyed: 23 from the WHO/HAI core list and an additional 6 medicines of local importance. For each medicine, up to two products were surveyed, namely:

- Originator brand (OB) - the original patented pharmaceutical product
- Lowest price generic equivalent (LPG) - the lowest priced generic medicine available in the facility at the time of survey

Data was also collected for the most sold generic but it will not be included in the analysis.

Public sector procurement prices were obtained centrally from the procurement center of the Ministry of Health. Both public and private sector pharmacies were surveyed for both the availability and final (patient) price of the medicine.

To identify the various components that contribute to the final price of medicines, the WHO/HAI methodology recommends tracing the prices of a selection of medicines back from the patient price to manufacturer's selling price, in order to identify actual mark-ups, fees and other charges in the supply chain. Seven medicines were back calculated from retail prices based on the country's regulated retail and wholesale margins and other charges, however, these charges were not verified by inspecting invoices and other documents showing actual procurement prices.

### ***Selection of medicine outlets***

Sampling was conducted in a manner consistent with the WHO/HAI methodology, which has been shown through a recent validation study to yield a nationally representative sample<sup>5</sup>.

Data was collected in four areas of the country: two from the **Middle Region** which constitutes 51.2% of the total area of Jordan, and one from each of the **North Region** and **South Region** representing 32.6% and 16.2% of the country respectively. The major urban centre (Amman) was selected as one survey area, with an additional three areas chosen at random from those which can be reached within a one day's drive from the major urban centre. In Jordan, this resulted in the following four survey areas:

1. Middle Region: Amman and Zarqa
2. North Region: Irbid
3. South Region: Karak

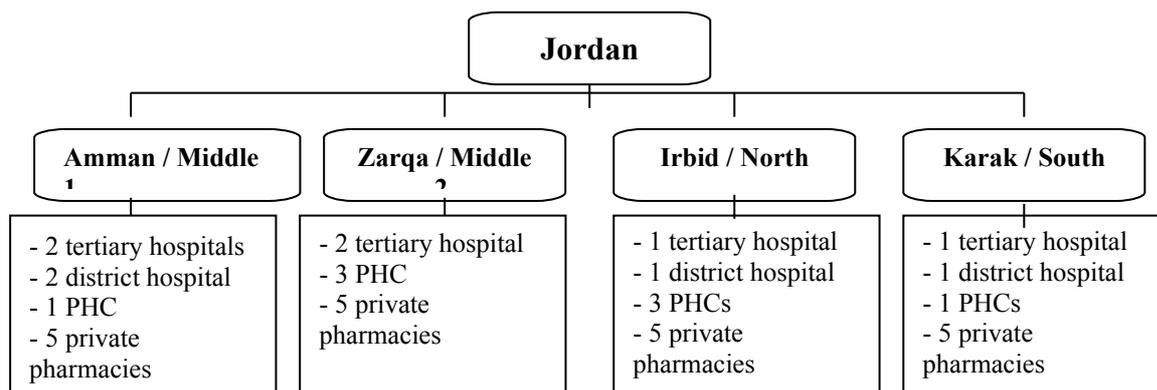
---

<sup>5</sup> The WHO/HAI sampling methodology was recently validated in a medicine prices survey conducted in Peru. In this survey, a much larger selection of public and private medicine outlets, from a greater number of geographical regions, were included than is required in the standard sample. Results from the expanded sample were consistent with those from the standard sample, showing that the standard sampling frame is nationally representative.

## Medicine Prices, Availability and Affordability in Jordan

The sample of public sector medicine outlets was then identified. In each survey area, the main public hospital was selected. An additional four public sector medicine outlets (e.g. hospital pharmacies, health centre dispensaries) were selected at random from those within a 4 hour's drive from the main hospital. This selection was made from all public facilities expected to stock most of the medicines in the survey. Finally, the private pharmacy closest to each of the selected public medicine outlets was then selected to form the private sector sample of 20 pharmacies.

**Figure 1. Public and private sector facilities sampled**



### ***Selection of medicines to be surveyed***

The WHO/HAI methodology specifies a core list of 30 medicines to be surveyed, representing medicines commonly used in the treatment of a range of chronic and acute conditions. The methodology also includes the specific dosage form and strength that is to be collected for each medicine, and recommended pack sizes. This ensures that data on comparable medicines are collected in all surveys, thereby allowing international comparisons to be made.

In Jordan 23 medicines from the WHO/HAI core list were included in the survey. Seven medicines from the WHO/HAI list were excluded as they were either not available in the country or not used. The methodology also allows up to 20 supplementary medicines of local importance to be included in the survey. Six supplementary medicines were chosen resulting in a total of 29 survey medicines (Annex 1).

### ***Data Collection***

The survey team consisted of a survey manager, four survey area supervisors, and eight data collectors who were pharmacists from the Inspection Department at the JFDA. All personnel involved in data collection received training in the survey methodology and data collection protocols at a workshop held on May 7<sup>th</sup> and 8<sup>th</sup> 2004. As part of the workshop, a pilot data collection test was conducted at 2 public and 2 private medicine outlets which did not form part of the survey sample.

Data collection took place between the 9<sup>th</sup> the 14<sup>th</sup> of May 2004. Data collectors visited medicine outlets in pairs and collected information on medicine availability and price using a data collection form specific to the medicines being surveyed in Jordan. Area supervisors checked all forms at the end of each day of data collection, and validated the data collection process by collecting information at 10% of the medicine outlets themselves and comparing their results with those of the data collectors. Upon completion of the survey the survey

## Medicine Prices, Availability and Affordability in Jordan

manager conducted a quality control check of all data collection forms, and data was checked by HAI.

Public procurement data was collected on the prices that the government pays to procure medicines. Data was collected for the same core and supplementary medicines as surveyed in medicine outlets. Procurement data was obtained from Ministry of Health procurement department officials.

### **Data Entry**

Price data was entered into the pre-programmed MS Excel workbook provided as part of the WHO/HAI methodology. Data entry was checked using the 'double entry' and 'data checker' functions of the workbook. Erroneous entries and potential outliers were verified and corrected as necessary.

### **Data Analysis and Interpretation**

**Availability** is calculated as the percentage (%) of establishments where an individual medicine was found. It should be kept in mind that the availability data only refers to the day of data collection at each particular facility and may not reflect average monthly or yearly availability of medicines at individual facilities.

For the price analysis, medicines needed to be found in at least 4 pharmacies for their price data to be included, except for procurement prices where a single data point was accepted.

Medicine prices found during the survey are not expressed as currency units, but rather as ratios relative to a standard set of international reference prices:

$$\text{Medicine Price Ratio (MPR)} = \frac{\text{Median local unit price}}{\text{Median international reference unit price}}$$

The ratio is thus an expression of how much greater or less the local medicine price is than the international reference price e.g. an MPR of 2 would mean that the local medicine price is twice that of the international reference price. Median price ratios facilitate cross-country comparisons of medicine price data.

The reference prices were sourced from the Management Sciences for Health (MSH) *International Drug Price Indicator Guide* (2003 prices). These reference prices are the medians of recent prices offered by for-profit and not-for-profit international suppliers of generic products to developing countries. These suppliers typically sell to governments or large NGOs in bulk, and therefore prices are relatively low and represent efficient bulk procurement without the costs of shipping or insurance.

All reference prices were converted to Jordanian Dinar's using the exchange rate (buying rate) on May 15<sup>th</sup> 2004, the first day of data collection, i.e. 1 USD = 0.71 JD.

Results are presented for individual medicines, as well as for the overall 'basket' of medicines surveyed as a median. Summary results for the basket of medicines have been shown to provide a reasonable representation of medicine prices in the country and price conditions on the market.

As averages can be skewed by outlying values, median values have been used in the analysis as a better representation of the midpoint value. The magnitude of price and

## **Medicine Prices, Availability and Affordability in Jordan**

availability variations is presented as the interquartile range. A quartile is a percentile rank that divides a distribution into 4 equal parts. The range of values containing the central half of the observations, that is, the range between the 25<sup>th</sup> and 75<sup>th</sup> percentiles, is the interquartile range.

Finally, the affordability of treating several common conditions was assessed by comparing the total price of medicine treatment, using standard dosing regimens, to the daily wage of the lowest paid unskilled government worker (JD 3/day = US \$ 4.22/day at the time of the survey). Though it is difficult to assess true affordability, treatments costing one days wage or less (for a week's course of treatment for an acute condition or a 30-day supply of medicine for chronic diseases) are generally considered affordable.

## **Results**

### **1. Availability of medicines in the public and private sectors**

Twenty-five of the 29 surveyed medicines were found at public sector dispensaries visited during the survey. However, the median availability for generics was 27.8% and 0% for originator brands.

Only two medicines had availability in excess of 80% - co-trimoxazole suspension 83% and methyldopa 89%. Four other medicines - amoxicillin, ciprofloxacin, furosemide and glibenclamide - were present in at least 70% of the facilities. Thirteen medicines were available in less than 30% of facilities (including salbutamol, atenolol, aciclovir and amitriptyline) and a further four were not available at any of the public sector facilities (diclofenac, fluphenazine, metformin and losartan).

The median availability of surveyed medicines was higher for generics, 80%, than for originator brand products, 60% in private retail pharmacies. Phenytoin tablets and fluphenazine injection were present as originator brands only, while amitriptyline was found as generic only, in the private pharmacies visited. All the other surveyed medicines were found both as originator brands and generic equivalents in the private pharmacies. Less than 60% generic availability was noted for only three medicines in the private sector beclometasone inhaler (35%), hydrochlorothiazide tablets (40%) and diltiazem (55%).

Overall hydrochlorothiazide had relatively low availability in both public and private facilities surveyed, i.e. it was available in only 5.6% of public facilities (generic) and 5% and 40% of private pharmacies as originator brand and generic respectively. Fluphenazine was only found in 15% of private retail pharmacies and only as the originator brand product.

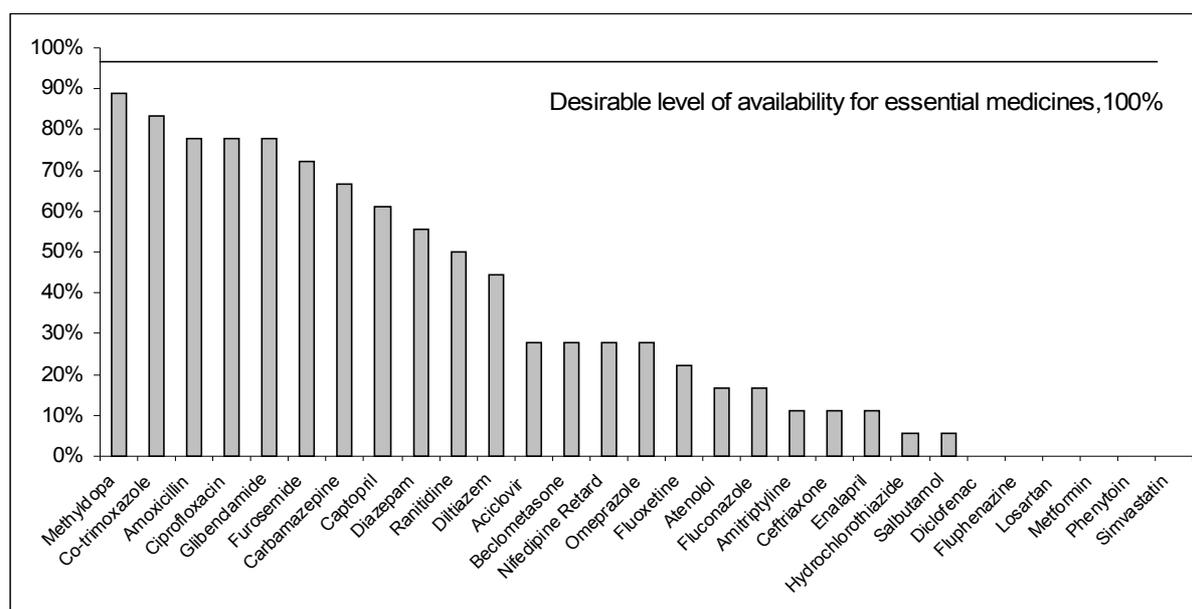
**Table 2. Median percentage availability in the public and private sector**

	<b>Public sector (n =18 outlets)</b>		<b>Private sector (n = 20 outlets)</b>	
	<b>Originator Brands</b>	<b>Lowest price generics</b>	<b>Originator Brands</b>	<b>Lowest price generics</b>
<b>Median availability</b>	0.0%	27.8%	60.0%	80.0%
<b>25 %ile availability</b>	0.0%	5.6%	55.0%	60.0%
<b>75 %ile availability</b>	0.0%	61.1%	75.0%	90.0%

Annex 2 lists the availability of individual medicines in both the public and private sectors and Figure 2 shows the percentage availability of each generic in the public sector facilities sampled.

## Medicine Prices, Availability and Affordability in Jordan

Figure 2. Individual availability of lowest priced generics in public health facilities



## 2. Public sector prices

### 2.1 Public sector procurement prices

Public procurement prices were available for 28 medicines out of the 29 medicines surveyed, where 13 medicines were procured as originator brands and 15 as lowest priced generics. Overall, as shown in Table 3, lowest priced generics were purchased at about half the reference price (median MPR 0.57) and originator brands were procured at 38% more than the reference price (median MPR 1.38). These prices represent efficient and cost-effective procurement. However, for a number of medicines only originator brands were procured. Procuring only low priced generics offers opportunities for cost-savings. For example, in the case of amitriptyline MPR 3.42 and diazepam MPR 2.46 the comparison to the international reference price shows that low cost good quality generics can be procured at significantly lower prices than the originator brand products. There are several generic amitriptyline and diazepam products registered in Jordan, so the procurement of the originator brand is not justified when lower cost generics offer better use of public funds. Phenytoin was high priced (MPR 6.53), and only the originator brand was purchased as no generic equivalents are registered in Jordan.

Table 3. Public sector procurement prices – ratio of median local price to international reference price (median price ratio or MPR), median for medicines purchased

Type and number of medicines	Median MPR	25 %ile	75 %ile
Originator brands (n = 13)	1.38	0.72	2.25
Lowest price generics (n = 15)	0.57	0.31	0.71

Annex 3 lists procurement median price ratios for individual medicines.

## 2.2 Public sector patient prices

As shown in Table 4, lowest priced generics are generally sold to patients in public sector facilities at 10% less than the international reference price (median MPR 0.9). In these facilities, only one originator brand (phenytoin) was found in 4 or more facilities to calculate the MPR (5.95) which was lower than the procurement price (MPR 6.53).

**Table 4. Public sector patient prices - ratio of median local price to international reference price (median price ratio or MPR), median for medicines found in 4 or more facilities**

Type and number of medicines	Median MPR	25 %ile	75 %ile
Originator brand (n = 1)	5.95	-	-
Lowest price generics (n = 16)	0.85	0.57	1.18

Annex 4 lists patient prices (as median price ratios) for individual medicines found in the public sector.

Three generics were priced at more than 50% of their reference price – diazepam (MPR 2.41), furosemide (MPR 2.64) and fluoxetine (MPR 1.72). Conversely, patient prices of three generics were about a third of their reference price - captopril (MPR 0.29), nifedipine retard (MPR 0.33), and omeprazole (MPR 0.24). The 25<sup>th</sup> and 75<sup>th</sup> percentiles show that, in general, prices of generics have little variability across public sector facilities.

## 2.3 Comparison of public sector patient prices with procurement prices

In the analysis shown in Table 5 below, only medicines found in four or more public sector facilities and that had public procurement price data were included. Results show that for lowest priced generics, patient prices in the public sector were slightly less than procurement prices.

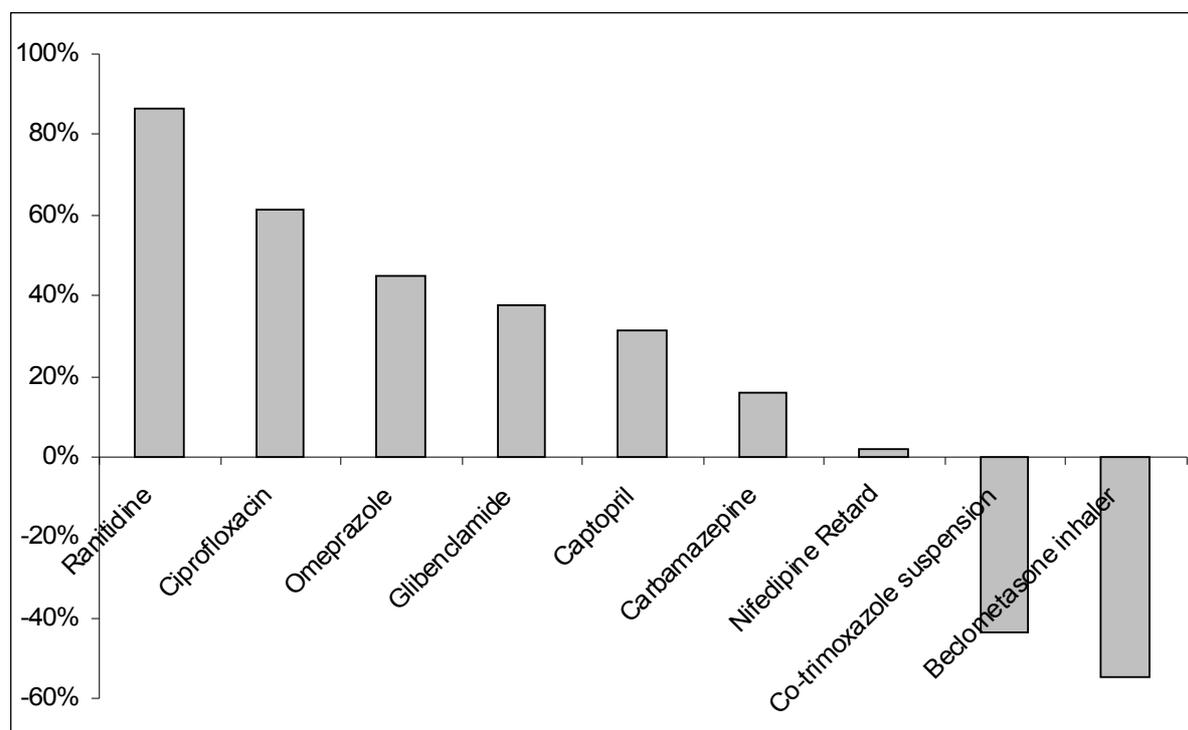
**Table 5. Median MPRs for medicines found in both public sectors (procurement and patient prices)**

Type and number of medicines	Median MPR Public Sector Procurement Prices	Median MPR Public Sector Patient Prices	% difference public patient prices to procurement prices
Originator brand (n = 1)	6.53	5.95	-8.8%
Lowest price generics (n = 9)	0.66	0.63	-4.5%

For seven generics, patient prices varied between 2% - 86% more than the procurement price, but in two cases (beclometasone inhaler, co-trimoxazole suspension) the patient price was 55% and 43% lower than the procurement price (see Figure 3). This probably indicates that there is no set percentage mark-up or subsidy applied when setting patient prices in the public sector but rather these are set on an individual basis.

## Medicine Prices, Availability and Affordability in Jordan

**Figure 3. Percentage difference between patient prices and procurement prices for lowest priced generics in the public sector**



### 3. Private sector patient prices

As shown in Table 6, patient prices for originator brand products were about 17 times higher than the international reference prices, with half of the medicines priced between 11 and 51 times more than the reference prices. Lowest priced generics were 10.5 times more than reference prices, with half of the medicines between 6 and 18 times more than reference prices. The highest priced medicine was enalapril; MPR 160 and 69 for the originator brand and lowest priced generics respectively. This is surprising as enalapril is off-patent and usually available at much lower prices in many countries. Fluconazole had the highest generic price (MPR 70). The results show that overall prices in private retail pharmacies are high in Jordan for both originator brands and lowest priced generics. The percentiles data shows that prices vary more for originator brands than lowest priced generics in private pharmacies.

**Table 6. Private sector patient prices - ratio of median local price to international reference price (median price ratio or MPR), median for medicines found in 4 or more private pharmacies**

Type and number of medicines	Median MPR	25 %ile	75 %ile
Originator brand (n = 25)	17.05	10.69	50.70
Lowest price generic (n = 27)	10.50	5.67	18.42

Annex 5 lists median price ratios for individual medicines found in the private sector.

## Medicine Prices, Availability and Affordability in Jordan

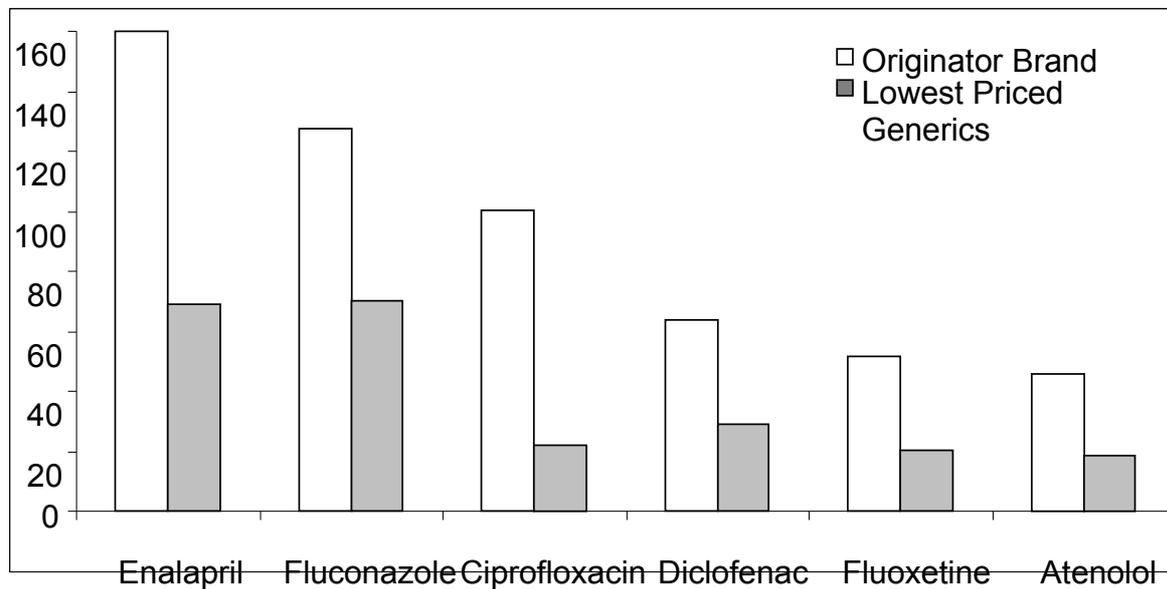
**Table 7. Comparison of patient prices for originator brands and lowest priced generics in private pharmacies: Median MPRs for medicines found as both product types**

Type (n = 24 medicines)	Median MPR	25 %ile	75 %ile
Originator brand	18.77	11.43	50.93
Lowest price generic	9.37	5.33	18.40

In the above table the median MPR is shown for those medicines found as both types (originator brand and lowest priced generic). In general, originator brands cost twice as much as lowest priced generic equivalents. Thus patients are paying substantially more to purchase originator brand products when lower priced generics are available.

Most of the originator brand products (76%) had a MPR over 10, while 52% of generics also had an MPR over 10 (see examples in Figure 4 below).

**Figure 4. Median price ratios for selected medicines with MPR>10, originator brand and generic equivalents.**



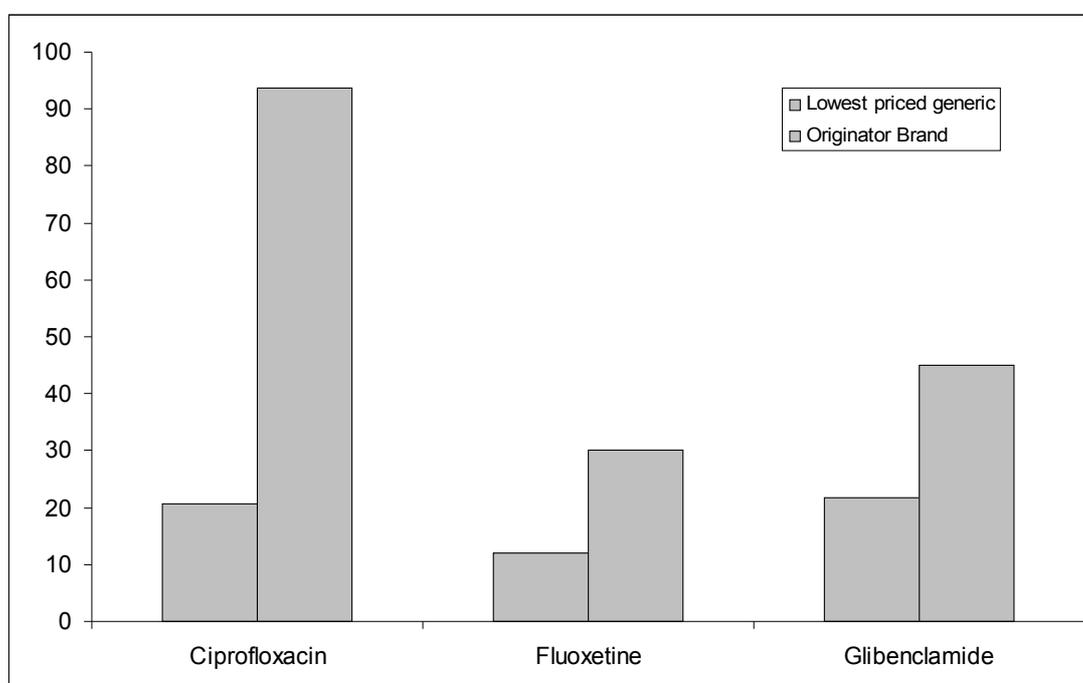
#### **4. Comparison of patient prices in the public and private sectors**

**Table 8. Median MPRs for medicines found in both the public and private sectors**

<b>Type and number of medicines in both sectors</b>	<b>Median MPR Public sector patient prices</b>	<b>Median MPR Private sector patient prices</b>	<b>% Difference private to public</b>
Originator brand (n = 1)	5.95	9.30	+56%
Lowest price generics (n = 16)	0.85	9.49	+1016%

In Table 8 above, only those medicines found in both public and private sector facilities were included in the analysis to compare prices between the two sectors. Results show that patient prices in the private sector for lowest priced generics were over 10 times higher than in the public sector. This is concerning given the poor availability of medicines in the public sector, thereby patients have to buy many medicines at considerably higher prices in the private sector. Figure 5 illustrates, using three examples, how much more patients have to pay for originator brands and lowest priced generics in the private sector compared to the price of lowest priced generics in the public sector. While the availability of generic ciprofloxacin and glibenclamide was 78% in the public sector, the availability of fluoxetine was poor (22% generics, 0% originator brand). Patients buying the lowest priced generic fluoxetine in the private sector pay 12 times more than what they would pay if the medicine was available in the public sector.

**Figure 5. Number of times greater private sector prices compared to public sector lowest price generics prices**



### **5. Affordability of standard treatment regimens**

Affordability was assessed as the number of days wages the lowest paid unskilled government worker needed to purchase medicines for 8 common conditions using standard regimens. For chronic diseases, the affordability of a 30-day supply of medicines was determined; for acute conditions it was either a course of treatment or 7 days

**Table 9. Number of day's wages of the lowest paid unskilled government worker needed to purchase standard treatments**

Condition, medicine and standard regimen used			Day's wages to pay for treatment		
Condition	Drug name	Dosage and duration	LPG public sector	LPG private sector	OB private sector
Arthritis	Diclofenac	25mg twice daily x 30 days	n/a	2.1	4.6
Asthma	Salbutamol inhaler	1 inhaler (200 doses)	n/a	0.5	1.2
Depression	Amitriptyline	25mg three times daily x 30 days	n/a	1.4	n/a
Depression	Fluoxetine	20mg twice daily x 30 days	0.7	8.6	21.6
Diabetes	Glibenclamide	5mg twice daily x 30 days	<0.1	1.1	2.2
Gonorrhoea	Ciprofloxacin	500mg single dose	<0.1	0.2	0.8
Hypertension	Atenolol	50mg daily x 30 days	n/a	1.2	3.0
Respiratory infect. (adult)	Amoxicillin	250mg three times daily x 7 days	0.1	0.9	2.3
Respiratory infect. (child)	Co-trimoxazole suspension	5mL twice daily x 7 days	0.1	0.3	0.9
Ulcer (peptic)	Ranitidine	150mg twice daily x 30 days	0.2	4.6	8.6
Ulcer (duodenal)	Omeprazole	20mg daily x 30 days	0.3	7.7	19.9

Note: n/a indicates insufficient price data to assess affordability

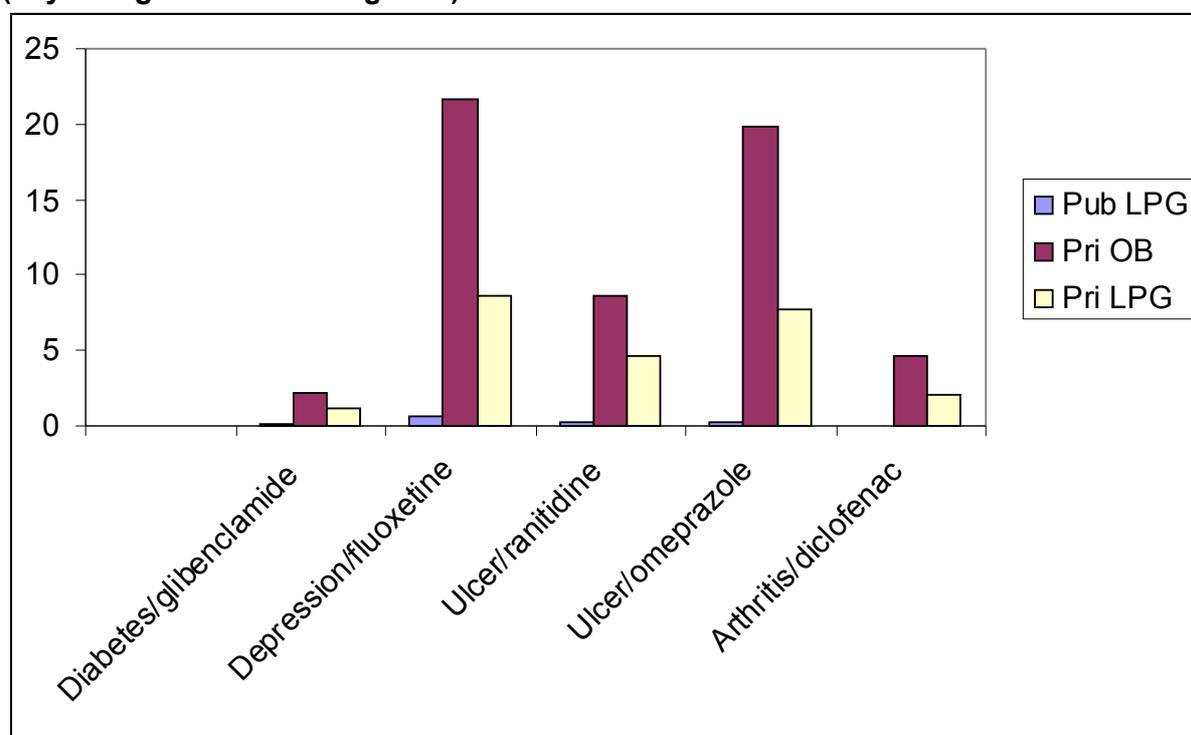
Affordability in the public sector was generally acceptable for the lowest paid government worker for all conditions, with standard treatments costing a days' wage or less. However, poor availability means that many patients are forced to purchase medicines from the private sector.

In the private sector, the most affordable treatments were those for treating acute conditions such as acute respiratory infection for children and adults costing one days wage or less. Purchasing most chronic treatments cost more than one days wage – they ranged from 1.1 to 21.6 days wages. This is a heavy financial burden for poor people. For example, originator brand fluoxetine used to treat depression costs nearly 22 days wages for only a month's supply. Even when lowest priced generic products are purchased, the treatment of depression (fluoxetine), duodenal ulcer (omeprazole), peptic ulcer (ranitidine) and arthritis

## Medicine Prices, Availability and Affordability in Jordan

(diclofenac) cost several days' wages, and are therefore unaffordable to people on low wages.

**Figure 6. Comparison of affordability of treatments in the public and private sector (days' wages/treatment regimen)**



It should be noted that affordability refers to medicines costs only, and does not include the additional costs of consultations fees and diagnostic tests. Further, many people in Jordan earn less than the lowest government wage; so even treatments which appear affordable will be costly for the poorest segments of the population. In addition, even where individual treatments appear affordable, individuals or families who need multiple medications may quickly face unmanageable medicine costs. An example is provided below of a family where the one adult has a peptic ulcer, and another adult has diabetes. If the family is earning the equivalent of the lowest-paid government worker's salary, total treatment costs are less than a day wages in the public sector and nearly 9 days wages in the private sector if the lowest price generics are purchased. If originator brands are purchased, treatment costs escalate to 22 days wages.

**Table 10. Affordability of treatment for a family with peptic ulcer and diabetes**

	LPG public sector	LPG private sector	OB private sector
Adult – omeprazole	0.3	7.7	19.9
Adult – glibenclamide	~0.1	1.1	2.2
<b>Total days' wages for one month treatment</b>	<b>~0.4</b>	<b>8.8</b>	<b>22.1</b>

### 6. Price components

Prices for medicines vary depending on the manufacturer's selling price and add-ons in the supply chain. For the public sector, where procurement is through tender, prices were lower

## Medicine Prices, Availability and Affordability in Jordan

than the private sector. The price paid for pharmaceuticals in the private sector is determined by the Drug Directorate. The final patient price includes the manufacturer's selling price and freight (cost+freight), administration charges, a margin for wholesalers and a margin for retailers. The margins in all cases are based on a fixed percentage of the cumulative price.

A field survey of price component for individual medicines was not conducted but cumulative mark-ups in the private sector were assessed from regulated margins.

In the private sector, the same margins are applied to all products. Drug stores (wholesalers) receive 15% on the landed cost plus 4% for expenses, while pharmacies receive 20% on the wholesale price plus 6% expenses. These percentages are cumulative and have been in place since 1981. As a result there are strong incentives for both wholesalers and retailers to promote and sell the highest priced medicines and brands as these attract the highest returns.

Table 11 demonstrates the price composition of an originator brand product imported to Jordan. The figures shown are derived by back calculations from the retail patient price. Some medicines, excluding antibiotics such as amoxicillin, are charged up to 5% import fee depending on the country & trade agreements with Jordan, resulting in a cumulative mark-up of about 70%. Price components are the same for originator brands and generics.

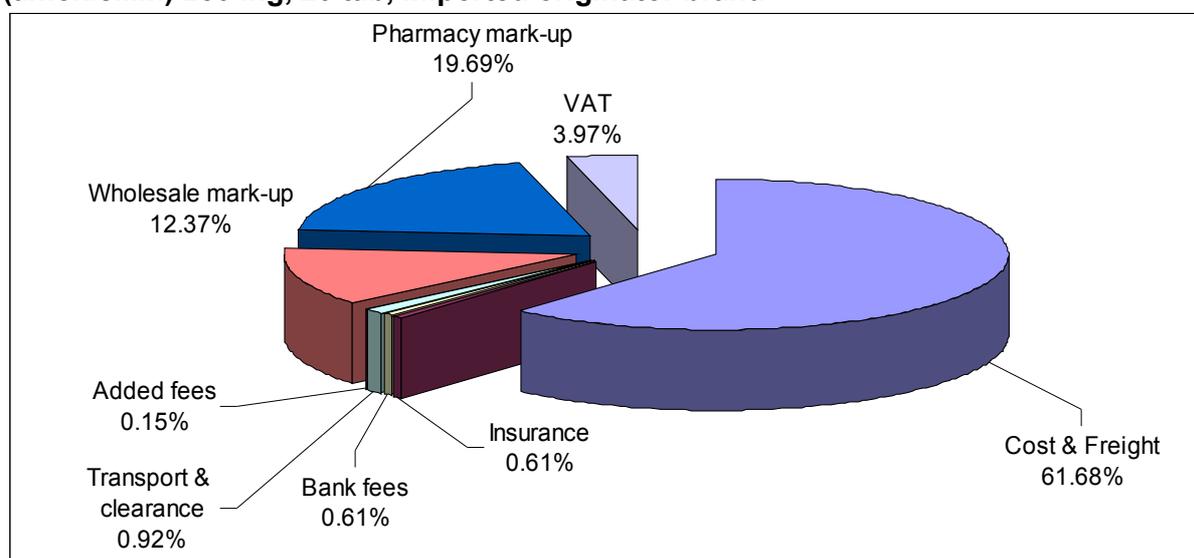
**Table 11. Example of price components of an imported originator brand product sold in private retail pharmacies**

<b>Amoxil (amoxicillin) 250 mg, 20 tab, originator brand, Private Sector, Imported</b>				
<i>Type of charge</i>	<i>Charge basis</i>	<i>Amount of charge</i>	<i>Price of dispensed quantity</i>	<i>Cumulative % mark-up</i>
Cost & Freight			4.04	0%
Insurance	percent	1 %	4.08	1%
Bank fees	percent	1 %	4.12	2.01%
Transport & clearance	percent	1.5 %	4.18	3.54%
Import fees	percent	0 %	4.18	3.54%
Added fees	percent	0.2 %	4.19	3.75%
Wholesale mark-up	percent	19 %	4.99	23.46%
Pharmacy mark-up	percent	26 %	6.28	55.5%
VAT	percent	4 %	6.54	61.78%

Figure 7 shows the contribution of all price components, for imported Amoxil 250 mg tablets, to the final patient price. The largest component is the manufacturer's price plus freight.

## Medicine Prices, Availability and Affordability in Jordan

**Figure 7. Contribution of price components to the final retail price, Amoxil (amoxicillin) 250 mg, 20 tab, imported originator brand**



The Jordanian Food & Drug Administration (JFDA) is responsible for setting the price of medicines for sale in community pharmacies (private sector). The pricing policy used at the time of the survey is described in Annex 6.

## 7. International comparisons

### Public procurement prices

Table 12 compares Jordanian public sector procurement prices for a selection of medicines with those in 5 other countries in the Eastern Mediterranean Region, adjusted to MSH 2003 reference prices. While Jordan paid the lowest price for captopril and ciprofloxacin across the countries, they paid the highest price for beclomethasone inhalers and co-trimoxazole suspension. The price of glibenclamide was lower in Jordan compared to Kuwait, Lebanon, Syria and Tunisia but nearly twice the price paid in Yemen. While the price paid for diazepam in Jordan was lower than the other 5 countries, all were paying high prices.

**Table 12 MPRs for originator brands and lowest priced generics, public procurement prices, 6 countries in the Eastern Mediterranean region (adjusted to MSH2003)**

	Jordan 2004		Kuwait 2004		Lebanon 2004		Syria 2004		Tunisia 2004		Yemen 2006	
	OB	LPG	OB	LPG	OB	LPG	OB	LPG	OB	LPG	OB	LPG
Amitriptyline	3.4			3.1	4.5			2.5	2.5	2.4		0.9
Beclomethasone inhaler		1.4		0.5		0.6		0.6		0.7		0.6
Captopril		0.2		0.3		1.1		1.5		1.2		
Ciprofloxacin		0.7		0.8				1.4		5.1		
Co-trimoxazole		2.3		0.6		1.3		1.1		1.1		
Diazepam	2.5			18.4			11.1	3.3	8.1	3.6		
Glibenclamide		0.7		5		1.5		1.5		1		0.4

## Medicine Prices, Availability and Affordability in Jordan

Note: no adjustments were made for exchange rate, inflation rate, purchasing power parity

No comparison of public sector patient prices is presented as many countries in the region provide medicines free-of-charge in the public sector.

### Private sector

Patient prices in the private sector in Jordan were high in comparison with Syria, but vary with other countries in the region depending on the medicine and type (originator brand or generic). Table 13 compares prices for 6 medicines in Jordan against those in 5 other countries in the Eastern Mediterranean Region, adjusted to MSH 2003 reference prices. The patient price of originator brand atenolol was similar in Jordan, Kuwait and Lebanon, but more expensive than in Yemen and particularly Syria. The lowest priced generic was not as expensive as in Kuwait but higher priced than the other countries (particularly Lebanon, Yemen and Syria). Although the price of originator brand ciprofloxacin was cheaper in Jordan than Kuwait, Lebanon and Yemen, prices were extremely high in all four countries. Although the Jordanian price of generic ciprofloxacin was lower than Kuwait and Lebanon, it was much higher than prices in Yemen and Syria.

**Table 13. MPRs for originator brands and lowest priced generics, private sector patient prices, in 6 countries in the Eastern Mediterranean region (adjusted to MSH2003)**

	Jordan 2004		Kuwait 2004		Lebanon 2004		Syria 2004		Tunisia 2004		Yemen 2006	
	OB	LPG	OB	LPG	OB	LPG	OB	LPG	OB	LPG	OB	LPG
Atenolol	46	18	44	42	42	9	13	4		15	27	5
Beclometasone inhaler	2.9	1.9	3.6		3.2	1.4		0.9		0.7		1.5
Captopril	12	8	15	16	13	5		3	11	7	10	2
Ciprofloxacin	100	22	124	112	117	33		2		22	108	4
Diazepam	51	8			53		12	5	13	7	42	10
Glibenclamide	38	18	66	61	35	7		3	28	7	49	8

Note: all rounded to whole numbers except beclometasone (1 decimal place). No adjustments were made for exchange rate, inflation rate, purchasing power parity

### Discussion

The survey results indicate that in the public sector, the procurement of medicines is relatively efficient as procurement prices were close to international reference prices. Generic medicines are generally sold to patients at similar prices to the procurement price which benefits patients. Originator brand medicines were rarely found in the public sector, although they were procured in the tender, so it was not possible to assess if mark-ups were applied for these types of medicines in the public sector.

For some medicines the government is purchasing originator brands where lower-priced generics are available, which points to a lack of efficiency. The priority for the Ministry of Health is to get the best value for money in its health expenditure. Monitoring procurement prices can reveal opportunities for further savings, if good quality, low cost generics are procured. Such savings can be used to reduce shortages of other essential medicines.

Median availability of generic medicines in the public sector was poor with half of the survey medicines found in 5.1% to 61.1% of the public facilities surveyed. Thus it can be concluded that many patients must purchase medicines from the private sector. In this sector, generics were the predominant product type found. Median availability in the private sector was higher than the public sector but did not reach the ideal of 100%. Medicines with particularly low availability in both the public and private sectors include hydrochlorothiazide and fluphenazine.

Private sector patient prices were, on average, 17 times and 11 times higher for originator brands and lowest priced generics than international reference prices. The overall originator brand premium in the private sector was 222%, showing that patients are paying substantially more to purchase originator products as compared to lowest priced generics.

Patients are paying significantly more (about 10 times more) for generics in the private sector than in the public sector. Given the low availability of generics in the public sector, this is a cause for concern.

For the standard treatment of common conditions, the lowest paid government worker would need to spend less than 1 days' wage to purchase generic medicines from the public sector, up to 8.6 days' wages to purchase lowest priced generic medicines from the private sector, and up to 21.6 days wages to purchase originator brands from the private sector. In the private sector, treatment of some chronic conditions is unaffordable even when low priced generics are used. Further, many people in Jordan earn much less than the lowest government wage so some treatments are clearly too costly for the poorest segments of the population.

Add-on costs, such as bank and other fees, wholesale and retail mark-ups, and VAT contribute to the final price of medicines but the base price (cost & freight) has the largest impact on the final patient price.

The results of this medicine price survey provide insight into the availability, price and affordability of medicines in Jordan. Results may be limited by the fact that data are inherently subject to outside influences such as market fluctuations and delivery schedules.

### Recommendations

The results of this analysis suggest that a mix of policies need to be implemented to make medicines more affordable and available in Jordan, especially for the poor. Although further investigation is required to obtain a more in-depth understanding of the causes and consequences of medicine pricing and availability, the results of this survey provide broad directions for future research and action. It is therefore recommended that the following steps be taken to improve medicine prices, availability, and affordability:

#### Recommendations:

Jordan is in the process of amending the current method for setting the Pricing Criteria to determine prices of medicines. The findings of this study lead to the following recommendations:

#### Improve private sector patients' prices by amending the Pricing Criteria

- Recently the current group of countries which whom the prices of medicines in Jordan are compared been reviewed and extended to include Belgium though other countries like Australia, New Zealand, the Czech Republic, Croatia, Syria and Egypt have to be considered as well for price comparison because these countries have either similarity in population, economic trends, etc. to Jordan or have been using medicine pricing systems that effectively lowered prices. For each country in this group, a list of prices at ex-manufacturer level should be established and regularly updated.
- Reference pricing should be adopted - under this approach, products that provide similar health outcomes should be priced at the same level for reimbursement purposes.
- For new originator products, suppliers should be requested to provide additional data to demonstrate that their products provide additional benefits and the price sought represents value for money. Advice on the clinical and cost effectiveness for these products should be obtained from countries that undertake cost effectiveness evaluations e.g. Australia.
- Pricing reviews should be conducted on a regular basis - the reviews should be undertaken by therapeutic groups, so that all like products are considered together and are priced relative to one another.
- Amending the pricing criteria should be considered regarding pricing of second and subsequent generics, for example these can have a ceiling price of at least 5% below the existing lowest generic price.
- In the registration process, introduce a fast track procedure for the first generic.
- A price component study should be undertaken using the WHO/HAI methodology to measure all distribution costs (mark-ups, taxes, tariffs, fees and other supply chain costs) in the private as well as public sectors, for both locally produced and imported medicines. The elimination of taxes and other charges, and the reduction of mark-ups, can significantly contribute to reducing medicine prices.

#### Improve the public procurement system:

Although Jordan's public sector seems to be doing well in purchasing medicines at prices below or close to the international reference prices used in the WHO/HAI methodology, there

## **Medicine Prices, Availability and Affordability in Jordan**

is still room for improvements. Jordan still applies taxes, both central and local, on the purchase of medicines including VAT. All essential medicines especially those treating chronic diseases should be exempted from duties and taxes. Most of the medicines on the core and supplementary lists were found in the two national medicine stores, which are understandably more closely linked to Jordan's Essential Medicine List. It is still believed in order to improve procurements / tenders prices consideration could be given to the following measures:

- Contracts should only be awarded to originator products when there is no reasonable alternative or the price offered is the lowest.
- Initiate international tenders.
- Where a tender is received for a product from a well recognized company that is not registered in Jordan, the tender should be accepted subject to registration and a fast track registration process should be introduced for such products.
- Purchasing power of available funds should be maximized via the newly established Joint Procurement Administration but purchasing of products through Joint Procurement Administration should be restricted to those on the Essential Drug List.
- Incentives should be created, and education provided for those involved in public sector procurement for making procurement savings.

### **Improve availability of medicines in the public sector**

- Distribution systems should be reviewed and strengthened to achieve better availability of essential medicines at primary health care level.
- Supply and demand should be monitored regularly to ensure accurate forecasting of future needs and innovative financing mechanisms to improve funding of essential medicines in public sector should be considered.
- Introduce electromagnetic cards that can be used to monitor medicine consumption of patients on a monthly basis and control the unnecessary dispensing of medicines; for example medicines on a prescription should be dispensed to cover one month supplies only and should not be re-dispensed until the second month in case of chronic treatments. The Health Insurance Directorate within the MoH in Jordan has started working on the possibility of this new approach, though they lack the fund.
- The essential medicines list should be regularly updated to reflect evidence-based best practice by the Rational Drug Use Unit within the JFDA.
- This Rational Drug Use Unit should introduce and develop a quality-assured therapeutic substitution policy.

### **Improve affordability of medicines supplied through community pharmacy**

- A generic substitution policy should be introduced. The policy should enable pharmacists to substitute between generic equivalents without reference to the prescriber, provided the patients agree; and the doctor has not vetoed such action.
- An education strategy should be implemented to advise prescribers, pharmacists and consumers about the merits of generic medicines.
- A list of all prescription products with current prices should be published and distributed to all practicing doctors and retail pharmacists on a six monthly basis. This list should have all products in ATC order with the brands listed

## **Medicine Prices, Availability and Affordability in Jordan**

under the generic name and be indexed by the generic and brand names. This would enable doctors, pharmacists, and consumers to see the alternative products available within a therapeutic group and the alternative brands available within a chemical entity.

### **Monitoring the impact of policy changes**

- A system should be established to regularly monitor medicine prices, availability and affordability in the public and private sectors to ensure policy changes result in improved affordability and availability. The results of the monitoring should be published on the JFDA website.

This study has helped to provide a broad insight into current issues related to the price, availability and affordability of key medicines for the treatment of common conditions. The results highlight priority areas for action for the Ministry of Health and others in improving access to affordable medicines. Broad debate and dialogue are now needed to identify how best different players can contribute to the prospect of enhancing accessibility and affordability to essential medicines for all in Jordan.

## Medicine Prices, Availability and Affordability in Jordan

### Annex 1: List of Core and Supplementary Medicines Surveyed

Medicine Name	Medicine Strength	Dosage Form	Recommended Pack Size	Core List (yes/no)
1. Aciclovir	200 mg	cap/tab	25	yes
2. Amitriptyline	25 mg	cap/tab	100	yes
3. Amoxicillin	250 mg	cap/tab	21	yes
4. Atenolol	50 mg	cap/tab	60	yes
5. Beclometasone	0.05 mg/dose	inhaler	1 inhaler (200 doses)	yes
6. Captopril	25 mg	cap/tab	60	yes
7. Carbamazepine	200 mg	cap/tab	100	yes
8. Ceftriaxone	1 g/vial	injection	1	yes
9. Ciprofloxacin	500 mg	cap/tab	1	yes
10. Co-trimoxazole	8+40 mg/ml	suspension	100 ml	yes
11. Diazepam	5 mg	cap/tab	100	yes
12. Diclofenac	25 mg	cap/tab	100	yes
13. Diltiazem	60mg	tab	30	no
14. Enalapril	20mg	tab	14	no
15. Fluconazole	150mg	cap/tab	1	no
16. Fluoxetine	20 mg	cap/tab	30	yes
17. Fluphenazine	25 mg/ml	injection	1	yes
18. Furosemide	40mg	tab	20	no
19. Glibenclamide	5 mg	cap/tab	60	yes
20. Hydrochlorothiazide	25 mg	cap/tab	30	yes
21. Losartan	50 mg	cap/tab	30	yes
22. Metformin	500 mg	cap/tab	100	yes
23. Methyldopa	250mg	tab	30	no
24. Nifedipine Retard	20 mg	tab	100	yes
25. Omeprazole	20 mg	cap/tab	30	yes
26. Phenytoin	100 mg	cap/tab	100	yes
27. Ranitidine	150 mg	cap/tab	60	yes
28. Salbutamol	0.1 mg/dose	inhaler	1 inhaler (200 doses)	yes
29. Simvastatin	20mg	tab	30	no

## Medicine Prices, Availability and Affordability in Jordan

### Annex 2. Availability of individual medicines, public and private sector

Medicine Name	Public sector (n =18 outlets )		Private sector (n =20 outlets)	
	Originator brand	Lowest price generic	Originator brand	Lowest price generic
Aciclovir	0.0%	27.8%	40.0%	80.0%
Amitriptyline	5.6%	11.1%	0.0%	80.0%
Amoxicillin	0.0%	77.8%	60.0%	70.0%
Atenolol	0.0%	16.7%	80.0%	95.0%
Beclometasone	5.6%	27.8%	75.0%	35.0%
Captopril	0.0%	61.1%	60.0%	90.0%
Carbamazepine	5.6%	66.7%	75.0%	60.0%
Ceftriaxone	0.0%	11.1%	60.0%	95.0%
Ciprofloxacin	0.0%	77.8%	35.0%	95.0%
Co-trimoxazole	0.0%	83.3%	65.0%	95.0%
Diazepam	0.0%	55.6%	80.0%	60.0%
Diclofenac	0.0%	0.0%	55.0%	75.0%
Diltiazem	0.0%	44.4%	70.0%	55.0%
Enalapril	0.0%	5.6%	60.0%	95.0%
Fluconazole	0.0%	16.7%	70.0%	85.0%
Fluoxetine	0.0%	22.2%	55.0%	65.0%
Fluphenazine	0.0%	0.0%	15.0%	0.0%
Furosemide	0.0%	72.2%	80.0%	90.0%
Glibenclamide	0.0%	77.8%	80.0%	95.0%
Hydrochlorothiazide	0.0%	5.6%	5.0%	40.0%
Losartan	0.0%	0.0%	55.0%	65.0%
Metformin	0.0%	0.0%	90.0%	80.0%
Methyldopa	0.0%	88.9%	20.0%	70.0%
Nifedipine Retard	0.0%	27.8%	5.0%	60.0%
Omeprazole	0.0%	27.8%	65.0%	95.0%
Phenytoin	27.8%	0.0%	65.0%	0.0%
Ranitidine	0.0%	50.0%	80.0%	85.0%
Salbutamol	0.0%	5.6%	80.0%	75.0%
Simvastatin	5.6%	0.0%	55.0%	85.0%

## Medicine Prices, Availability and Affordability in Jordan

### Annex 3. Individual Median Price Ratios, public sector procurement prices

Medicine Name	Originator brand MPR	Lowest price generic MPR
Aciclovir	0.27	-
Amitriptyline	3.42	-
Amoxicillin	0.86	-
Atenolol	-	0.66
Beclometasone	-	1.37
Captopril	-	0.22
Carbamazepine	-	0.74
Ceftriaxone	-	0.29
Ciprofloxacin	-	0.66
Co-trimoxazole	-	2.35
Diazepam	2.46	-
Diclofenac	-	-
Diltiazem	0.72	-
Enalapril	1.38	-
Fluconazole	2.25	-
Fluoxetine	0.58	-
Fluphenazine	2.03	-
Furosemide	2.05	-
Glibenclamide	-	0.69
Hydrochlorothiazide	-	2.74
Losartan	-	0.13
Metformin	-	0.39
Methyldopa	0.68	-
Nifedipine Retard	-	0.32
Omeprazole	-	0.16
Phenytoin	6.53	-
Ranitidine	-	0.33
Salbutamol	-	0.57
Simvastatin	0.85	-

Note: the high reference price for losartan influenced the low MPR for this medicine

## Medicine Prices, Availability and Affordability in Jordan

### Annex 4. Individual Median Price Ratios, public sector patient prices

Medicine Name	Originator brand MPR	Lowest price generic MPR
Aciclovir	-	0.40
Amitriptyline	-	-
Amoxicillin	-	1.13
Atenolol	-	-
Beclometasone	-	0.63
Captopril	-	0.29
Carbamazepine	-	0.85
Ceftriaxone	-	-
Ciprofloxacin	-	1.07
Co-trimoxazole	-	1.33
Diazepam	-	2.41
Diclofenac	-	-
Diltiazem	-	0.82
Enalapril	-	-
Fluconazole	-	-
Fluoxetine	-	1.72
Fluphenazine	-	-
Furosemide	-	2.64
Glibenclamide	-	0.84
Hydrochlorothiazide	-	-
Losartan	-	-
Metformin	-	-
Methyldopa	-	0.95
Nifedipine Retard	-	0.33
Omeprazole	-	0.24
Phenytoin	5.95	-
Ranitidine	-	0.62
Salbutamol	-	-
Simvastatin	-	-

Note: MPR was calculated if the medicine was found 4 or more facilities

## Medicine Prices, Availability and Affordability in Jordan

### Annex 5. Median Price Ratios, private sector patient prices

Medicine Name	Originator brand MPR	Lowest price generic MPR
Aciclovir	20.49	7.99
Amitriptyline	-	8.65
Amoxicillin	26.39	10.74
Atenolol	45.75	18.39
Beclometasone	2.94	1.95
Captopril	12.38	8.24
Carbamazepine	11.68	5.78
Ceftriaxone	10.69	6.81
Ciprofloxacin	100.32	22.06
Co-trimoxazole	15.06	4.66
Diazepam	50.70	8.05
Diclofenac	63.52	28.72
Diltiazem	16.78	11.92
Enalapril	159.95	69.17
Fluconazole	127.61	70.14
Fluoxetine	51.61	20.56
Fluphenazine	-	-
Furosemide	54.87	13.50
Glibenclamide	38.37	18.45
Hydrochlorothiazide	-	49.50
Losartan	1.30	0.85
Metformin	6.61	3.24
Methyldopa	4.56	1.90
Nifedipine Retard	-	10.76
Omeprazole	14.27	5.56
Phenytoin	9.30	-
Ranitidine	24.29	13.12
Salbutamol	2.60	1.10
Simvastatin	17.05	10.50

Note: MPR was calculated if the medicine was found 4 or more facilities.  
The high reference price for losartan influenced the low MPR for this medicine

### Annex 6. Pharmaceutical Pricing Policies in Jordan

The Jordanian Food & Drug Administration (JFDA) is responsible for setting the price of medicines for sale in community pharmacies (private sector).

Article 11 of the Drug and Pharmacy Law determines the membership of the Pricing Committee which includes the Director of the JFDA; the Director of Procurement; the Head of the Pricing Department; an internist; a pharmacist specialized in pharmacology or clinical pharmacy; and two experts (one being an expert in cost accounting).

While the Pricing Committee is involved in the determination of the price of medicines distributed through community pharmacies, it is not involved in the pricing of medicines obtained through tenders.

#### **Determining the price of newly registered medicines (Originator Brand) this is the pricing policy that was adapted at the time of the survey in 2004**

The price of a new chemical entity (**originator brand**) is determined as the lowest price resulting from the application of the following methods:

- (a) If the medicine is purchased on a CIF basis, the price is the factory listed price plus customs duties, bank charges, insurance, clearing and inland transport plus drug store and pharmacy margins. If the goods are acquired FOB, shipping costs are added to the above.
- (b) The selling price to the public in the country of origin after deducting value added tax and the wholesaler and retailer margins. Then adding to the resultant figure, shipping costs, bank charges, insurance, clearing and inland transport plus the drug store and pharmacy margins.
- (c) The medium price resulting from the prices to the public in the following countries (calculated using method (b) above) – Britain, France, Spain, Italy, Germany, Greece and the Netherlands. There needs to be at least 3 countries to apply this medium pricing arrangement.
- (d) The price computed from the export price to the Saudi Market – for un-registered medicines in Saudi Arabia, its price in Jordan shall be reviewed upon its registration there. The agent is required to advise the JFDA of the Saudi Arabia price within 4 months of its registration. Saudi Arabia is a neighbor and has a much better negotiating power and hence the Jordanian Government wants to use this power to gain efficiencies in its medicine purchases.
- (e) If the medicine is registered and priced in the country of origin only, then it shall be priced on the basis of the prices for medicines with close chemical composition and/or therapeutic effect – the relativity shall be determined by the Committee for registering new medicines using a formula approach.

## Medicine Prices, Availability and Affordability in Jordan

Where a medicine has a registered **generic equivalent**, the Jordanian price is determined as the lowest price resulting from the application of the following methods:

- (a) If the medicine is purchased on a CIF basis, the price is the factory listed price plus customs duties, bank charges, insurance, clearing and inland transport plus drug store and pharmacy margins. If the medicine is acquired FOB, shipping costs are added to the above.
- (b) The selling price to the public in the country of origin after deducting value added tax and the wholesaler and retailer margins. Then adding to the resultant figure, shipping costs, bank charges, insurance, clearing and inland transport plus the drug store and pharmacy margins.
- (c) The export price to Saudi Arabia. If it is not registered in Saudi Arabia, the price in Jordan is to be reviewed within three months of registration in Saudi Arabia.
- (d) The asking price should not exceed 80% of the underlying price when the medicine is registered.

The applicant has 30 days in which to appeal a pricing decision of the Director General of the JFDA. Such an appeal will be referred to the Drug Pricing Committee who has 30 days to make its recommendation. A price is considered inoperative if the applicant has not accepted it within 6 months of notification.

The Director General of the JFDA issues a schedule of exchange rates in July each year and these are determined from the average rate for June using exchange rates published by the Central Bank of Jordan. Prices of products can be revised if the variation in the exchange rates exceeds 5% for three consecutive months.

The Director General can cancel the registration of a drug or prohibit its re-registration if:

- (a) its pricing was done on the basis of false information submitted by the company;
- (b) the price in the country of origin is reduced and such a reduction was not reflected in the Jordanian price and the company did not notify the reduction within 4 months of the reduction occurring in the country of origin
- (c) the company did not submit the export price to Saudi Arabia within 4 months of its pricing there.

The Pricing Committee revises prices of new medicines after two years of registration and the price of all products are reviewed upon renewal of registration.

Where there is a price reduction in the originator brand, all generics must reduce their price, except where the price is due to an exchange rate movement or at the request of the originator.

The pharmacist- in- charge of the drug store is required to submit data on:

- country of origin prices – at ex-factory level, price to pharmacy, price to the public and any value added tax applying
- the same data for the countries in the reference basket.

The Technical Manager of the local company requests a retail price. The final regulated price is negotiated between the JFDA and the manufacturer, with agreement reached in most cases.