

# **Medicine prices in Tunisia: Report of a survey**

**[translation of the French original]**

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- \* Mr. Taoufik ANANE, Manager and President of the National Union of Mutual Insurance Companies (U.N.A.M)
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- \* Ms. Amel BEN RACHID, Supervisor and Pharmacist (D.P.M/M.S.P)
- \* Mr. Ahmed BEN TOUMINE, Supervisor and Private Retail Pharmacist
- \* Mr. Jalel Eddine HILA, Supervisor and Pharmacist (P.C.T.)
- \* Mr. Salah MANSOUR, Data analyst (U.N.A.M.)

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- \* Mr. Nabil SAID, President of C.N.O.P.T.
- \* Mr. Naceur GHARBI P, D.G. of P.C.T.
- \* Dr. Philippe SWENNEN, Project director, A.I.M.

## SUMMARY

The U.N.A.M, in close cooperation with the M.S.P., the C.N.O.P.T. and the P.C.T., carried out an investigation to measure the prices of medicines in Tunisia by using an international standardized methodology. Data on the prices of 30 medicines were collected in the public and private for-profit sectors in the capital, Tunis, and in 3 other areas of Tunisia. An estimate of the availability of the medicines was also obtained. The cost of the treatments was calculated for ten medicines and was compared with the minimum daily wages of an unqualified government worker to obtain an estimate of affordability. In addition, data was collected on the components of the prices of selected medicines.

### 1) Introduction and general context

The medicine price survey in Tunisia took place from 22 to 26 March 2004. The goal was to document and compare the prices of selected medicines in the various sectors of the Tunisian health system, and to compare them with those of other countries.

The field work was based on a methodology developed by the World Health Organization (WHO) and Health Action International (HAI) by using a limited list of medicines to compare the prices of medicines in the various sectors. This methodology is designed to collect, analyze and interpret the prices of medicines in a standardized way. The methodology also includes the identification of price components by tracking medicines through the distribution chain.

This study aimed to answer the following questions:

- What is the price level of medicines in Tunisia?
- What is the difference between the prices of innovator brands and their generic equivalents?
- What is the level of the various commercial margins which contribute to the retail prices of medicines?
- What is the affordability of medicines for people with low income?

The study was undertaken by the National Union of the Mutual Insurance Companies in Tunisia, with the approval of the Ministry for Public Health and in collaboration with the National Council of the Order of the Pharmacists of Tunisia.

General data on Tunisia (2003):

- General population: 9,9 million inhabitants,
- Working age population: 3,3 million inhabitants
- Poverty level: 4,2%
- Population growth rate: 1,08%
- Infant mortality rate: 22,8 per thousand
- Life expectancy: 72,9 years (70,1years for males / 74,2 years for females)
- Infant vaccination rate: 90%
- Social Security coverage: 84,3%
- GNP: 2000 \$ per capita

The information collected on the health sector and the pharmaceutical sector is attached in Annex I.

## 2) Methods

The prices of selected essential medicines were collected in both the public sector and in private pharmacies. Thirty substances were included in the investigation. Among them, 20 had been pre-selected in the WHO/HAI basket of medicines for international comparisons [core medicines], and ten others were added in a supplementary list at the country level. The list of survey medicines is provided in Annex II.

Up to three products were studied for each substance:

- The innovator brand
- The most sold generic equivalent
- The lowest priced generic equivalent

The prices were measured at the central level, as well as in the public medical facilities and pharmacies of four zones distributed throughout Tunisia:

Zone I: Tunis, Marsa, Bizerte, Zaghuan and Nabeul

Zone II: Béja, Jendouba, Tabarka, Kef and Siliana

Zone III: Sousse, Mahdia, Kairouan, Sfax and Sidi Bouzid

Zone IV: Gabès, Mednine, Tataouine and Jerba

As medicines are provided free to patients at public medical facilities, the prices collected at these facilities refer to the public and private health insurance schemes which cover the cost of medicines for patients.

In all the sectors, the availability of medicines at the time of the collection of data was measured in parallel to medicine prices.

The use of an international reference price for international standardized comparisons is explained in the "Results" section of the report. All prices were converted to American dollars by using the "buy" rate of exchange on 22 March 2004 (the first day of the study). We also identified the components of the prices of the medicines in order to estimate the add-on costs as medicines proceed through the distribution chain. Finally, to understand what the selling prices of medicines means to ordinary people, we compared the costs of some standard treatments to the minimum daily wage of an unqualified government employee.

### Sampling

The sampling procedure described in the WHO/HAI survey manual was used to obtain a representative selection of public medical facilities and private pharmacies. In all, 21 public medical facilities and 41 private pharmacies, were selected in several governorates in four survey areas (Capital, North East, Northern West, Centre and South).

## Survey medicines

Ten medicines from the WHO/HAI basket of 30 core medicines were excluded from the survey as they did not correspond to the list of essential medicines of Tunisia, which sometimes recommends alternate strengths or other substances of pharmaceutical equivalence. Moreover, in order to study medicines used in the treatment of important chronic pathologies (e.g. asthma, hyperlipidaemia), the following ten substances were added as supplementary medicines:

- ❑ Amoxicillin 500mg tab (strength different from that of the core list)
- ❑ Benzathine Penicillin 1,2MU inj
- ❑ Chloroquine 100mg tab (most used antimalarial)
- ❑ Chlorothiazide 500mg tab (strength and type different from that of the core list)\*
- ❑ Dexamethasone 4mg inj
- ❑ Metformin 850mg tab (strength different from that of the core list)
- ❑ Paracetamol 500mg tab
- ❑ Pravastatin 20mg tab\*
- ❑ Simvastatin 20mg tab
- ❑ Theophylline LP 300mg cap\*

\* No MSH international reference price, therefore excluded from price analysis.

### 3) Collection of data

In the public sector, thanks to the document "INDEX P.C.T." provided by the Central Stores (P.C.T), we obtained an up-to-date (2003) list of medicines with their public procurement prices. In the public medical facilities, where medicines are dispensed free-of-charge, we checked the availability of the survey medicines as well as the prices charged to the public and private health insurance schemes (CNRPT and CNSS, respectively) which cover the cost of medicines for patients. In the private sector, the availability and patient prices of the medicines were collected at the time of the visit in selected private pharmacies. The components of medicine prices were identified by questioning the organizations concerned.

A standardized data collection form was used, and the investigators were trained in a two-day seminar to ensure the reliability and the reproducibility of the investigation. A pilot test was also carried out.

The investigation team was made up personnel from the health field, with Pharmacist Technician students recruited as data collectors. Each team (one per zone) had a pharmacist as a supervisor. Data collection was carried out from 22 to 25 March 2004.

#### 4) Results and discussion

The results obtained are represented in the following tables.

##### 4 - 1 Prices of medicines in the private sector

**Table 1: Summary median prices ratios [MPRs] in the private sector**

	No. of substances found	Median MPR	Quartile 25%	Quartile 75%
<b>Innovator brand</b>	19	<b>11,89</b>	<b>4,78</b>	<b>20,91</b>
<b>Most sold generic</b>	19	<b>6,82</b>	<b>2,20</b>	<b>12,02</b>
<b>Lowest priced generic</b>	19	<b>6,82</b>	<b>2,20</b>	<b>12,02</b>

In the private for-profit sector, it was found that the prices of the 19 innovator brand medicines found were about 12 times greater than the international reference prices. Half (50%) of these innovator brands were 5 to 21 times the reference price.

Among the generic equivalent medicines, where multiple products were found, prices did not differ very much between the most sold generic equivalent and the least expensive generic equivalent. However, most substances were available only as one generic product which was recorded both as the most sold generic equivalent and as the lowest priced generic equivalent.

The ratios of the median prices of the most sold and least expensive generics were 7 times higher than the international reference price. Half (50%) of these generic medicines were sold at 2 to 12 times the reference price.

**Table 2: Examples of median price ratios for 4 medicines**

Generic name		MPR	Quartile 25%	Quartile 75%
Amitriptyline 25 mg	Innovator brand	3,74	3,74	3,74
	Most sold generic	ND	ND	ND
	Lowest priced generic	ND	ND	ND
Amoxicillin 500 mg	Innovator brand	7,46	7,46	7,46
	Most sold generic	4,61	4,61	4,61
	Lowest priced generic	4,61	4,61	4,61
Diclofenac 25 mg	Innovator brand	24,49	24,49	24,49
	Most sold generic	12,69	12,69	12,69
	Lowest priced generic	12,69	12,69	12,69
Glibenclamide 25 mg	Innovator brand	28,17	28,17	28,17
	Most sold generic	6,99	6,99	6,99
	Lowest priced generic	6,99	6,99	6,99

For the majority of the medicines in the study, the variation in the prices of the most sold generic equivalent and the lowest priced generic equivalent was null or not significant. However, when only those medicines available as both innovator brands and generic equivalents were analyzed, the innovator brand was in general 1.8 times more expensive than the most sold or lowest price generic equivalent.

When comparing the prices of all the survey medicines, the prices of the most sold and least expensive generic equivalents ranged from 0.71 to 32 times the international reference price. Beclomethasone aerosol 50 µg was 0,71 times the international reference price, while Fluoxetine 20mg was 32 times the international reference price.

#### 4 - 2 Prices of medicines in the public sector

**Table 3: Procurement prices of generic medicines: examples of median price ratios for 3 medicines, and summary data for all medicines found**

	MPR procurement price	On essential medicines list	MPR of prices paid by patients*	Availability in health facilities %
<b>Amoxicillin 500 mg</b>	1,26	No	-	95,2
<b>Ceftriaxone 1g inj.</b>	0,78	Yes	-	33,3
<b>Glibenclamide 5 mg</b>	0,98	Yes	-	100
<b>Median MPR / Median availability (19 medicines)</b>	<b>1,26</b>		-	64,3

\*Medicines are dispensed free of charge in public medical facilities

For the public sector, the central purchasing prices of the generic medicines in the survey were 26% higher than their international reference prices (Table 3). This suggests efficient purchasing as MSH uses free on board (FOB) prices, while the Tunisian prices include the cost of acquisition, insurance and freight (CIF or CAF prices). The median price ratios of medicine prices "paid by patients" do not exist because public medical facilities dispense medicines belonging to the hospital list free of charge.

#### 4 - 3 Comparison of the prices of medicines in the public and private sectors

**Table 4: Median MPRs for medicines found in both public and private sectors**

	Median MPR Public sector*	Median MPR Private sector	Ratio private/public %
<b>Innovator brand (n = 7 medicines)</b>	5,71	11,89	208,1
<b>Most sold generic (n = 13 medicines)</b>	1,26	4,59	364,7
<b>Lowest priced generic (n = 16 medicines)</b>	1,39	5,51	397,0

\*Prices paid by public/private health insurance schemes

When one compares the prices in the public and private sectors using matched pair analysis, it is obvious that the prices are lower in the public sector (Table 4). For example, for the 16 lowest priced generic medicines found in both sectors, private sector prices were close to four times those of the public sector. However, it should be noted that while private sector prices refer to prices paid by patients, public sector prices are those paid by public and private health insurance schemes (CNRPT and CNSS, respectively) which cover the cost of medicines for patients.

It was impossible within the framework of this investigation to identify if the innovator brands or the most sold generic equivalents were indeed the products most sold in the private sector. However, the retail private market is studied by two service companies which have more than ten years of statistical data allowing us to obtain this information.

**Table 5: Comparison of the MPRs for 2 substances found in both public and private sectors**

Generic name	Type	Private	Public*
Diazepam 5 mg	Innovator brand	12,76	8,12
	Most sold generic	7,25	3,64
	Lowest priced generic	7,25	3,64
Nifedipine 20 mg	Innovator brand	11,89	1,28
	Most sold generic	2,15	1,22
	Lowest priced generic	2,15	1,22

\*Prices paid by public/private health insurance schemes

**Table 6: Comparison of the prices of 100 dosage units for 2 substances found in both public and private sectors (prices in Tunisia Dinars)**

Generic name	Type	Product name	Private	Product name	Public*
Diazepam 5 mg	Innovator brand	Valium	5,470	Valium	3,480
	Most sold generic	Diazépam	3,110	Diazépam	1,560
	Lowest priced generic	Diazépam	3,110	Diazépam	1,560
Nifedipine 20 mg	Innovator brand	Adalate LP	31,470	Adalate LP	3,400
	Most sold generic	Nifedicator LP	5,680	Nifedicator LP	3,230
	Lowest priced generic	Nifedicator LP	5,680	Nifedicator LP	3,230

\*Prices paid by public/private health insurance schemes

The price differences between public and private sectors in Tunisia are further illustrated in Tables 5 and 6 by using the data of two substances as examples. Table 5 compares the ratios of unit prices to international reference prices between the two sectors. Table 6 compares the prices in Dinar for 100 dosage units. In the latter table, the various commercial names are quoted. Once more, the data reveal notable differences not only between the two sectors, but also between the innovator brands and the generic equivalents in private pharmacies.

#### 4 - 4 Availability

**Table 7: Comparison of median medicine availability in the private and public sectors**

	Private sector	Public sector
Innovator brand	76,80%	0%
Most sold generic	92,7%	38,1%
Lowest priced generic	95,1%	64,3%

In the private sector, the median availability of the medicines surveyed is 77% for innovator brand medicines, 93% for most sold generic equivalents and 95% for the lowest priced generic equivalents. Availability is lower in the public sector, where the median availability of the medicines surveyed is 0% for innovator brand medicines, 38% for most sold generic equivalents and 64% for the lowest priced generic equivalents.

One possible explanation for the relatively low availability of medicines in the public sector is that the basket of medicines chosen for the investigation does not entirely correspond with the list of medicines provided through public sector medical facilities. Although ten medicines considered as essential in Tunisia were added to the supplementary list, availability in the public sector remains low. It is also important to note that only 6 of the 30 survey medicines has an innovator brand product which is used, or able to be used, in the public sector. Thus for 80% of the survey medicines one would not expect to find innovator brand products in the public sector.



Other possible causes of low public sector availability for the lowest priced generic equivalents are stock shortages or decisions regarding hospital expenditure control. However, it should be noted that in the public sector, medicines are stocked according to active substance and not according to individual products (innovator or generic). The ability to use identical products interchangeably is one of the basic rules in the public sector.

#### 4 - 5 Affordability

The daily wage of the lowest paid government worker was used to calculate the affordability of standard treatments for 10 conditions (Annex III). Results are presented as the number of days' wages of the lowest paid government worker needed to purchase a course of treatment. At the time of the survey, the minimum monthly wage of an unqualified government employee was 211,119 Dinars, or 7,0373 Dinars per day. Table 7 illustrates the affordability of treatment for a chronic and an acute condition in the private sector. Affordability was not calculated for the public sector, as patients receive their medicines for free.

**Table 8: The number of days wages of the lowest paid government worker needed to purchase a course of treatment for peptic ulcer and paediatric respiratory infection**

Treatment	Type	Private Pharmacies	
		Median price	No. of days' wages
Peptic ulcer: Ranitidine 150mg 2/day x 30 days	Innovator brand	49,650	7,1
	Most sold generic	31,740	4,5
	Lowest priced generic	31,740	4,5
Paediatric respiratory infection: Cotrimoxazole 8- 40mg/ml 10ml/day x 7 days	Innovator brand	2,300	0,3
	Most sold generic	2,000	0,3
	Lowest priced generic	2,000	0,3

For the treatment of a paediatric respiratory infection using either innovator brand or generic cotrimoxazole, an unqualified government worker will have to pay the equivalent of 0,3 days wages to buy the treatment in the private sector. For the monthly treatment of peptic ulcer using ranitidine, an unqualified government worker will have to pay the equivalent of 7,1 days wages if the innovator product is purchased from the private sector. If the lowest priced generic equivalent is purchased, the worker will still need to spend 4.5 days wages.

It should be stated that in the private sector, within the framework for encouraging local manufacturing, generic manufacturers generally adopt prices which are approximately 30% less than the price of the innovator brand medicine. In the case of ranitidine, however, the price of the generic is approximately 35% less expensive than that of the innovator. This is because ranitidine is purchased by invitation to tender, which is conducted according to pharmaco-therapeutic class rather than I.N.N. name.

#### 4 - 6 Price components and cumulated mark-ups

The components of medicine prices in Tunisia vary by sector (public/private) and by location of production (imported/locally produced):

	Imported medicines		Locally produced medicines	
	Private sector	Public sector	Private sector	Public sector
VAT	--	--	6%	6%
Wholesale mark-up	8.7%	10%	8.7%	10%
Retail mark-up	31.6% to 42.9% (regressive mark-up)		31.6% to 42.9% (regressive mark-up)	

The components of medicine prices are the same for innovator brands and generic medicines. As shown above, VAT is only applied to products which are manufactured locally. Two examples are provided in Table 9.

**Table 9: Comparison of the price components of 14 units of omeprazole 20 mg capsule**

Composition	Innovator product, imported, Private sector		Generic equivalent, locally manufactured, public sector	
	%	Total	%	Total
		27.54		3.592
VAT (included in the wholesale price)	-	27.54	6	3.808
Wholesale margin	8,7	29.93	10	4.189
Pharmacist margin	31.6	39.39	-	4.189
<b>Final price</b>		<b>39.39</b>		<b>4.189</b>
<b>Cumulative markup</b>		<b>43.05%</b>		<b>16.60%</b>

For 14 units of omeprazole 20 mg, the cumulative mark-up was 43% for the imported innovator brand product in the private sector, versus 17% for the locally produced generic equivalent in the public sector.

## **5) Conclusions**

- The public health sector in Tunisia is relatively efficient in procurement purchases and, thanks to international tenders, achieves reasonably low prices compared to the private sector.
- However, the figures concerning the availability of the medicines in the public sector are relatively poor compared to the private sector. Some possible causes are outlined in Section 4.4.
- Prices are considerably higher in the private sector, and innovator brands are more widely used due to the promotional sales forces on the prescribers. It should be noted that there is no legal provision for providing incentives for generic substitution or dispensing in the private sector.
- The prices of innovator brands are considerably higher than the prices of generic equivalents.
- The prices of generic equivalents vary, and the least expensive equivalent is not always the most sold.

## **6) Recommendations**

- To sensitize physicians on rational prescribing, namely on the use of international non-proprietary names.
- To enable generic substitution in the public and private sectors through a reinforcement of the legal framework.
- To involve the dispenser in this harmonization of the legal framework, for example, by allowing generic substitution. Indeed, it is our opinion that this is an essential element in the control of the cost of medicines.

## **7) Areas for future research**

- Adapt methodology to country context
  - by establishing medicine lists/baskets by region or sub-region
  - by studying procurement prices for medicines according to therapeutic class
- Analyse public and private sector prices for a basket of medicines corresponding to 80% of total expenditures or total volume, in each sector.
- Assemble a working group to further examine and interpret the information and results derived from the survey.
- Develop global guidelines/methodology for "Good Purchasing Practices", which could be adopted by all countries that have conducted medicine price surveys, and could be improved periodically based on country experience.

## **Annexes**

### **Annex I:**

#### **Tunisian Pharmaceutical Sector**

Date: 22 Mars 2004

Population: 9,9 million inhabitants

Daily wages of an employee in the public sector paid with the minimum wage: 7,0373 Dinars

Buying rate of exchange in American Dollars of the first day of the collection of data: 1,00

American Dollar = 1,225 Tunisian Dinar

Sources of information:

- The Tunisian National Union Of Mutual Insurance Companies
- Directorate of Pharmacy and Medicines - Tunisian Ministry for Public Health (2003)
- The National Council of the Order of the Pharmacists of Tunisia
- Central Pharmacy of Tunisia

**Annex II:****Table 1: List of core survey medicines**

<b>Generic name</b>	<b>Dose</b>	<b>Dosage form</b>	<b>Pharmacological category</b>
Aciclovir	200 mg	Tablet	Antiviral
Amitriptyline	25 mg	Tablet	Antidepressant
Atenolol	50 mg	Tablet	Antihypertensive
Beclometasone	50 mg / dose	Inhaler	Antiasthmatic
Captopril	25 mg	Tablet	Antihypertensive
Carbamazepine	200 mg	Tablet	Antiepileptic
Ceftriaxone	1g	Powder for injection	Antibacterial
Ciprofloxacin	500 mg	Tablet	Antibacterial
Cotrimoxazole	(8+40) mg/ml	Paediatric Suspension	Antibacterial
Diazepam	5 mg	Tablet	Anxiolytic
Diclofenac	25 mg	Tablet	Anti-inflammatory
Fluconazole	200 mg	Tablet/capsule	Antifungal
Fluoxetine	20 mg	Tablet/capsule	Antidepressant
Glibenclamide	5 mg	Tablet	Antidiabetic
Losartan	50 mg	Tablet	Antihypertensive
Nifedipine	Retard 20 mg	Tablet	Antihypertensive
Omeprazole	20 mg	Capsule	Antiacid
Phenytoin	100 mg	Tablet	Antiepileptic
Ranitidine	150 mg	Tablet	Antiacid
Salbutamol	0.1 mg / dose	Inhaler	Antiasthmatic

**Table 2: List of supplementary survey medicines**

<b>Generic name</b>	<b>Dose</b>	<b>Dosage form</b>	<b>Pharmacological category</b>
Amoxicillin	500 mg	Tablet/capsule	Antibacterial
Benzathine Benzylpenicillin	1,2M UI	Powder for injection	Antibacterial
Chloroquine	100 mg	Tablet	Antimalarial
Chlorothiazide	500 mg	Tablet	Antihypertensive
Dexamethasone	4 mg	Solution for injection	Anti-inflammatory
Metformin	850 mg	Tablet	Antidiabetic
Paracetamol	500 mg	Tablet	Analgesic
Pravastatin	20 mg	Tablet	Hypolipidaemic
Simvastatin	20 mg	Tablet	Hypolipidaemic
Theophylline	Retard 300 mg	Capsule	Antiasthmatic

**Annex III: Affordability of selected conditions: Number of days' wages of the lowest paid government worker required to purchase standard treatments from the private sector**

	Treatment duration (days)	Total number of units per treatment	Product type	Median treatment price	Days' wages
<b>DIABETES</b>					
Glibenclamide 5mg gel/cap	30	60	Innovator	8,49	1,2
			Most sold generic	2,11	0,3
			Lowest price generic	2,11	0,3
<b>HYPERTENSION</b>					
Atenolol 50mg gel/cap	30	30	Most sold generic	5,14	0,7
			Lowest price generic	5,14	0,7
<b>ADULT RESPIRATORY INFECTION</b>					
Amoxicillin 500mg gel/cap	7	21	Innovator	7,17	1,0
			Most sold generic	4,43	0,6
			Lowest price generic	4,43	0,6
<b>PAEDIATRIC RESPIRATORY INFECTION</b>					
Cotrimoxazole susp. 8+40mg/ml	7	70	Innovator	2,30	0,3
			Most sold generic	2,00	0,3
			Lowest price generic	1,98	0,3
<b>GONNORHOEA</b>					
Ciprofloxacin 500mg gel/cap	1	1	Most sold generic	1,00	0,1
			Lowest price generic	0,86	0,1
<b>ARTHRITIS</b>					
Diclofénac 25mg gel/cp.	30	60	Innovator	9,18	1,3
			Most sold generic	4,76	0,7
			Lowest price generic	4,76	0,7
<b>DEPRESSION</b>					
Amitriptyline 25mg gel/cap	30	90	Innovator	3,13	0,4
<b>ASTHMA</b>					
Salbutamol inhaler 0,1mg/dose	As needed	200	Innovator	2,04	0,3
<b>PEPTIC ULCER</b>					
Ranitidine 150mg gel/cp.	30	60	Innovator	49,65	7,1
			Most sold generic	31,74	4,5
			Lowest price generic	31,74	4,5
<b>MALARIA</b>					
Chloroquine 100mg cap	30	60	Innovator	0,85	0,1