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Medicine prices, availability, affordability and price components

Medicine prices matter

Rapidly rising costs of health care and high medicine prices are a growing concern worldwide, especially in developing and transitional countries where patients often have to pay the full price of medicines. This brief report about the prices and availability of essential medicines in the Islamic Republic of Iran is one of a series of papers summarizing the results of medicine price and availability surveys carried out around the globe using a standard survey methodology developed by the World Health Organization and Health Action International (HAI)[1].

This survey was conducted in 2007 by the Ministry of Health, which studied the price, availability and affordability of 48 medicines in the public sector, private sector (private retail pharmacies) and private pharmacies located in public hospitals.

The survey found that in the Islamic Republic of Iran:

- Government procurement prices of medicines are reasonable.
- Patients pay the same price for medicines in the public and private sectors (set by government).
- Overall patient prices of lowest-priced generics are reasonable.
- Few originator brands are marketed, but where found they are on average three to seven times the price of generic equivalents depending on the sector.
- The availability of generics was good in all three sectors.
- Almost all surveyed medicines are affordable for workers on the minimum wage.
- The sum of import tariffs, mark-ups and dispensing fees can double the price of some medicines.

Generally, across the WHO Eastern Mediterranean Region, public sector procurement prices have been reasonable, people have to pay for medicines in the private sector at frequently unaffordable prices, and there is a need for stronger government action to introduce or improve national medicines policies and effective pricing policies[2].

[1] WHO/HAI. *Measuring medicine prices, availability, affordability and price components.* 2nd Ed. Geneva, World Health Organization, 2008. Available from http://www.haiweb.org/medicineprices

[2] WHO/HAI. *Medicine prices, availability, affordability and price components: a synthesis report of medicine price surveys undertaken in selected countries of the WHO Eastern Mediterranean Region*, Cairo, WHO Regional Office for the Eastern Mediterranean, 2009.

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The population of the Islamic Republic of Iran is around 71.2 million (2007), with a per capita GDP of US$ 5350 (World Bank 2008). Total per capita expenditure on health in 2006 (WHO) was US$ 259, per capita government expenditure on health was US$ 121, with total expenditure on health at 6.8% of GDP. Out-of-pocket expenditure was 50.7% of total health expenditure.

The National Pharmaceutical Authority, under the Ministry of Health and Medical Education, oversees the provision and utilization of medicines in the country through the Deputy for Food and Drugs. There are about 70 local pharmaceutical manufacturers (market share 95% in volume and 64% in value in 2008), about 50 importers, 29 distributors and their wholesalers (the top five distributors have more than 80% market share) and over 8200 pharmacies. There is no centralized bulk purchasing for public health facilities. All public health facilities/pharmacies procure their medicines from the same distributors as private facilities.

A national generic medicines policy promotes and enforces the prescribing and dispensing of generic medicines. Generic substitution by pharmacists is permitted. Prescribing and dispensing outside the Iranian Drug List (about 1100 chemical entities; 3750 registered products) is not permitted.

The Commission for Pricing sets the price for all medicines, as well as mark-ups or margins. Patient prices are identical in the public and private sectors. All prices are made publicly available on the website of the Ministry of Health and Medical Education. Prices of locally-manufactured products are based on the cost of manufacturing plus mark-ups and other charges in the supply chain (cost-plus). Pharmacy remuneration consists of a percentage mark-up plus a dispensing fee.

Over 85% of the population are covered by health insurance through four main insurers. Insurance covers 90% and 70% of the cost of medicines on the Insured Drug List (a subset of the IDL) for inpatients and outpatients, respectively. The reimbursed price is set at the level of the lowest priced equivalent on the market (patients must pay extra if requesting a higher priced equivalent product). The patient pays a co-payment and the pharmacy claims back the balance from the insurer. The premium for insurance coverage is shared between the employer, the employee and the government. Treatment costs for certain illnesses are fully covered by the Ministry of Health, e.g. HIV/AIDS, malaria, tuberculosis

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and routine vaccines. Certain medicines are also subsidized by the government (patients pay less than 3% of the cost).

Government hospitals may have pharmacies owned or run by the government (on a retail basis) or contracted out to private providers. They provide inpatient medicines. The price is the same regardless of the type of pharmacy. Primary health care centres stock only a limited selection of essential medicines.

Medicine price and availability survey

The survey was designed to answer the following questions:

- How efficient is the government medicine procurement system in terms of procuring low priced medicines?
- What are the differences between government procurement prices and patient prices in the public sector?
- What is the price and availability of originator brand products and generic equivalents within and across public sector medicine outlets, private retail pharmacies and private pharmacies situated in public hospitals?
- What mark-ups and duties contribute to the retail price of medicines?
- How affordable are medicines for people on low incomes?

While data was collected for 49 medicines, one was not registered in the Islamic Republic of Iran so was not included in the analysis. Of the remaining 48 medicines, 14 were from the WHO/HAI global core list and 15 from the WHO/HAI Eastern Mediterranean regional list (all with pre-set dosage forms, strengths and recommended pack sizes[3]) plus a supplementary group of 19 medicines important to prevalent health problems. Two medicines did not have MSH reference prices. All but one medicine (metronidazole 250 mg tab/cap) were on the Iran National Drug List.

Prices and availability were recorded for only four originator brand products (OB): atorvastatin, carbamazepine, digoxin and metformin. OB products of the other 44 medicines were not registered in the Islamic Republic of Iran. For all medicines, price and availability data were recorded for the lowest priced generic equivalent product (LPG) in each facility.

Data was collected from a total of 30 public sector facilities, 30 private community retail pharmacies and 30 private retail pharmacies situated in public hospitals in the capital Tehran and five provinces: Khorasan (Mashad), Yazd, Sistan va Baluchistan, Gilan and Lorestan (Table 1). Public and private sector procurement prices were obtained from a major distributor.

Presentation of price information

The WHO/HAI survey methodology presents prices in local currency and as median price ratios (MPR). The MPR is calculated by dividing the local price by an international reference price (converted to local currency). An MPR of 1 means the local price is equivalent to the reference price, whereas an MPR of 2 means the local price is twice the reference price. The international reference prices used for this survey were taken from the 2006 Management Sciences for Health (MSH) International Drug Price Indicator Guide[4] (median prices of high quality multi-source medicines offered to developing and middle-income countries by different suppliers); the use of reference prices facilitates international comparisons.

Table 1. Measurements in each sector

Measurement	Public sector	Private sector	Private pharmacies in public hospitals
Price to patient	√	√	√
Availability	√	√	√
Affordability	√	√	√
Procurement price	√	√	√
No. of facilities visited	30 public medicine outlets	30 private retail pharmacies	30 private retail pharmacies

Interpretation of findings

Country-specific factors, such as pricing policies, market size, competition and national economic and other factors may influence prices. For the purposes of these surveys, in a low-income or middle-income country an MPR of less than or equal to 1 for public sector procurement prices and public sector patient prices is considered to indicate acceptable (not excessive) prices.

Affordability

Affordability is calculated as the number of days the lowest paid unskilled government worker would have to work to pay for 1 month's treatment for medicines for chronic conditions, and a treatment course for acute conditions. In the Islamic Republic of Iran, the lowest paid unskilled government worker is on the minimum salary for all those earning a wage (whether public or private sector employees). At the time of the survey, the lowest paid unskilled government worker earned 108 400 Iranian Rials (IRR) (US$ 11.78) per day. Having to spend more than 1 day's income per month on family medicine needs could be considered to be unaffordable.

As seen in Table 2, less than 1 days' wage was needed to purchase all treatments (chronic or acute conditions) except originator brand atorvastatin which required about 8 days wages' to purchase 1 month's treatment. Should this Iranian worker need treatment for hypertension, arthritis and a peptic ulcer, then he/she would

[3] Reflecting the global burden of disease, *WHO/HAI, Medicine prices,availability, affordability and price components,* 2008.

[4] http://erc.msh.org

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Table 2. Affordability: number of days' wages to purchase treatments

Medicine		Public sector outlets	Private retail pharmacies	Private pharmacies in public hospitals
Diabetes				
Glibenclamide	LPG	< 0.1	< 0.1	< 0.1
Gliclazide	LPG	< 0.1	< 0.1	< 0.1
Metformin	OB	0.9	0.9	0.9
	LPG	0.1	0.1	0.1
Hypertension				
Amlodipine	LPG	< 0.1	< 0.1	< 0.1
Atenolol	LPG	< 0.1	< 0.1	< 0.1
Captopril	LPG	0.1	0.1	0.1
Hydrochlorothiazide	LPG	< 0.1	< 0.1	< 0.1
Lisinopril	LPG	0.2	0.2	0.2
Hyperlipidaemia				
Atorvastatin	OB	–	8.4	–
Simvastatin	LPG	0.3	0.3	0.3
	LPG	0.3	0.3	0.3
Arthritis				
Diclofenac	LPG	< 0.1	< 0.1	< 0.1
Peptic ulcer				
Omeprazole	LPG	0.2	0.2	0.2
Ranitidine	LPG	0.1	0.1	0.1
Asthma				
Beclometasone inhaler	LPG	0.3	0.3	0.3
Salbutamol inhaler	LPG	0.2	0.2	0.2
Respiratory tract infection				
Adult: Amoxicillin	LPG	0.1	0.1	0.1
Ciprofloxacin	LPG	0.1	0.1	0.1
Child: Co-trimoxazole susp.	LPG	< 0.1	< 0.1	< 0.1

Tab/cap unless otherwise stated

have to pay less than half a days' wage every month to purchase needed medicines in the public or private sector[5].

Procurement prices

Public and private sector procurement systems do not differ in Iran. The overall procurement price for the four OBs was 5.80 times the international reference price (i.e. 480% more). Overall, LPGs were 1.11 times the international reference price (i.e. 11% more). Fifty per cent (50%) of LPGs were procured at 0.8 to 1.7 times international reference prices (Table 3). Of the four medicines purchased as both OBs and generics (atorvastatin, carbamazepine, digoxin and metformin), the OBs were on average 6.4 times the price of the generics.

Table 3. Number of times more expensive: procurement prices compared to international referene prices

	Originator brand	Lowest priced generic
Median MPR *(interquartile range)*	5.80 *(5.0–6.6)*	1.11 *(0.8–1.7)*
Minimum	2.65	0.01
Maximum	9.14	4.04
No. of medicines	4	46

Table 4. Number of times more expensive: procurement prices compared to international reference prices

	Originator brand	Lowest priced generic	Ratio Originator brand: Lowest priced generic
Atorvastatin	2.65	0.09	29.4
Carbamazepine	9.14	1.01	9.0
Chloramphenicol eye drops	–	4.04	–
Digoxin	5.79	2.84	2.0
Mebendazole	–	2.43	–
Metformin	5.80	0.79	7.3
Phenytoin	–	2.70	–
Tetracycline		2.30	

Tab/cap unless otherwise stated

Table 4 presents medicines where procurement prices were high for OBs and generics, as well as price differences between the OB and generic equivalents. For example, OB and generic digoxin were 5.8 and 2.8 times the international reference price respectively and the price of OB atorvastatin was 29 times more than the price of the LPG.

Public sector patient prices

Of the four OBs surveyed, only two were found in at least four of the public sector facilities surveyed (digoxin and metformin). As shown in Table 5, they were 6.7 times the international reference price. Overall, LPGs were about 1.3 times the international reference price (interquartile range 0.9–2.0). There was negligible variation in the price of the same medicine in different pharmacies and regions; hence adherence to regulated prices is high in the Islamic Republic of Iran.

Public sector availability

Across the 48 medicines, the availability of generics in public sector facilities was 92.7%. The availability of the four OBs surveyed averaged 20% (Table 6).

[5] One antihypertensive (amlodipine, atenolol, captopril, hydrochlorothiazide or lisinopril); diclofenac for arthritis; and one ulcer healing medicine (omeprazole or ranitidine)

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Table 5. Number of times more expensive: public sector patient prices compared to international reference prices

	Originator brand	Lowest priced generic
Median MPR *(interquartile range)*	6.67	1.32 *(0.9–2.0)*
Minimum	6.66	0.01
Maximum	6.67	4.89
No. of medicines	2	45

Table 6. Availability of survey medicines in public health facilities

	Originator brand (*n* = 4)	Lowest priced generic (*n* = 48)
Mean availability *(standard deviation)*	20% *(23.3%)*	92.7% *(16.0%)*

Table 7. Availability of surveyed medicines, any product type, in public health facilities (n = 48)

Availability	Medicine
Not found	Nifedipine retard
50–60%	Albendazole
61–80%	Beclometasone inhaler, chloramphenicol eye drops
81–99%	Alendronate, amitriptyline, amoxicillin susp., biperiden, captopril, carbamazepine, cefixime susp., co-trimoxazole susp., dexamethasone inj., digoxin, fluconazole, fluoxetine, gliclazide, ibuprofen, lisinopril, mebendazole, medroxyprogesterone, metronidazole, paracetamol susp., phenobarbital, prednisolone, valproate sodium
100%	Amlodipine, amoxicillin, atenolol, atorvastatin, azithromycin, ceftriaxone inj., ciprofloxacin, diazepam, diclofenac, furosemide, glibenclamide, hydrochlorothiazide, levothyroxine, loratadine, losartan, metformin, omeprazole, phenytoin, ranitidine, salbutamol inhaler, simvastatin, tetracycline

Tab/cap unless otherwise stated

Table 7 presents the availability of any version of the surveyed medicines in the public sector facilities (nearly all were generics). Of the 48 medicines surveyed, 22 were found in all 30 outlets on the day of data collection.

Private sector patient prices

In private retail pharmacies in the community, the median price across three OBs was about 6.7 times higher than the international reference price. As shown in Table 8, across 45 lowest priced generics, the median price was about 1.3 times the international reference price (interquartile range 0.9–2.0). As in the public sector, there was negligible variation in the price of the same medicine across the private retail pharmacies surveyed.

Table 8. Number of times more expensive: patient prices in private retail pharmacies (community) compared to international reference prices

	Originator brand	Lowest priced generic
Median MPR *(interquartile range)*	6.66	1.32 *(0.9–2.0)*
Minimum	3.07	0.01
Maximum	6.67	4.89
No. of medicines	3	45

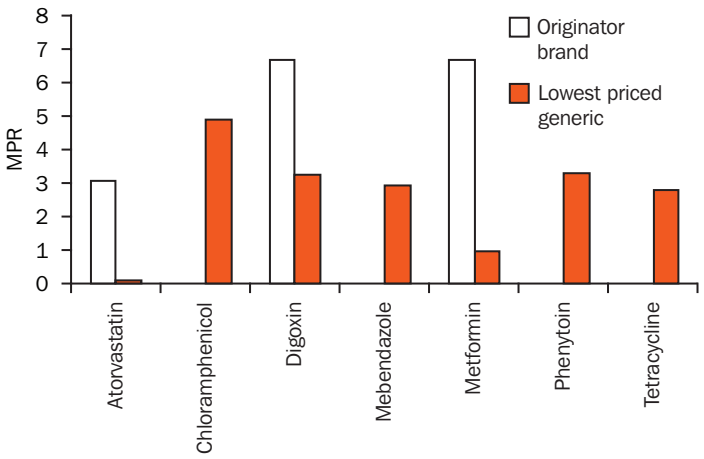

Figure 1. Number of times more expensive: patient prices in private retail pharmacies (community) compared to international reference prices

Figure 1 presents medicines with higher patient prices as well as those where both the OB and LPGs were found. OBs were 7 times the price of lowest priced generics (for the 3 medicines found in both product types).

Private sector availability

In private retail pharmacies in the community, availability across the four OBs was 35.8% while the mean availability of generics was 92.8% (Table 9).

Table 9. Availability of survey medicines in public health facilities

	Originator brand (*n* = 4)	Lowest priced generic (*n* = 48)
Mean availability *(standard deviation)*	35.8% *(30.0%)*	92.8% *(16.1%)*

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Table 10. Availability of survey medicines, any product type, in private retail pharmacies (n = 48 medicines)

Availability	Medicine
Not found	Nifedipine retard
50–60%	Albendazole
61–80%	Gliclazide, phenobarbital
81–99%	Alendronate, amitriptyline, amlodipine, amoxicillin susp., atenolol, atorvastatin, beclometasone inhaler, biperiden, captopril, ciprofloxacin,dexamethasone inj., diclofenac, digoxin, fluconazole, furosemide, ibuprofen, levothyroxine, lisinopril, loratadine, losartan, mebendazole, medroxyprogesterone, metformin, metronidazole, phenytoin, salbutamol inhaler, simvastatin, valproate sodium
100%	Amoxicillin, azithromycin, carbamazepine, cefixime susp., ceftriaxone inj., chloramphenicol eye drops, co-trimoxazole susp., diazepam, fluoxetine, glibenclamide, hydrochlorothiazide, omeprazole, paracetamol susp., prednisolone, ranitidine, tetracycline

Table 10 presents the availability of any version of the surveyed medicines in the private retail pharmacies (nearly all were generics). Of the 48 medicines surveyed, 17 were found in all 30 outlets on the day of data collection. Nifedipine retard tablets were not found in any of the surveyed pharmacies (nor in the public sector outlets surveyed) although it is on the Iran National Drug List.

Patient prices in private pharmacies located in public hospitals

Of the four OBs surveyed, only two were found in at least four of the private pharmacies surveyed that were located in public hospitals (digoxin and metformin). As shown in Table 11, they were 6.7 times higher than international reference prices. Overall, LPGs were about 1.3 times international reference prices (interquartile range 0.9–2.0). As in the other two sectors, there was negligible variation in prices of the same medicine in different pharmacies and regions. Prices in private pharmacies in public hospitals were the same as those in the community. OBs were 3 times the price of LPGs for the 2 common medicines (digoxin and metformin).

Table 11. Number of times more expensive: patient prices in private retail pharmacies in public hospitals compared to internatinal reference prices

	Originator brand	Lowest priced generic
Med. MPR *(interquartile range)*	6.67	1.32 *(0.9–2.0)*
Minimum	6.66	0.01
Maximum	6.67	4.89
No. of medicines	2	45

Table 12. Availability of survey medicines in private pharmacies in public hospitals

	Originator brand (*n* = 4)	Lowest priced generic (*n* = 48)
Mean availability *(standard deviation)*	17.5% *(22.3%)*	94.8% *(15.8%)*

Table 13. Availability of survey medicines, any product type, in private retail pharmacies in public hospitals (n = 48 medicines)

Availability	Medicine
Not found	Nifedipine retard
50–60%	Albendazole
61–80%	Lisinopril
81–99%	Alendronate, amoxicillin susp., beclometasone inhaler, biperiden, co-trimoxazole susp., diazepam, diclofenac, digoxin, fluconazole, gliclazide, levothyroxine, losartan, mebendazole, medroxyprogesterone, paracetamol susp., phenobarbital
100%	Amitriptyline, amlodipine, amoxicillin, atenolol, atorvastatin, azithromycin, captopril, carbamazepine, cefixime susp., ceftriaxone inj., chloramphenicol eye drops, ciprofloxacin, dexamethasone inj., fluoxetine, furosemide, glibenclamide, hydrochlorothiazide, ibuprofen, loratadine, metformin, metronidazole, omeprazole, phenytoin, prednisolone, ranitidine, salbutamol inhaler, simvastatin, tetracycline, valproate sodium

Tab/cap unless otherwise stated

Availability in private pharmacies located in public hospitals

In private retail pharmacies in public hospitals, the mean availability of the four OBs was 17.5%. The mean availability of generics was 94.8% (Table 12). Table 13 presents the availability of any version (nearly all generics) of the surveyed medicines in the these outlets. Of the 48 medicines surveyed, 29 were found in all 30 outlets on the day of data collection.

Intersectoral comparisons

There was no difference in patient prices across the two OBs and 45 LPGs found in the public sector, private retail pharmacies in the community and those located in public hospitals. Table 14 shows the difference between the patient price (public and private sector) and the procurement price (public and private) for medicines found in both sectors. For the two originator brands, the difference was 15%. For the 45 lowest priced generics, the difference was 21.6%.

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Table 14. Percentage difference patient price to procurement price for matched pairs of medicines, public and private sector

Medicines	Ratio
Originator brands (n = 2 matched pairs)	+ 15%
Lowest priced generics (n = 45 matched pairs)	+ 21.6%

Price components

Price components in the supply chain were measured for a selection of medicines in urban and more rural districts of Tehran. Cumulative mark-ups, excluding the fixed dispensing fee, ranged from 27% to 173% (Table 15). A dispensing fee (IRR 5000 or about US$ 0.5 at the time of the survey) is charged on each prescription regardless of the number and price of the medicines dispensed. If it were included, the cumulative mark-ups would range from 29% to 174%. In the public sector, wholesale and retail mark-ups were 10%–12% and 15%–21% respectively. Similar mark-ups applied in the private sector (wholesale 8%–13.5% and retail 12%–21%).

Table 15. Total percentage cumulative mark-ups in the supply chain excluding the dispensing fee

Medicines		Total cumulative mark-up excluding the dispensing fee
Public sector		
Generic	Locally manufactured	27–36%
	Imported	62–64%
Private sector		
Generic	Locally manufactured	36%
	Imported	63%
Originator brand	Imported	60–173%

Recommendations of the investigators

- The four main insurance organizations are responsible to ensure prices are affordable for patients. In this survey the prices of a selection of medicines were evaluated irrespective of the role of insurance in the provision of affordable medicines.
- In the price component analysis, the sample size was insufficient to make reliable recommendations.
- In the past decade some 'non-technical' barriers were imposed by the Ministry of Health on registering certain pharmaceuticals (unrelated to efficacy, safety, quality and price). For example, many OBs could not be registered because there were generic equivalents produced in the country, or in some cases a product was registered only if it could be produced locally. In recent years, a new approach has focused on reducing these barriers.
- Currently a new policy for adopting international trade rules has resulted in a gradual reduction in import tariffs (on an annual basis). This will likely increase the availability of OBs.
- In past decades, the IPI (Iran Pharmaceutical Incorporation) was responsible for the procurement of all imported medicines for both the public and private sectors. Recently, many private international companies have registered their products and supplied the market.
- Some medicines in the survey were unavailable in the pre-selected dosage form or strength due to the fact that procurement is only according to the IDL (Iran National Drug List). However, as with many other countries, the Iranian pharmaceutical market has suffered some temporary shortages which may have resulted in the lack of availability of some medicines in the survey period.

Further information

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The full survey report and data can be found at http://www.haiweb.org/medicineprices/surveys

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